ECONOMIC MOBILITY

RESEARCH & IDEAS ON STRENGTHENING FAMILIES COMMUNITIES & THE ECONOMY

Edited by the
Federal Reserve Bank of St. Louis and the
Board of Governors of the Federal Reserve System

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Federal Reserve Bank of St. Louis
1 Federal Reserve Bank Plaza
St. Louis, MO 63102

Board of Governors of the Federal Reserve System
20th Street and Constitution Avenue N.W.
Washington, D.C. 20551

Editors:
Alexandra Brown
David Buchholz
Daniel Davis
Arturo Gonzalez

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About Community Development at the Federal Reserve

The community development (CD) function within the Federal Reserve System—consisting of individual community development departments at each of the 12 Federal Reserve Banks as well as at the Board of Governors—promotes economic growth and financial stability for lower-income communities and individuals through a range of activities, including

Convening stakeholders: The function brings together practitioners from financial institutions, nonprofits, governmental agencies, and the philanthropic and private sectors to collaborate on community and economic development initiatives and to identify both key challenges and promising practices to address them.

Conducting and sharing research: The function provides policymakers and practitioners with objective analysis on the economic challenges facing lower-income communities and attendant policy and program implications. CD research is often posted online in articles and working papers and is shared both in small group settings and at larger-scale conferences.

Identifying emerging issues: The function gathers and analyzes current information on economic and financial conditions to identify emerging issues affecting lower-income communities and individuals. For example, staff regularly conduct web-based polls or surveys of individuals and organizations to help track perceptions and provide market intelligence and sentiments around a wide range of CD issues.

For more information, please visit **www.FedCommunities.org**.

FOREWORD

The Importance of Economic Mobility

JANET L. YELLEN
Board of Governors of the Federal Reserve System

This foreword is adapted from opening remarks delivered at the Federal Reserve Community Development Research Conference on April 2, 2015.

The views expressed in this article are those of the author and do not represent an endorsement by the Federal Reserve Bank of St. Louis or the Federal Reserve System.

This publication explores a topic—economic mobility—that has risen to the top of the global agenda. According to a recent Pew Research Center survey, the gap between rich and poor now ranks as a major concern in the minds of citizens around the world. In advanced economies still feeling the effects of the Great Recession, people worry that children will grow up to be worse off financially than their parents were. In the United States, roughly 80 percent of Americans across the ideological spectrum see inequality as a moderately big or very big problem.[1]

Economic inequality has long been of interest within the Federal Reserve System. In 2007, Chairman Bernanke delivered a speech on the causes of rising inequality that raised questions about the implications of this disturbing trend for economic opportunity.[2] Chairman Bernanke's speech called for more research to understand the causes and the effects of widening inequality in the United States. In 2014, I drew on the Fed's Survey of Consumer Finances—a rich source of data for researchers in this field—to explore some factors that may influence economic mobility, such as access to quality education and ownership of a family business, and I discussed how those factors may have changed over time.[3] But I noted the difficulty of reaching definitive conclusions and, like Chairman Bernanke, expressed my hope that more research would be dedicated to finding answers to these important questions.

I believe that the research and perspectives presented in this publication—as well as additional research it may in turn inspire—furthers this worthy goal. In carrying out its responsibilities, the Federal Reserve serves the public in a number of different ways, and I believe an important contribution comes via the Fed's role as a research institution. Separate from the work that directly supports the Fed's decisions on monetary policy and financial oversight, Fed economists and other researchers in Washington and at each of the 12 Reserve Banks are engaged in a broad array of independent academic

1 See Pew Research Center (2014), "Emerging and Developing Economies Much More Optimistic than Rich Countries about the Future (PDF)" (Washington: PRC, October).

2 See Ben S. Bernanke (2007), "The Level and Distribution of Economic Well-Being," speech delivered at the Greater Omaha Chamber of Commerce, Omaha, Neb., February 6.

3 See Janet L. Yellen (2014), "Perspectives on Inequality and Opportunity from the Survey of Consumer Finances," speech delivered at the Conference on Economic Opportunity and Inequality, sponsored by the Federal Reserve Bank of Boston, Boston, Mass., October 17.

research aimed at adding to the general knowledge and understanding of the economy.

Each year, Fed staff members publish hundreds of papers and others forms of research, sometimes in collaboration with scholars from universities and other institutions, all of it available for use by the research community and on view to the public.

In this Foreword, I would like to mention a few aspects of economic mobility that I think are particularly important and worthy of further research. This publication explores economic mobility as it is influenced by or affects families, communities, and the economy, and there are key research questions touching each of those three facets.

We know that families are the locus of both opportunities and barriers to economic mobility. There are important research questions to be tackled here. What individual or family characteristics may predict who will achieve upward mobility? How much does someone's initial circumstances in life influence how far that person can get or how hard he or she needs to work to get there? Researchers and policymakers need a better understanding of how much mobility individuals may experience over the course of their lives and at what age people's outcomes may become more difficult to change.

Families are the source of many of the resources and experiences that influence economic mobility, and more research can help us understand to what extent and in which ways differences in the economic circumstances of families affect the upward mobility and economic security of offspring. Research may be able to provide evidence on which public policies are most helpful in building an economy in which people are poised to get ahead. Conversely, it would also be beneficial to understand whether any policies may hold people back or discourage upward mobility.

There is some debate on how the level of economic mobility in the United States may have changed in recent decades and whether it is easier or more difficult for people to get ahead today than it was in previous generations. A range of views on this topic are contained in this publication. Looking at the very recent past, we should also be asking whether and how this may have changed coming out of the Great Recession. In a later chapter, my Federal Reserve Board colleague, Governor Brainard, addresses a topic of significant interest to me and I expect to many others—how young adults are faring in the economy and what the short- and long-term implications may have been for entering the job market at a time of significantly constrained opportunities. This is another example of how exogenous factors—those over which individuals have little or no control—may play an important role in determining how easily someone is able to improve his or her circumstances.

Communities also affect economic mobility, and here, too, more research is needed to understand how and to what extent these effects occur. Economists do not fully understand how locational differences affect economic mobility or the complex relationship between economic mobility and geographic mobility. There are community characteristics—for instance, the composition and level of local employment, schools, transportation, physical infrastructure, and community facilities—that may affect the economic mobility of the residents of that community. And there is also a community development analogue to economic mobility: Further research may help us better understand why some communities succeed or fail in generating jobs, developing successful small businesses, attracting infrastructure investment, and so on. How do some places advance economically and create circumstances in which residents, in turn, are more likely to thrive?

Finally, there are important research questions to be answered about the relationship between economic mobility and the economy as a whole. It seems obvious that greater economic opportunity and mobility promotes a healthier economy. Entrepreneurship, innovation, and hard work—surely key contributors to individual mobility—are central to a strong economy as well. But research could help us better understand how much mobility at the individual level matters for overall growth in productivity and economic output. To what extent is income mobility influenced by domestic or global economic forces, and to what extent can we promote mobility through domestic policy choices?

These are among the questions that are addressed and debated in this publication. My hope is that this spurs additional thinking, research, and action to promote upward economic mobility. ■

INTRODUCTION

Economic Mobility: An Overview

RAY BOSHARA
Federal Reserve Bank of St. Louis

DAVID BUCHHOLZ
Board of Governors of the Federal Reserve System

The authors wish to thank Mike Budzinski, Bill Emmons, Jeff Larrimore, and Logan Thomas for their thoughtful comments.

The views expressed in this article are those of the authors and do not represent an endorsement by the Federal Reserve Bank of St. Louis or the Federal Reserve System.

The concept of economic mobility—particularly of upward mobility—lies at the core of the American ethos and economy. The notion that individuals can improve their economic lot in life through hard work, education, and risk-taking is not a uniquely American one, but is broadly held in the United States as a fundamental tenet and aspiration.

Because indications are that upward mobility and economic opportunities may be more limited for some than others, the Federal Reserve System sponsored a recent research conference aimed at better understanding

- the status of economic mobility,
- how it differs across the population,
- what related factors may have changed over time, and
- potential policy directions to address concerns.

The conference brought together leading researchers and authorities to discuss and debate these issues, and this compilation presents selected findings and perspectives from participants at the event.[1] The essayists and authors represented here explore a range of issues and concepts central to understanding how, and how well, people are able to move economically today. In particular, the essayists and authors examine

- *absolute mobility*, or essentially how well individuals are faring compared to their parents' generation—did an individual have more income or wealth than their parents at a similar age?
- *relative mobility*, or how easily individuals move up or down compared to others within the same generation—did an individual move from, say, the bottom fifth of the income or wealth ladder as a child to the middle fifth as an adult?

Furthermore, and more generally, some perspectives are optimistic or describe how people are able to improve their economic situation relative to others and relative to previous generations. Still other perspectives are

1 For additional materials from the conference, see **www.stlouisfed.org/community-development/economic-mobility-conference-2015**.

cautionary and sobering, pointing out failures of opportunity and the differential ability of specific groups to get ahead relative to the overall population.

In this overview, we examine what we observe to be some of the overriding themes in this publication:

- economic mobility from an individual and family perspective
- the role of communities in fostering mobility
- the interplay between individual mobility and overall economic growth
- the nature of public policy debates that have arisen or that might be informed by research on the topic

Starting Points Matter: Individuals and Families

A key question about individual mobility is how much one's starting point in life—e.g., the education and wealth of one's parents, the moment in economic history, and/or the economic and social health of the community in which one is born—enables or constrains financial success.

There seems to be little doubt that both individual effort and starting points factor into economic mobility. But how deterministic is our starting point? Or, as Chair Yellen asks in her foreword, how much do one's "initial circumstances in life" affect how far individuals can get or how hard they need to work to get ahead? It appears, based on the research and perspectives summarized here, that these authors do not question whether starting points matter. Instead, the key questions revolve around how strongly these forces influence individuals, or how much individuals can get ahead regardless of their starting point.

This publication's discussion of individuals and families opens with a set of essays by Raj Chetty, Scott Winship, and Katherine Newman. Each offers different perspectives on the status of economic mobility in the United States—whether or not economic mobility is declining, stagnant, or improving and, indeed, what upward mobility means in the first place. By design, each essayist's perspective reflects larger debates among academics, policymakers, and others regarding trends, causes, and current prospects for upward economic mobility in the United States.

Several other authors explore the issue in this publication, including an investigation of numerous factors affecting one's starting point on the path to economic mobility. Family economic circumstances seem to be an important factor affecting an individual's economic mobility: children born into circumstances of limited financial means have more room to grow than those born into wealthy circumstances in the first place, yet might be expected to, *ceteris paribus,*

face greater challenges relative to others because of these circumstances.

Family Wealth. Among the "early" economic factors, family wealth—what a family has in savings, owns, and owes—plays a key role. Family wealth could affect, for instance, such disparate factors as ability to pay educational expenses, provide tutoring or other support when needed, pay child-care or child health-care expenses, or contribute to postsecondary education—any of which could have an influence on later outcomes.

According to Fabian Pfeffer and Alexandra Killewald, wealth inequality appears to substantially persist across generations and, in their analysis, it is not, discouragingly, counterbalanced by any meaningful wealth mobility. The degree of this "wealth inequality" influence, however, is debated and not completely understood. One way to conceptualize this debate is to look directly at the level of relative mobility over time by income.

In their essays, Chetty and Winship each explore this, though they reach somewhat different conclusions about the evidence as to how well people can move from low-income groups to high-income groups. Chetty examines how often children move from the lowest end of the income spectrum during childhood to the top end as adults, and he sees cause for concern about how easily and often that happens. Winship sees mobility concerns as well, but believes those to be more narrowly centered around issues of family structure than do other observers.

Newman, on the other hand, points out that, for many families, the issue may be less about dramatic movement from the bottom to the top and more about achieving smaller incremental gains in economic security and hanging onto such gains. She has also concluded that intergenerational "downward mobility and economic precariousness loom very large in the popular consciousness."

Race and ethnicity. Another economic mobility factor—also clearly a strong starting point factor—is race and ethnicity.

The variance in economic mobility by race and ethnicity has persisted over time, and there is little evidence it is shrinking in significant ways. There is much debate about whether this lingering and substantial disparity is an artifact of underlying economic conditions or whether it reflects other, non-economic factors. In fact, the importance of lingering effects of the disparity emerge as one of the predominant themes of contributors to this volume, discussed in some detail by, among others, Winship, Rucker Johnson, Molly Metzger, Danilo Pelletiere, and Robert Sampson. "Racial inequality," writes Sampson, "cannot be set aside in this discussion."

Generation factors. Other factors that derive from the time of one's birth also bear on economic mobility.

Neil Howe and Diana Elliott describe how one's birth year has a strong

relationship with outcomes and note that, in the aggregate, there is significant generational upward mobility disparity. They witness it in the relative affluence of today's elderly, the particular fragility of Generation X, and the observation that late Boomers are currently the last generation to have experienced a living standard greater than the generation before.

Coming of age at a time of relative prosperity and economic activity—or not—appears to have lasting influences that are presumably unrelated to individual potential and initiative. In her essay, Governor Lael Brainard explores the generations that have come of age in the years surrounding the recent Great Recession, and she discusses what the potentially long-lasting consequences of this misfortune in timing may bode for the future.

Family structure. Family structure, growing evidence suggests, is also related to economic mobility.[2]

Research from a number of scholars strongly suggests that children who grow up in single-parent households—a growing segment, particularly among parents with less than a college education—have relatively less opportunity to get ahead as adults than children raised in two-parent households.[3]

Reuben Finighan and Robert Putnam, in fact, argue that America is rapidly dividing along class lines, with roughly one-third of children being raised by married, college-educated parents, whose economic prospects are bright due to large investments of time and money. They find at least another third of children being raised by non-married, non-college-educated parents, whose economic prospects are constrained due to limited ability to invest both time and money.[4] Hannagan and Morduch note that the month-to-month income volatility is mitigated in households with two income earners.

Moreover, Chetty finds that, among the five correlates of upward economic mobility, he and his colleagues discerned that family structure looms as the strongest. Specifically, they found that the larger the *share* of single parents in a community, the lower the prospects for upward economic mobility for any one child, irrespective of the marital status of that child's parents. Newman found that changes in family composition—such as additional earnings from a child entering the workforce or another earner marrying or moving into the

2 While it is difficult to establish the pure effects of being a single-headed or married household—many social and economic factors may make it more likely that a child resides in a one- or two-parent home—and we thus cannot claim that family structure causes economic mobility outcomes, a growing body of evidence suggests that family structure is strongly correlated with economic mobility outcomes and thus merits serious consideration by researchers, policymakers, and others.

3 See, for instance, Sawhill (2014); Lerman and Wilcox (2014); and Putnam (2015).

4 Robert Pollack, in his conference paper, finds that marriage is thriving among better-educated couples precisely because it is being used as a commitment device to raise highly successful children.

household—were among the four successful routes families pursued to move up the economic ladder.

Similar findings by Winship prompted him to posit that the real mobility problem in the United States relates to profound changes in family structure over the last generation. Jeff Larrimore, Jacob Mortenson, and David Splinter, in fact, note that changes in family structure or earnings pattern—specifically marriage or an additional family member joining the workforce—account for the largest mobility gains among households whose income rises from year to year.

Recent data from the Federal Reserve's Survey of Household Economics and Decisionmaking (SHED) report also show a strong relationship between the educational attainment of parents and the earnings of their children.[5] Children who have two parents with college degrees are themselves much more likely to earn high incomes than children of parents without college degrees (Larrimore 2015).

Public policy and household balance sheet conditions. Naturally, other factors beyond the starting point affect family economic mobility. Two key topics addressed in this volume include the role of public policy and the significance of growing income and expense volatility.

Public policy can affect households' movements up and down the income ladder and affect their personal balance sheets. For instance, Larrimore, Mortenson, and Splinter find that both the Earned Income Tax Credit and progressive income taxes overall (such as the Alternative Minimum Tax) can act as income stabilizers, smoothing out consumption and thus helping families steady their financial lives.

Recent findings of increasing volatility in income and expenses among struggling families—compounded by a severe lack of emergency or liquid savings—sheds light on the challenges of holding on to existing resources, let alone moving up the economic ladder.

Disturbingly, the Federal Reserve Board's SHED finds that an unexpected expense of just $400 would prompt nearly one-half of all households to borrow funds, sell something, or simply not pay the expense at all (Federal Reserve Board 2015). Data from the Federal Reserve Board's Survey of Consumer Finances (2013) show that the top savings priority for American families is emergency or liquid savings, yet only about one-half of this group actually has such savings.

Income volatility appears as an issue that may have significant implications for many households. Using tax data, Larrimore, Mortenson, and Splinter find relatively frequent income swings, both up and down, among tax filers. Anthony Hannagan and Jonathan Morduch describe an interesting, though

5 More information on SHED can be found on the Federal Reserve Board's website at: **www.federalreserve.gov/communitydev/shed.htm**.

not representative, study of low- and moderate-income households tracked through the U.S. Financial Diaries project.

The study found that the tracked families experienced sizable income swings, on average, both up and down from month to month: in a given year, the families averaged about two-and-a-half months in which their incomes spiked more than 25 percent from their average, and about the same number of months in which their incomes dropped by more than 25 percent. Those families below the poverty line experienced especially acute volatility.

This phenomenon may be particularly problematic for households if spikes in income do not move in tandem with spikes in expenses. In fact, Hannagan and Morduch (and Newman) remark that managing volatility and scarcity have become a way of life for many American families. (Meta Brown and Matthew Mazewski note that access to unsecured credit may provide opportunities to mitigate such volatility.) Such findings help explain why the Financial Diaries project, echoing research by the Pew Charitable Trusts (2015), report that an overwhelming majority of families value financial stability over upward mobility or, at least, see stability as a prerequisite to mobility.

While the papers discussed here suggest that starting points, public policy, and balance sheet items matter, families do not exist or strive for financial success in isolation; they are embedded in a community, a place, which also has an effect on their prospects for upward economic mobility.

Place Matters: The Role of Communities and Other Nexus Points

As some of the other contributors explore, economic mobility also appears to be related to place—the neighborhood, community, schools, employers, places of worship, unions, and other institutions an individual encounters in youth and adulthood.

A powerful and recurring theme from the research presented in this publication is the role that communities play in affecting the prospect of economic mobility. Chair Yellen notes that economists do not fully understand how locational differences affect economic mobility or, for that matter, the complex relationship between economic mobility and geographic mobility.

Many variables may be at play, such as strength and number of community institutions, the degree of economic and racial diversity, the quality of financial services and other critical factors that may advance or impede a child's ability to develop and grow, or access resources and employment opportunities. As Sampson puts it, we may gain a fuller understanding by focusing on "contextual" mobility, not just individual mobility.

Metropolitan areas. Among the more striking findings from Chetty, Newman, and others is the *extent* to which place or context is associated with mobility. Chetty looks at the likelihood of a child raised in the bottom 20 percent making it to the top quintile as an adult. In some U.S. metropolitan areas, the odds are more than 17 percent, while those same odds in other U.S. metropolitan areas are below 5 percent.

And just as remarkable is how much economic mobility rates vary *within* individual metropolitan areas. The Washington, D.C., metropolitan area, for example, has a relatively high—11 percent—overall upward mobility rate. But this masks intraregional variation: it reaches only 4.7 percent in the District of Columbia proper and soars to 14.2 percent in Charles County, Maryland. Newman, too, observes enormous variations in poverty, mortality, teen pregnancy, and high school drop-out rates in areas with regressive taxation regimes.[6] Further research, it seems, could serve to better understand these complex dynamics.

Resource-rich locales and related dynamics. If better neighborhoods matter for mobility, then families living in areas with relatively few resources could presumably increase their lot in one of two ways—if that area improves or if they move to a better neighborhood.

Evidence presented here suggests that both routes can work, though there are no simple policy prescriptions for either place-based or people-based interventions, including the fact that there are limits on how many people can be moved to higher-income areas or better schools. Chetty, Nathaniel Hendren, and Lawrence Katz, based on their re-evaluation of the Moving to Opportunity Project, find evidence that moving to low-poverty census tracts at a young age has substantial influences on children's long-term success (Chetty, Hendren, and Katz 2015). Metzger and Pelletiere, in their paper, find that vouchers are at least somewhat successful in helping residents reach higher-income neighborhoods, although the effect of vouchers at achieving racial and ethnic diversity are more limited. And Sampson explores the interrelationship between individual mobility and community conditions, including significant variation by race, and calls for a greater understanding of "contextual mobility" and for policy considerations that "take the long view" and allow low-income individuals to increase their resources without needing to physically move.

6 Jonathan Rothbaum, however, in a presentation at the conference, cautioned that place may not matter as much as Chetty and others suggest. He finds the local characteristics that are highly correlated with mobility (such as share of single parents, income inequality, and social capital) are not predictive of mobility after controlling for race, parental education, and family type (whether single or teen parenthood). See **www.stlouisfed.org/community-development/economic-mobility-conference-2015**.

Other authors explore what effects an improvement in a neighborhood may have on its residents. Todd Swanstrom, Hank Webber, and Molly Metzger find that some low-income and minority residents of improving neighborhoods do benefit from those improving conditions. They call for comprehensive policy approaches to address distressed neighborhoods. Brown and Mazewski find that regional variations in credit scores, access to credit, types of debt and other consumer debt measures "map" well with Chetty's observed economic mobility outcomes, suggesting that regional differences in financial services could also affect economic mobility. However, the challenges involved in improving existing communities are steep.

Economic segregation. Finighan and Putnam argue that growing economic segregation magnifies inequality by concentrating poor families in places that have fewer job opportunities, fewer trusting neighbors, and fewer community institutions. Sampson observes that there appears to be a "path dependence of living in neighborhood poverty" and that blacks living in some poor neighborhoods pay a "significant racial penalty."

Perhaps most troubling, however, in efforts to revitalize struggling communities, are trends in concentrated poverty which, as Sampson and Patrick Sharkey (2008) have shown, is significantly associated with crime, social mobility, and other outcomes for residents of those communities.

The U.S. Census reports that the number of people living in concentrated poverty rose by about 56 percent between 2000 and 2010, a time period during which the overall population rose by only about 10 percent. This increase reversed prior trends in the opposite direction and returned the country to previous peak levels of concentrated poverty (Bishaw 2014). Paul Jargowsky (2015), explores the racial and ethnic dimensions of this troubling trend: of lower-income individuals, one in four blacks, and one in six Hispanics, live in areas of high poverty, compared to only one in 13 lower-income whites.

Sampson, in fact, observes that the racial "penalties" are too large and persistent not to be addressed head-on. He also points out that high-income blacks are more likely to live in areas with high poverty levels than are low-income whites, and calls for an "affirmative action" not just for individuals, but neighborhoods as well.

Education availability and quality, and related class dynamics. Other research, including recent research from the Federal Reserve Bank of St. Louis (Boshara, Emmons, and Noeth 2015), finds that the racial wealth gaps remain large—non-whites have, on average, 10 percent of the wealth of whites—and largely unchanged over recent decades despite much civil, economic, and political change during that time. Even when comparing whites and non-whites with similar education levels, the racial wealth gap remains large, suggesting that education alone may not erase the gap.

Indeed, race is related to another dynamic connected to economic mobility: schools and school quality. Several authors explore the ways in which the quality of educational institutions may matter for economic mobility. Johnson looks at school desegregation, school finance reform, and Head Start, and finds what he considers robust and compelling evidence that educational spending in these areas matters for improving outcomes, including large effects on low-income children. Additionally, he observes that these programs have valuable cumulative effects, as the combined benefits from school spending increases and Head Start exceed the sum of the independent effects of these programs.

Johnson, as well as Finighan and Putnam, stress how important family background is—that children enter elementary school with much relative advantage or disadvantage already and that growing class segregation (over the last 30 to 40 years) is magnifying educational segregation and disparities. However, both stress that improved school quality can help ameliorate the performance of those from disadvantaged backgrounds. That is, schools may not be part of the problem, but can be an important part of the solution.

Access to higher education plays a key role, too: Newman finds that "firm hopping" after accruing more education (including, surprisingly, after age 25) was a key route for some to move out of poverty and into the middle class.

Labor unions. Workplace labor unions are another institution that may affect mobility. Richard Freeman, Eunice Han, David Madland, and Brendan Duke maintain that unions have been important contributors to higher incomes and upward mobility among low-wage workers and their offspring.

They find positive associations between union affiliation and incomes of both workers and their offspring, and conclude that the decline in union membership in recent years implies a decrease in the size of the middle class and of the ability of workers to convey economic benefits to their offspring.

The Macro-Economy Matters: Opportunity and Growth

Other authors in this volume explore the complex relationship between employment and economic mobility prospects of workers and the strength or weakness of the economy overall.

Mobility, inequality, and macroeconomic dynamics. The effects that economic mobility—and related factors such as inequality—have on the broader economy, and vice versa, have been the subject of debate for years. As Chair Yellen notes in her foreword, "it seems obvious that greater economic opportunity and mobility promotes a healthier economy." The extent of this

relationship, and the extent to which inequality may matter for both economic opportunity and economic growth, are topics explored by several authors.

The well-documented rise in income and wealth inequality over the last few decades has been matched by a constructive rise in scholarly, media, and public attention. While there is recognition about the importance of this issue across the political spectrum, there is not agreement on how problematic this income and wealth divide may be.

Some argue that the ability to climb the economic ladder is more important than the actual inequality and that, in fact, relative inequality has long been a motivator to incentivize working hard to get ahead. From this perspective, evidence that economic mobility could be stagnating might be even more concerning than similar evidence of inequality.

Others attempt to demonstrate a strong relationship between inequality and opportunity. Outside this volume, Jared Bernstein and Ben Spielberg (2015) argue that rising inequality necessarily means fewer resources for lower-income families to make mobility-enhancing investments. They argue that inequality, *inter alia*, "is driving increasing residential segregation by income," leading to unequal access to education, and eroding economic opportunity by limiting access to a variety of "enrichment goods" such as social networks.

In this volume, Winship cautions that, in his view, we should not conflate growing inequality with declining mobility: "A country can have high (and rising) inequality without economic mobility being worse. If American CEOs earn much more than fast-food workers, that does not necessarily mean that it is more difficult in the United States than in other countries for the daughter of a fast-food worker to become a CEO." The real mobility issue for Winship, as noted, is change in family structure, not rising inequality. Chetty, while not addressing this macroeconomic issue specifically, did find that *regional* inequality is one of the five strongest correlates of mobility: the higher regional inequality, the lower the rate of upward economic mobility.

Inequality of opportunity and effort. Another question addressed in this volume is the effect of inequality on the nation's economic performance. Gustavo Marrero and Juan Gabriel Rodriguez find that the literature, overall, is ambiguous because total inequality includes two components of inequality that, working simultaneously, could have opposing effects on economic growth.

The first component is inequality of opportunity, which is due to factors beyond one's control—such as one's parents, race, or time and place of birth. Inequality of opportunity, in their view, is unfair and "always" harms economic growth. The second component is inequality of effort, which relates to choices over which people do have control. They view this kind of inequality as fair and also show that inequality of effort has an ambiguous relationship to economic growth.

While it is important to understand what type of inequality is affecting economic growth, they argue that policy should focus on the more problematic and unfair type of inequality—inequality of opportunity—which can be addressed through affirmative action, lowering constraints in credit markets to students and entrepreneurs, and improving public education and public health.

Human capital accumulation and development. The accumulation of "human capital" is noted as (1) an important component of one's ability to get ahead and, as Eric Hanushek and Ludger Woessmann argue, (2) an equally important contributor to the overall economy. They argue that, if overall improvements in basic skills and other components of human capital were realized, the influence on overall economic health would be significant.

One implication is that, to the extent that schools and other contributors to skill development are lacking in certain areas or for certain portions of the population, the overall economy may not be as robust as it could otherwise be.

Public Policy Matters: How Proactive a Role?

Policymaking institutions and bodies both influence—and are influenced by—the ease with which citizens can be economically mobile.

In his essay, Joseph Stiglitz points out the influence that central banks—in the United States, the Federal Reserve specifically—have on economic mobility and inequality. He argues that central banks ought to care about inequality "both because of how it affects overall economic performance and because it affects the well-being of ordinary citizens," and calls for a rethinking of monetary policy to reflect such concern.

In that vein, a number of public policy questions emerge and interweave with themes found in the essays and papers in this volume.

Public Policy and Individual and Family Starting Points

First, to the extent that the circumstances associated with one's birth appear to increasingly matter for realizing upward economic mobility, in what manner should public policy attempt to "compensate" for this?

Much of the research in this volume suggests that factors beyond one's control play heavily into how easy or difficult it is to get ahead. If this is true, an implicit question is whether public policy should play a more proactive role in attempting to provide more opportunities, resources, and investment or otherwise make it more likely that individual effort and risk-taking lead to success.

Several policy ideas seem aimed broadly at just this goal. Some authors, including Finighan and Putnam, as well as Larrimore, Mortenson, and Splinter, discuss the role that tax credits can play in increasing net income

among lower-income families, which could in turn ameliorate the troubling financial volatility documented by Hannagan and Morduch. Sampson even discusses the idea of offering cash assistance or tax breaks to those who live in historically disinvested places as a way to compensate them for the disadvantages those places seem to impose on their residents' ability to get ahead.

Policy prescriptions designed to advance this goal should, of course, first define success, since the policy levers may be different depending on the ambition of the policy intervention. Should policy, as Chetty's research implies, aim to enable more children to be able to move from the bottom quintile as children to the top quintile as adults, or should policy, as Newman argues, principally aim to help more struggling families simply achieve and consolidate modest gains?

Public Policy and Communities

Another clear thread running through much of the work in this volume with policy implications is the extent to which place or context seems to matter for the economic mobility prospects of families. Many community- or place-based factors appear to matter: the level of economic and racial integration, quality of schools, prevalence of single families, networks and social capital, and the quality of other institutions such as churches and service organizations. And whether policy aims to improve existing neighborhoods or incentivize families to move to better neighborhoods—a distinction discussed by Sampson and others—it appears that the earlier a child is exposed to better neighborhoods and stable family circumstances, the greater the likelihood of upward mobility.

The overall quality of one's surroundings and infrastructure also appears to be important and have long-lasting effects throughout life. Finighan and Putnam discuss the effect of children growing up in lower income neighborhoods with fewer resources, and the improvements that could be brought to bear by improving their surroundings through public policy. That said, there is not uniform agreement on what the most effective policy levers may be to effect these kinds of place-based improvements. Sampson argues that neighborhood improvement needs to include durable investments that are made with holistic, long-term views. Swanstrom, Webber, and Metzger cite a number of policy levers—from the Low-Income Housing Tax Credits to neighborhood "public health" approaches—that they think should be used differentially depending on the condition and trajectory of the specific neighborhood.

Quality of education, which of course varies by place, is another specific and recurring theme that has clear policy implications. Johnson makes a compelling

case that past policy interventions in how education was conducted and funded led to measurable improvements in economic mobility for African-Americans. Finighan and Putnam argue for improvement in education, from universal early childhood education all the way through apprenticeship programs and improved community colleges. And Hanushek and Woessmann argue straightforwardly that making significant improvements in the funding and delivery of the education system would lead to concomitant increases in economic mobility and national economic performance.

Another troubling theme that has policy implications is the depth and persistence of racial inequality among families and communities, and its pernicious effects on economic mobility. Many of the policy issues already discussed touch on race and ethnicity, but it is worth considering, specifically, what role public policy may have in attempting to improve the economic prospects of minority families and communities. Metzger and Pelletiere, for instance, take on the conundrum of continuing racial concentration even among HUD Section 8 voucher holders, who ought to be able to achieve geographic mobility but largely do not, and describe a number of specific policy levers that could be used to bring about less segregated outcomes. And Sampson makes a call for "affirmative action" for highly impoverished, segregated neighborhoods, rather than just for individuals, as a policy response.

Public Policy and the Macro-Economy

Finally, Hanushek and Woessmann raise the question of what role policy should play in improving the institutions and ideas that contributed to the upward mobility of millions over several generations. These include superior economic institutions, early commitment to human capital, excellent colleges and universities, and the benefits of a tradition of immigration. Many of these advantages, they note, are "likely to go away as many other countries have made great strides in emulating and even surpassing these strengths of the United States." But those advantages will not disappear immediately, they note, and accordingly argue that the effects on gross domestic product and upward mobility of reclaiming these advantages could be quite large.

In Summary: The Case for Optimism or Pessimism

By and large, Americans themselves are optimistic about their ability to get ahead, and the ability of the next generation to do the same.

Two Perspectives

In the Federal Reserve Board's SHED report, respondents are asked how they perceive themselves financially compared with their parents at the same age. A little over half of respondents say they're better off, while a little under a quarter say they're worse off. Notably, respondents under 30 are somewhat less optimistic than others.

Looking into the future, many people are similarly optimistic, though somewhat less so. When asked if their children, or family members in the next generation behind them, will be better off than they are, 44 percent expect them to be, while 28 percent expect them to be worse off. Interestingly, respondents who have children under 18 in their household are somewhat more optimistic than others.

But who will actually turn out to be right, the optimists or the pessimists?

Reasons for Optimism

Given the historically high levels of income and wealth inequality, coupled with the U.S.'s fiscal, political, and demographic challenges, maintaining or improving our rates of upward economic mobility could prove to be difficult.

Yet, on the whole, we remain optimistic for a few reasons:

1. **Understanding of mobility drivers.** We now better understand the drivers of mobility at all levels than we have in the past, which can provide a basis for policy actions.
2. **Zero-sum games applicability.** As Chetty demonstrates in his essay, economic mobility does not have to be a zero-sum game: improving the mobility prospects of lower-income children can increase the size of the economic pie, which benefits everyone.
3. **The seeds of innovation and experimentation.** Given the highly localized nature of economic mobility—how much place matters—there is ample room for innovation and experimentation to see what works. Promising ideas can be tested at state and local levels with the most successful ones expanded nationally, as has happened throughout U.S. history.
4. **A re-imagining of the mobility definition.** And finally, as Howe and Elliott keenly observe, the notion of the American Dream is not fixed, but is in fact re-imagined by every generation. What moving up in America may mean to one generation may not mean the same to another, challenging all of us to define and achieve success in novel and ever-changing ways.

Throughout this publication, the authors explore a range of issues and questions pertaining to economic mobility. Readers can decide for themselves whether signs of hopefulness trump areas of concern, as well as the appropriate role for public policy. Indeed, through this publication, and the conference spawning it, the Federal Reserve hopes to shed light on this important and complex topic. ■

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SECTION 1

Perspectives on Economic Mobility

Improving Opportunities for Economic Mobility: New Evidence and Policy Lessons

RAJ CHETTY
Stanford University

The views expressed in this article are those of the author and do not represent an endorsement by the Federal Reserve Bank of St. Louis or the Federal Reserve System.

The American Dream is a complicated concept, but I'd like to distill it down to a simple statistic that we are able to measure with data: the probability that a child born to parents in the bottom fifth of the income distribution makes the leap all the way to the top fifth of the income distribution.

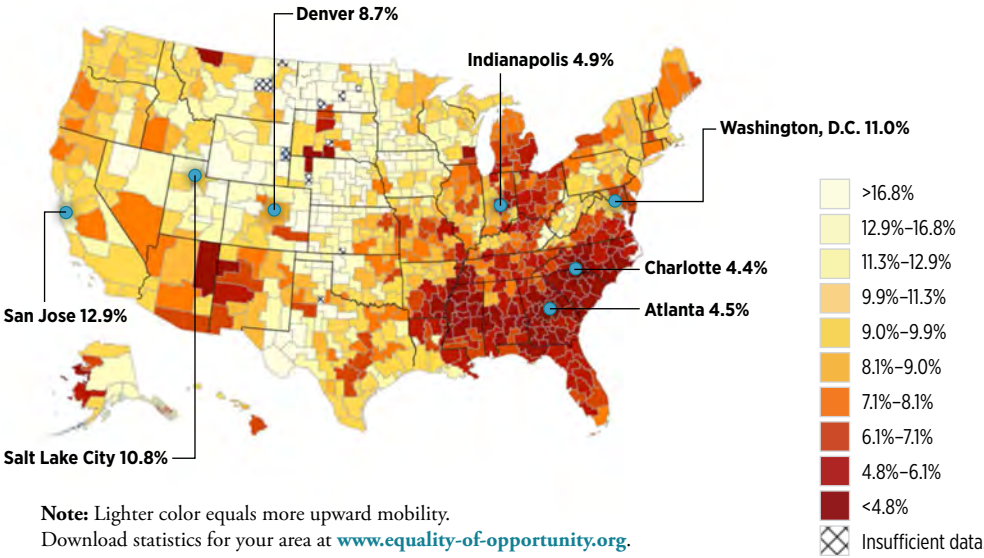
In the United States, children born to parents in the bottom fifth of the income distribution have a 7.5 percent chance of reaching the top fifth. That compares with about 9.0 percent in the United Kingdom, 11.7 percent in Denmark, and 13.5 percent in Canada. When some people initially see these numbers, they sometimes react by saying, "Even in Canada, which has the highest rates of upward mobility, the rate of success doesn't look all that high. You only have a 13.5 percent chance of reaching the top if you start out at the bottom." It is important to remember that, unfortunately, no matter what you do, you can't have more than 20 percent of people in the top 20 percent. As such, these differences are actually quite large. One way to think about it is this: your chances of achieving the "American Dream" are almost two times higher if you're growing up in Canada relative to the United States.

These differences across countries have been the focus of much policy discussion. But what should also be given attention is that upward mobility actually varies substantially even within the United States. In recent work, my colleagues and I calculate upward mobility for every metro and rural area in the United States using anonymous earnings records on 40 million children and their parents (Chetty et al. 2014).

What results from that analysis is a map (figure 1) that shows the geography of intergenerational mobility in the United States. In this map, we're computing the same statistic mentioned previously: your chances of reaching the top fifth of the national income distribution conditional on starting in the bottom fifth for 741 metro and rural areas in the United States.

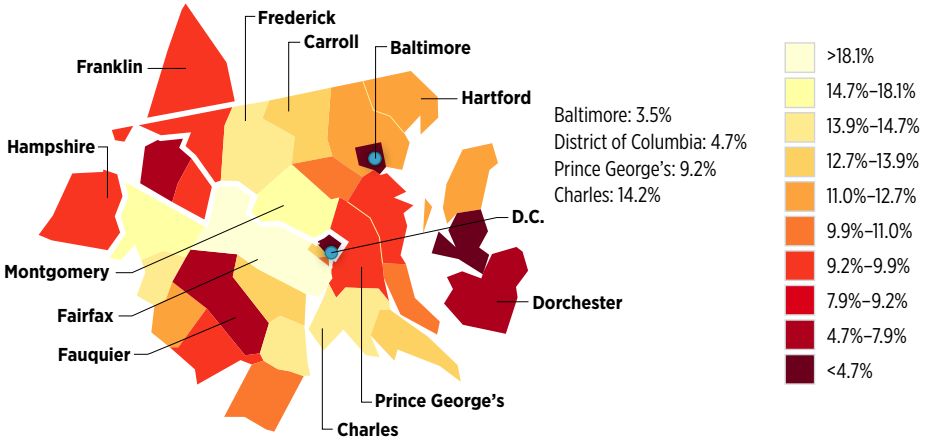
What you can see in this map is that there is substantial variation in the United States. For places in the top decile—the lightest colored places on this map—your odds of reaching the top fifth conditional on starting in the bottom fifth exceed 16.8 percent, higher than the numbers we saw for Denmark and Canada. In contrast, at the other end of the spectrum—the darkest red colors—in the southeastern United States for instance, that number is lower than 4.8 percent, which is lower than any developed country for which we currently have data. To provide an example, if you're growing up in San Jose,

Figure 1. The geography of upward mobility in the United States: odds of reaching the top fifth starting from the bottom fifth



Note: Lighter color equals more upward mobility.
Download statistics for your area at **www.equality-of-opportunity.org**.

Figure 2. The geography of upward mobility in the Washington metro area: odds of reaching the top fifth starting from the bottom fifth by county



your odds of moving up the income ladder are three times as high as if you're growing up in a place like Charlotte or Atlanta or Indianapolis.

What's even more striking in some ways is that a lot of this variation is extremely local. While in this map you initially see the broad regional variation, let's take the case of the Washington, D.C. metro area, which on average has an 11 percent rate of upward mobility, and look now at the data by county (figure 2).

You can see that if you're growing up in the city of Baltimore, you unfortunately have only a 3.5 percent chance of making that leap from the bottom fifth to the top fifth. That compares with 4.7 percent in D.C. If you go to some of the more suburban counties, you see much higher rates of upward mobility: Prince George's County, 9.2 percent, Charles County, 14.2 percent. This illustrates that even in areas that are quite near each other, you see substantial differences in rates of social mobility in the United States.

Now, naturally the question of interest both to academics and policymakers is why does upward mobility differ so much across areas and, ultimately, what can we do about it? The first clues for us as researchers came from the fact that this spatial variation emerges at very early ages. In high mobility areas like Salt Lake City or San Jose, children from low-income families are more likely to attend college, and they're less likely to have a teenage pregnancy. By the time they're 16, 17, or 18 years old, a lot of these patterns have already emerged. The reason that's important is that it points to factors that affect children not just once they're in the labor market but before they start working. It suggests that childhood environment could be extremely important here.

Further evidence for that view comes from families who move across areas. In recent work, my colleague Nathan Hendren and I looked at families who move across areas to document the importance of childhood environment (Chetty and Hendren 2015). The first thing we show is that there is clear evidence of childhood exposure effects. Moving to an area of higher upward mobility at a younger age increases children's earnings in adulthood.

What's particularly fascinating about this data is comparing siblings within the same family. Take a family that moves from D.C. to Prince George's County with two kids. We find that the child who was younger at the point of the move to the better area—the area with higher rates of mobility—ends up doing better as an adult. For example, if you move with a 5-year-old and a 10-year-old, we see that the 5-year-old is doing better than the 10-year-old in proportion exactly to that 5-year age gap, because that 5-year-old has an extra five years of exposure to the better environment. We find very clear evidence of linear childhood exposure effects, suggesting that each year in a better childhood environment really matters.

Further evidence for the importance of childhood exposure comes from the Moving to Opportunity experiment. In a reanalysis of data from that experiment, my colleagues and I found that moving to low-poverty census tracts at a young age has substantial impacts on children's long-term success (Chetty, Hendren, and Katz 2015). It increases their earnings in adulthood by 30 percent, makes them more likely to go to college, and so forth.

What is it that places like Salt Lake City or San Jose are doing to generate such high levels of upward mobility? Or at a more local level, Charles County versus the City of Baltimore—what are the differences in the characteristics of these places? We've looked at several factors and identified five strong correlates of upward mobility.

The first is the degree of segregation in an area: more mixed-income communities tend to produce better outcomes for kids from disadvantaged backgrounds. The second is income inequality: areas with less income inequality tend to have higher rates of upward mobility. The third and fourth factors come from the sociology literature. We find that areas with more stable family structures—in particular, areas with fewer single parents—have substantially higher rates of upward mobility. Areas that are more socially cohesive, with large amounts of social capital, also have much higher rates of social mobility. Finally, as you might expect, areas with better public schools tend to have much higher rates of upward mobility.

Lastly, I want to provide a different perspective on why we should be interested in social mobility. The traditional argument for greater social mobility is based on principles of justice, the principle of the equality of opportunity. But improving opportunities for upward mobility can also increase the size of the economic pie, coming back to a point that Federal Reserve Board Chair Janet Yellen made in her introductory remarks (2015).

In ongoing work we are studying the lives of inventors—measured using patent records—in the United States. We find that a child's probability of becoming an inventor is strongly related to his or her parents' income: children from rich families are 10 times as likely to become inventors as those from lower-income families. Further examination of these data suggests that a large portion of this innovation gap can, once again, be attributed to differences in childhood environment and exposure between low- and high-income families. These results imply that improving opportunities for social mobility could ultimately increase the rate of innovation in the economy and thereby benefit *everyone,* not just disadvantaged children. Hence, increasing mobility is of interest not just from the perspective of justice but also from the perspective of economic growth.

Let me conclude by briefly summarizing a couple of policy lessons. First, it's critical to tackle social mobility at a local and not just a national level.

Let's focus on specific cities such as Atlanta or Baltimore and on neighborhoods within those cities. Second, the childhood environment seems particularly important. Improve neighborhoods and schools; jobs certainly matter, but ladders to opportunities start before children begin to work. Third, and most broadly, as I hope I've illustrated, harnessing big data to evaluate policies scientifically and measuring local progress and performance can be incredibly valuable. ■

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The State of Economic Mobility and Why It Matters

SCOTT WINSHIP
Manhattan Institute

The views expressed in this article are those of the author and do not represent an endorsement by the Federal Reserve Bank of St. Louis or the Federal Reserve System.

There is a growing consensus that the United States has insufficient levels of economic mobility. However, the way we characterize the problem matters greatly because it will determine the policies we pursue to address low mobility. I would argue that the latest evidence indicates the problem is narrower than the conventional wisdom suggests. That does not mean that we need not worry about economic mobility, but it does suggest that expansive, expensive, and overly interventionist policies that presume a broader problem may be ill-suited to solving the specific challenges the United States faces.

The idea that the United States has worse economic mobility than our peers in Europe and the English-speaking world has become accepted as fact. What was a relatively inaccessible conclusion from the academic literature gained popular attention with the introduction of "The Great Gatsby Curve" in early 2012 by Alan Krueger, then chair of the President's Council of Economic Advisors.[1] The curve is a chart that looks at different countries and plots their levels of inequality on the X-axis and their level of immobility on the Y-axis. It shows a strong correlation between inequality levels and economic immobility, with the United States firmly in the corner of high inequality and high immobility.

However, the Great Gatsby Curve, like most of the research on which it is based, uses a measure of "immobility" that indicates less mobility when income inequality grows between generations of parents and children. It is important to distinguish between these two concepts.

When most researchers and practitioners talk about "equality of opportunity," they are talking about whether someone who starts at the bottom of the income distribution has an equal chance of reaching the top of the distribution as someone who starts out at the top of the distribution. Since inequality has risen more in the United States than in other nations, our "immobility" looks relatively bad. But a country can have high (and rising) inequality without economic mobility being worse. If American CEOs earn much more than fast-food workers, that does not necessarily mean that it is more difficult in the

1 This term was coined in a 2012 speech given by Krueger at the Center for American Progress (see **www.whitehouse.gov/sites/default/files/krueger_cap_speech_final_remarks.pdf**), based upon work by Miles Corak (see **https://milescorak.files.wordpress.com/2012/01/inequality-from-generation-to-generation-the-united-states-in-comparison-v3.pdf**).

United States than in other countries for the daughter of a fast-food worker to become a CEO. The "mobility" measures that we have used in the past to compare countries have conflated these two issues.

However, a recent paper by Miles Corak, Matthew Lindquist, and Bhashkar Mazumder at the Federal Reserve Bank of Chicago carefully compared the mobility levels of the United States, Canada, and Sweden (2014). They took great care to make the country-specific analyses comparable to each other, and they utilized a mobility measure that is not affected by changes in inequality. Remarkably, they found that these three countries have essentially the same levels of upward mobility from the bottom of the income distribution.

This result, if it holds up, would overturn more than two decades of research, including a widely cited paper by Markus Jäntti and his colleagues that showed the United States with worse mobility than the Scandinavian countries (2006). Figure 1 shows the percentage of sons growing up in the bottom fifth of paternal earnings who remain in the bottom fifth of male earnings as adults. The Scandinavian figures are taken from the Jäntti paper, which showed the corresponding figure much higher in the United States—40 percent versus the 25 to 28 percent for the Scandinavian countries.

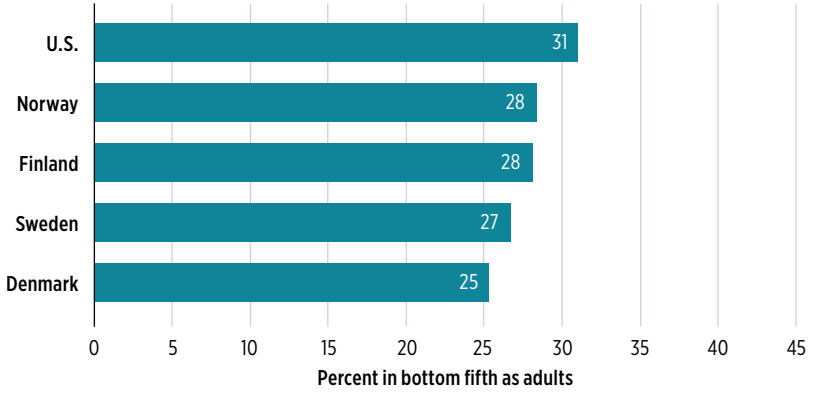
But the Jäntti paper compared American sons' earnings to their parental family income rather than their paternal earnings. Figure 1 replaces the paper's American estimate with one from a recent report from the Pew Charitable Trusts that compared father and son earnings (2012). Instead of 40 percent of sons raised in the bottom remaining there, 31 percent do, which is substantially closer to the other countries. When this result is combined with the finding in the paper by Corak, Lindquist, and Mazumder (2014) that Sweden and the United States have the same upward mobility, the implication is that only Denmark's mobility levels are better than ours.

And given that Scandinavian countries have some of the highest mobility rates, the U.S. rates are probably comparable to other non-Scandinavian countries. Raj Chetty's comparison of data from Canada and the United States appears to contradict the Corak et al. result, but he, too, is contrasting an American estimate using parental family income with an estimate (for Canada) using paternal earnings. There is also evidence suggesting that mobility rates in Germany are comparable to American rates (Schnitzlein 2015).

Figure 2 presents similar results for downward mobility rates from the middle fifth of the income distribution. The differences between the United States and these other countries are even smaller than they are for upward mobility rates from the bottom.

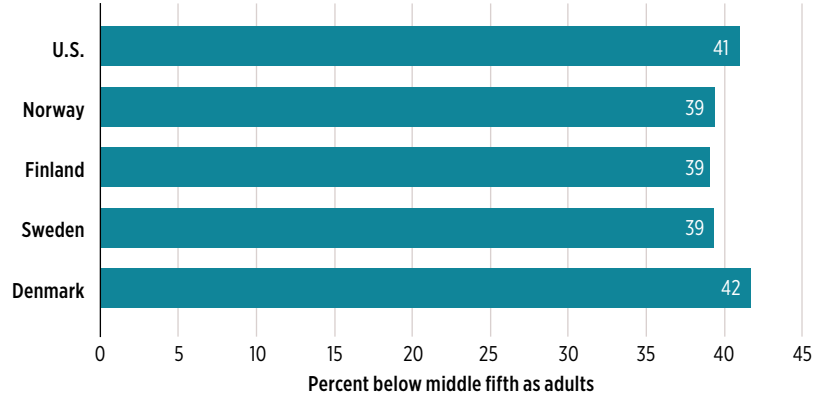
If American mobility rates are not substantially worse than in other countries, perhaps they are worse than in the past? Here popular misperception

Figure 1. Upward earnings immobility of sons with father earnings in bottom fifth



Source: For Scandinavian countries, Jäntti et al. (2006); for United States, Pew Economic Mobility Project (2013).

Figure 2. Downward earnings mobility of sons with father earnings in middle fifth



Source: For Scandinavian countries, Jäntti et al. (2006); for United States, Pew Economic Mobility Project (2013).

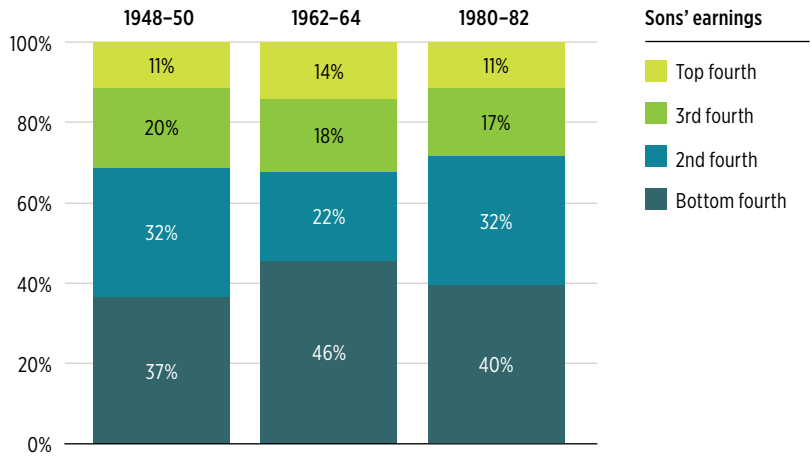
runs up against a fairly consistent academic literature finding only small changes in mobility over the past 50 years. The recent paper by Chetty et al. on mobility trends using tax data reinforced this consensus (2014).

My own research, extending to cohorts of sons born as recently as the early 1980s, yields the same conclusion (Winship, forthcoming). Figure 3 shows three cohorts of men: those born in the late 1940s, the early 1960s, and the early 1980s. The figure displays where sons growing up in the bottom fourth of parental income ended up in terms of their own earnings.

Previous studies using the same datasets compared the first two cohorts and found the same decline in upward mobility that I show (Levine and Mazumder 2002; Bloome and Western 2011). A son born in the 1940s into the bottom of the distribution had a 37 percent chance of remaining in the bottom. By the early 1960s, the same group had a 46 percent chance of remaining in the bottom fourth. However, as we look at figures for those born in the 1980s, these numbers fall close to the 1940s level. None of these differences are statistically meaningful. Over time in the United States, mobility has not fallen. A similar figure for downward mobility from the middle shows cohort mobility levels that are virtually identical across birth cohorts (figure 4) (Winship, forthcoming).

These are important findings: as inequality has grown in the United States,

Figure 3. Percent of sons growing up in bottom fourth of parental income in different fourths of the earnings distribution, by birth year



Source: National Longitudinal Surveys estimates and Winship (forthcoming).

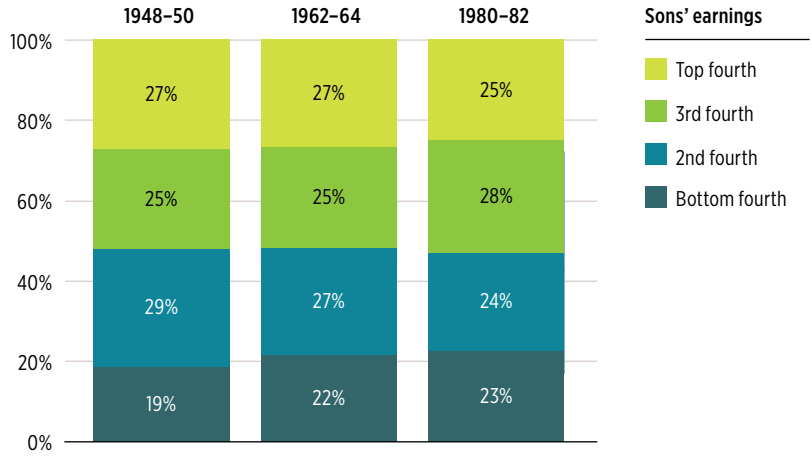
mobility has not fallen; while the United States is a high-inequality country, it does not appear that the differences in mobility are very notable compared to low-inequality countries.

So what is the real problem with mobility in the United States? Figures 5 and 6 are derived from the National Longitudinal Survey of Youth, a survey that continues to follow men and women born in the late 1950s and early 1960s. Figure 5 shows the percentage of sons and daughters raised in the bottom fifth of family income who remain in the bottom fifth of family income or earnings as adults. The blue bars are for the country as a whole, while the others are broken down by race.

If there were perfect mobility, 20 percent of the people who start in the bottom would remain in the bottom. For men, there is a dramatic racial difference in upward mobility from the bottom. Among whites, 25 percent of men starting at the bottom have earnings that put them in the bottom of the male distribution—nearly perfect mobility. Among black men, however, 48 percent remain stuck in the bottom.

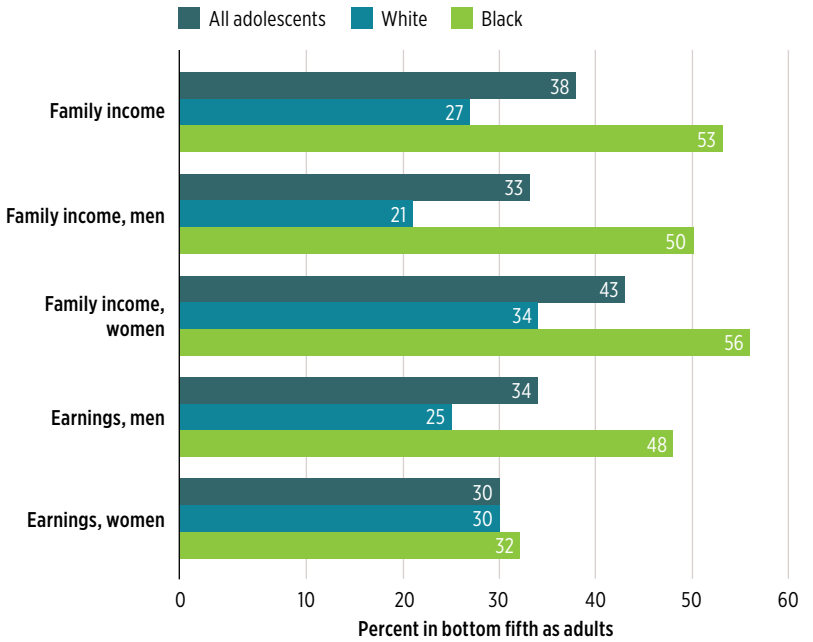
Remarkably, there is no difference in upward mobility from the bottom when comparing the earnings of white and black women. However, looking at adult family income reveals large black–white mobility differences among

Figure 4. Percent of sons growing up in middle half of parental income in different fourths of the earnings distribution, by birth year



Source: National Longitudinal Surveys estimates and Winship (forthcoming).

Figure 5. Upward immobility of adolescents with parental income in bottom fifth

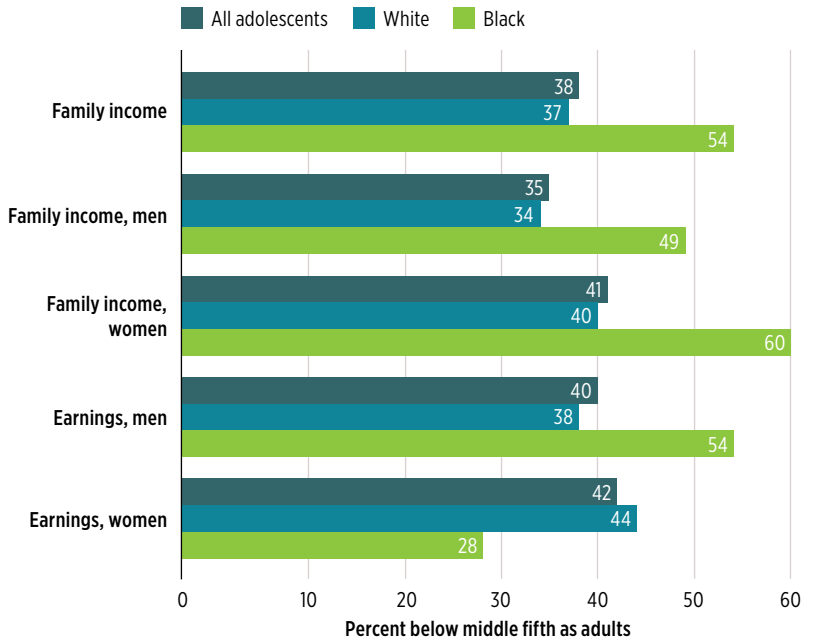


Source: National Longitudinal Survey of Youth (1979) and Winship (forthcoming).

women as well as men. Once again, white men have nearly perfect mobility rates. Among white women, 34 percent remain stuck in the bottom, but among black men and women, half or more do.

While there are not black–white differences for women looking at earnings mobility, there are large differences in terms of family income mobility. I suspect these numbers are capturing differences in marriage rates between whites and blacks. Essentially, black women are able to escape disadvantage in terms of their own earnings, but are not able to escape it in terms of family income because they are less likely to have the second income a husband provides. The marriage gap itself may reflect the difficulty that black men are having moving up. That is, black men may be less economically attractive to black women as marriage partners than they would be if they experienced the mobility of white men. Alternatively, it is possible that even if black marriage rates mirrored those of whites, low black male mobility might thwart the ability of many black women to escape the bottom fifth of family income.

Figure 6. Downward mobility of adolescents with parental income in the middle fifth



Source: National Longitudinal Survey of Youth (1979) and Winship (forthcoming).

Figure 6 examines downward mobility from the middle of the income distribution. It tells essentially the same story.

It is remarkable how few black women who start in the middle class fall below the middle fifth of female earnings. Here the "perfect line of mobility" would be at the 40 percent mark, but just 28 percent of black women starting in the middle fall out of the middle of female earnings. But turning to adult family income, 60 percent fall out of the middle.

Here, then, is the mobility problem in the United States—intolerably low upward mobility and high downward mobility for African American men, which is likely related to poor family income mobility outcomes for black women (despite their surprisingly strong earnings mobility). Fifty years after Selma, we still have far to go eliminating this fundamental racial inequality. Doing so will require that we better understand the problems that afflict black men (but not black women), the low marriage rates in the black community, and the interaction between these two sources of immobility. But if we insist

on believing that economic mobility in the United States is generally worse than in other countries and diminishing over time, we will misdiagnose the problem as uniquely American and pervasive throughout society. That may lead to policy responses involving government intervention that do more harm than good—for all Americans regardless of race. ■

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The Subjective Meaning of Mobility and Its Implications for Policy Solutions

KATHERINE S. NEWMAN
University of Massachusetts Amherst

The views expressed in this article are those of the author and do not represent an endorsement by the Federal Reserve Bank of St. Louis or the Federal Reserve System.

Over the past 30 years or so, my work has proceeded along several different but related arcs complementary to the research that economists and quantitative sociologists, such as Raj Chetty and Scott Winship, have contributed. Their work on economic mobility has given us a lot to consider with respect to the intergenerational life chances of low-income individuals and households.

I bring to these questions a strong interest in the *subjective meaning* of mobility. This includes the interpretations ordinary people have of their movement up and down the class ladder; of why this fate has befallen them; and their "moral understanding" of why their life chances diverge from those around them, who differ by generation, race, or social class. Second, as a qualitative researcher, I have tried to contribute to our understanding of how the behavior of families and households have facilitated or impeded the realization of these mobility dreams. I will offer some observations on what kinds of policies make a difference and what kind of differences matter most to the man and woman on the street.

At the outset, I note that in the communities of low-wage workers and near-poor families I have studied for decades, very few ever imagine that they could go from the bottom to the top; hence, the odds of such a rocketing rate of upward mobility is not on their radar. Rather their goal is more modest: to consolidate whatever gains they have achieved and hold on to that stability, to inch forward on their own steam, and above all, to see their children do better than they have.

The subjective understanding of mobility is important not only because it colors the sense of how actions or decisions will impact the individual or their families, but because when we can add up all of those perceptions across millions of people, it affects the public's openness or resistance to policy solutions that we might advocate for improving mobility. The public tends to assign a very different moral weight to the status or conditions of individuals if they think that the odds are against them than if they think those individuals have an equal shot at the brass ring. If your fate is dependent on your own efforts, rather than the opportunities and conditions that block even the most diligent, then we focus attention on values and are often indifferent to the outcomes of adults, even though we care a lot if their actions punish the next generation.

When the fate of millions is, instead, conditioned by structures over which they have no control, the public is more willing to invest in amelioration or, in

our better moments, the dismantling of systematic barriers to intergenerational mobility. Of course, a lot of it depends on whether people recognize those blockages to begin with. When I began my research for *Falling from Grace: The Experience of Downward Mobility in the American Middle Class* (1988), I was very surprised to learn how little social scientists could tell us about the understanding ordinary people had of economic cataclysm of the 1930s. Very few Americans toward the bottom of the economic ladder understood that there was something called the Great Depression descending on them. Wives knew their husbands were out of work; everyone knew that the factory nearby was shut down. But widespread understanding that something we now call the calamity of the Great Depression was surprisingly lacking. Few poor households had radios. Access to newspapers was stratified. And this fact colored understandings about who was to blame for any given person's persistent unemployment. Even something as enormous as the Great Depression did not necessarily generate an understanding in the general public about the nature or presence of structural barriers.

Mobility is one of the most mathematical topics in the social sciences, but it is also freighted with moral sentiment. And here I use the term "moral" as Émile Durkheim did, to indicate the ways in which a culture assigns a normative significance to patterns of ascent and descent (1964). This is particularly true in the United States. Our culture has always been preoccupied with mobility. As Max Weber argued long ago in his classic study, *The Protestant Ethic and the Spirit of Capitalism*, individuals read economic success or decline as indicators of their own or others' moral worth (1958). Our culture has a strong tendency to treat positive outcomes as a reward for hard work and superior skills, while treating setbacks as indicative of laziness, lack of striving, or inferior ability. With this, mobility not only reflects economic well-being, but it has profound effects on feelings of self-worth and claims to dignity.

The first book I wrote on this subject that gained a large popular audience, *Falling from Grace* (1988), was concerned with how people who lost well-paying jobs during the last major recession in the 1980s and landed new jobs that were vastly lower in prestige and income dealt with explaining this unhappy fate to their spouse, children, neighbors, and friends. They had not just lost jobs, they had lost their social identities and claims to honor. For most of them, dealing with job loss was an uphill slog against a culture whose default assumption is individual agency, a cultural script that often overlooks brute facts like double-digit unemployment, and the tendency of employers to treat displaced workers as spoilt goods.

As the adults in the middle class spiraled down, their children felt a sense of shame and bewilderment at the abrupt material losses. This was compounded by the knowledge that their parents seemed no longer in control of the family's

destiny. Middle-class parents and children are surrounded by a belief system that dictates that they are the masters of their own fate. This culture preserves a very valuable sense of agency and motivates them to avoid disaster. But when fate did not cooperate, there was no refuge from self-blame for the adults and a persistent sense of insecurity among the children.

American culture, however, is not so monolithic as to dictate that this is the only way to understand an economic free fall. Some groups of displaced employees that experienced these losses were left with a stronger sense of personal integrity but a weaker sense of agency. These were the members of occupational groups that plummeted down the class ladder as a mass because they were fired, and who interpreted their losses as consequences of heroic sacrifice or victimization that was not individual but collective. They did not see themselves to blame, but they were also inclined to hope as a group that someone else would rescue them. They believed that the public would somehow come to recognize this sacrificial mode and somehow restore their livelihoods and virtue.

Those studies of downward mobility and the middle class commenced in the Reagan-Era recession that gave us a double-digit unemployment rate. That downturn reached into the heart of the middle class. These were people who expected stability, who expected to work in the same firms for decades and instead discovered a new, rude reality. While those expectations are very much a thing of the past, I imagine the experience of downward mobility in the Great Recession, while no less disturbing, is experienced more as a frustration than a shock.

These middle-class preoccupations tend not to be so salient among the working poor, for whom the task of managing scarcity is paramount and volatility is a way of life. As psychologists have noted, people are much more concerned about avoiding losses than obtaining gains. We really hate to lose what we already have, and even contemplating the possibility of loss creates tremendous anxiety. One implication of this, perhaps, is that intergenerational upward mobility is less important than the phenomenon of intergenerational downward mobility for social stability. Downward mobility and economic precariousness loom very large in the popular consciousness. A second implication may be that while social mobility matters for many people, it is less a question of long-distance mobility, such as moving up from the bottom to the very top, but rather moving up small distances during the good years and avoiding sliding backwards.

In "twin" books, *No Shame in My Game: The Working Poor in the Inner City* (1999) and *Chutes and Ladders: Navigating the Low-Wage Labor Market* (2006), I chronicled the fate of minimum-wage workers who were in poor households when they entered my sample in the mid-1990s over the

succeeding eight years. I saw about a third of them move out of poverty to something approximating the blue-collar middle class or the lower rungs of the white-collar world.

Four routes were taken by the most fortunate of the groups in *Chutes and Ladders.* In the first pathway, economic growth created expansion, even among minimum wage employers, which opened up internal promotion ladders in the firms where my subjects were already working. They seized every chance to move up. Line workers were able to become first-run management in new shops opened by expanding franchise owners.

The second route involved moving from low-wage service jobs to much higher-wage union jobs, whether they were more skilled or not. Public-sector jobs were most valued. Union employment offered good wages and, more importantly, a suite of benefits unknown to fast food workers or retail employees. Looking for unionized employment was something of a holy grail for these Harlem workers; jobs in the post office or the Metropolitan Transit Authority had been critical to the middle-class status of the older members of their families, and where they could secure jobs of this kind, they took every opportunity to do so.

The third route entailed firm-hopping, especially after accruing more education. I was stunned to discover what a high proportion of the low-wage workers I studied continued to go back to school after the age of 25. It often took them 10 and maybe even 15 years to complete college, yet they continued to struggle toward that end. And it was a struggle, particularly on the financial side. Low-wage workers had to amass their own financial aid. Measurements of college completion over a six-year period don't begin to capture that continued effort.

Finally, the fourth route to mobility involved changes in the composition of the household. Cohabitation that results in income pooling doesn't always make a positive difference, but it can—as can formal marriage. When children in these households got old enough to go to work, the earner-to-dependents ratio in the family improved. In these instances, the target subjects in my study didn't actually experience any personal mobility at all. But because they were members of households that changed along these lines, they experienced a higher standard of living. At least until the adult children broke away to form their own households, these families could pool their income and move up out of poverty.

The experience of these most fortunate households was noteworthy because researchers did not expect workers who started off in a minimum-wage job as adults in Harlem to see that much improvement in their lives.

Not everyone in *Chutes and Ladders* was a success story. One-third of the people I followed in Harlem from the mid-1990s to 2004 moved from entry-level jobs in the fast food industry to retail jobs that were less stigmatized and slightly better paid, but not enough to take them very far above the poverty

line. They ascended into a category I became very interested in. I called it the *near poor,* which was 100 percent to 200 percent above the poverty line. The near poor welcomed a higher standard of living, but their hold on it was precarious. An illness in the family, disruption in childcare, an unreasonable landlord, domestic abuse—any of these problems—could and did push the near poor back below the poverty line.

Finally, the remaining one-third of the people I followed slid into deep trouble. Although they started out in minimum-wage jobs, over the succeeding eight years, they bumped along the bottom of the class structure. Moving in and out of severe poverty, they faced long bouts of unemployment, engaged in informal employment, and lived in marginal housing. Eviction, frequent moving, and doubling up was common amongst them as was domestic abuse, substance abuse, and depression.

The difference between the most successful people I followed out of this fast food industry and that middle group, the near poor, came down to policies that helped stabilize and hence consolidate gains as adults. What were those policies? As Victor Tan Chen and I detailed in *The Missing Class* (2007), they included childcare, sick pay, job protection in the face of family emergencies, and flexibility in work hours. These were the policies that mattered the most in keeping people in the labor market and keeping them from falling down the class ladder when family emergencies did strike.

I want to conclude by commenting on the regional differences in mobility reported by Raj Chetty. He notes that the likelihood of upward movement from the bottom to the top is greater in some places than others and notes that segregation, educational equality, civic engagement, and other factors explain the divergences. Rourke O'Brien and I published a book in 2011, *Taxing the Poor: Doing Damage to the Truly Disadvantaged,* that observed similar regional differences in morbidity, early mortality, teen pregnancy, and high school dropouts. These regional patterns held for blacks and whites.

O'Brien and I found a very strong correlation between these negative outcomes and regressive taxation. Where states develop a heavy reliance on sales tax, including food tax, and a low reliance on progressive tax, especially income and property tax, we see high levels of poverty and Chetty sees relatively low levels of upward mobility. The problem of taxing inequality, for the poor, emerges at the local and state level because the federal tax structure is uniform. In many parts of the South, state and local taxations compound one another such that tax even on food can reach as high as 12 percent in many Southern communities.

History has imposed a persistent divergence within the United States by region. In the aftermath of the Civil War, radical reconstruction in the South ushered in a 12-year period of progressive taxation that funded publicly

supported educational and medical institutions to serve the freed slaves. Those progressive policies were all repealed in the period when Reconstruction ended, a period that is referred to by those who detested radical reconstruction as the Redemption Period. A series of laws were enacted in many Southern states—from super-majority rules to referendum requirements and, in some instances, state constitutional amendments that limited spending—to reverse the tax provisions that had been so repugnant to whites, especially white land owners, in the South. Enshrined in state constitutions, those Redemption Period laws are still there. They put a very sharp block on raising revenue for education, or anything else, through any instrument except regressive taxation. That is what Bill Clinton and other progressive Southern governors discovered when they tried to raise taxes in order to improve educational outcomes nearly 100 years later.

Accordingly in the South and increasingly in the West after Proposition 13, sales taxes rose sharply over the last 30 years. This had the consequence of robbing the poor of the income they needed to improve their lives.

Public policy matters in setting the stage for mobility, as this audience knows all too well. Policies that impact unemployment and underemployment, that facilitate or retard the ability of earners to stay in the labor market, that see the working poor keep their earnings (the Earned Income Tax Credit) or lose those precious resources (to regressive taxation, reliance on fees, etc.) make a difference. If, at the end of the day, we are able to foster the chances that someone born into the bottom quintile can move up to the top, we should celebrate. Until then, I would be willing to declare this a land of opportunity if we can just facilitate more modest movement up the ladder and the stability needed to stay there. ■

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Coming of Age in the Great Recession

LAEL BRAINARD
Board of Governors of the Federal Reserve System

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The many economic decisions an individual makes early in his or her working life—their first job, how much and what kind of an educational investment to make, how to finance that investment, whether to strike out on their own, and whether to rent or buy a home—can have a lasting effect on their subsequent financial security and the economic foundation they provide for their children. There are times, however, when larger forces materially interrupt or impede the individual efforts of young people to build a better economic life. The Great Depression left an indelible imprint on the generation that came of age in that era, influencing their subsequent job trajectories and attitudes toward risk and investment. The question we face today is whether the Great Recession may similarly leave a lasting mark on the many Americans who came of age in its shadow.

It is important to understand the headwinds encountered by the Great Recession generation as they navigated a daunting job market, and the lessons they have taken from the crisis, particularly with respect to investments in education and housing. And it is important to identify what actions can be taken to improve economic outcomes for the Great Recession generation, as their experiences will powerfully influence not just growth today but also the contours of opportunity faced by their children.

Employment and Participation in the Labor Force

Let's start by considering what it was like to graduate from high school or college in June 2009. The overall unemployment rate stood at 9.5 percent, and employers slashed 500,000 jobs that month—the 18th month in a row of job cuts. For young people, job prospects were even bleaker. Nearly one-fourth of teenagers in the labor force were unemployed, and the unemployment rate for people between the ages of 20 and 24 stood at 15.2 percent. Young African Americans and Hispanics experienced higher rates of unemployment than their white peers.

Even these painfully high unemployment rates—the highest since the early 1980s—understate the damage caused by the Great Recession to young people's work lives. The lack of job opportunities appears to have caused many young people to become so discouraged that they dropped out of the labor

force altogether, exacerbating a downtrend and driving labor force participation among young people to historical lows.

Even for those who remained in the labor force and have been fortunate to find work, compensation prospects have been poor. For example, inflation-adjusted full-time weekly earnings among 19- to 24-year-olds with only a high school diploma fell about 5 percent between 2008 and 2012.[1]

Of those who have found work, not only are many young people receiving low wages, but also many are working at jobs for which they are overqualified. A recent study by the Federal Reserve Bank of Boston found that employers responded to the slack labor market by increasing the educational requirements or the number of years of experience required for new hires, which likely froze out many from the labor pool and resulted in the underemployment of others (Modestino, Shoag, and Balance 2015). In 2012, roughly 45 percent of college graduates between the ages of 22 and 27 were underemployed, up by one-third relative to 2001 and the highest underemployment rate since the early 1990s; moreover, a recent study by economists at the Federal Reserve Bank of New York found that the Great Recession is prolonging the time it takes for a college graduate to settle into a career (Abel, Deitz, and Su 2014).

Recently, the labor market prospects for young people have started to improve, with the unemployment rate for 20- to 24-year-olds falling about one-third relative to its peak and inflation-adjusted earnings starting to rise. Nevertheless, even with this recent improvement, there is a risk that the high rates of unemployment, low labor force attachment, and stagnant wages experienced by those who have come of age in the years surrounding the Great Recession may have long-lasting consequences. A number of studies have found that graduating from college during a recession can have a lasting effect. If past studies hold true today, the employment rate of those graduating from college during the Great Recession may recover relatively soon, but their earnings may be reduced for up to a decade or longer as this cohort initially secures lower-quality jobs and then only gradually works its way back up to the normal earnings trajectory (Kahn 2010; Oreopoulos, von Wachter, and Heisz 2012). To the extent that these lost earnings translate into reductions in lifetime resources, they could affect life-cycle spending and investment decisions.

1 The data, which consist of median usual weekly earnings for employed full-time wage and salary workers who are 16 to 24 years old, are from the Current Population Survey (a joint effort between the Census Bureau and the Bureau of Labor Statistics) and are adjusted by the Federal Reserve Board's staff to constant 2009 dollars using the personal consumption expenditures index.

Education and Student Debt

Enrollment in colleges and graduate schools increased sharply during the Great Recession. With skyrocketing youth unemployment and compensation under pressure, the recession sharply reduced the opportunity costs of additional years of schooling.[2] For many, these additional educational investments are likely to be beneficial. Investing in additional education is a classic way of mitigating the negative effects of graduating in a recession, and empirical research suggests that the lifetime returns to completing a college degree are substantial on average (Abel and Deitz 2014).

As with any investment, however, the returns on educational investments are not uniform, and some investments do not pay off. The risk of a low return is accentuated when the investment is financed through debt and based on the assumption that the educational investment will translate into higher wages that make the debt payments affordable.

Indeed, student indebtedness rose sharply in the years surrounding the Great Recession.[3] The capacity of many families to pay for tuition was substantially reduced by the declines in income and wealth associated with the housing crisis and the deep recession. At the same time, public colleges and universities—long the most affordable option for students—saw some of the steepest rises in tuition as a result of state and local budget pressures due to the recession (and possibly reductions in quality in many cases) (Mitchell, Palacios, and Leachman 2014). Thirty-seven states have cut per-student funding for higher education more than 20 percent since the 2007–08 academic year, when the recession began. Since the outset of the recession, the annual published tuition at four-year public colleges increased 24 percent, after adjusting for inflation, during a period when real median incomes declined 8 percent.[4]

This confluence of higher enrollments, higher tuitions, reduced family resources, and uneven job prospects has caused outstanding student loan

2 Those graduating into a recession are slightly more likely to obtain an advanced degree. See Altonji, Kahn, and Speer (2014).

3 For more information on changes to household balance sheets during the Great Recession, see Bricker et al. (2014).

4 The change in public tuition is for tuition and fees, excluding room and board, and is from the National Center for Education Statistics website at **http://nces.ed.gov/programs/digest/d13/tables/dt13_330.10.asp?current=yes**. Published tuition rates do not reflect what students actually pay after financial aid and other assistance. The trend in real median income comes from DeNavas-Walt and Proctor (2014).

balances to more than double since the start of the Great Recession.[5] Moreover, this sharp rise in debt burdens is unevenly distributed across the population, with students from socioeconomically disadvantaged backgrounds disproportionately likely to use debt to finance education. In 2012, 79 percent of bachelor's degree recipients whose parents made under $30,000 incurred educational debt, compared with 55 percent of those whose parents had income over $106,000 (Baum, Elliott, and Ma 2014). Even adjusting for family income, it appears that, on average, minorities make greater use of student loan debt than their white counterparts.[6]

In most cases, the investments in education undertaken during the Great Recession will turn out to be positive over the longer term, even for individuals with loans to pay off. However, there are several factors that might substantially reduce the expected return of some of these educational investments. The first important determinant of whether an investment in education pays off is whether it leads to the successful completion of a degree. Recent data suggest that fewer than 60 percent of students who have started a bachelor's degree program graduate with their degree, and only 30 percent of those who have started an associate's degree or certificate program will finish their degree.[7] The Federal Reserve's 2013 Survey of Household Economics and Decisionmaking (SHED) indicated that students who had not completed a degree consider the cost of the education not to have been worth the investment by significantly larger margins than those who had (Board of Governors 2014, 22 table 11).

A second important determinant is the type of educational program, as there is wide variation in rates of return across different programs. For example, recent research has shown that for-profit colleges, on average, tend to provide a lower rate of return for educational investment than public or not-for-profit colleges and universities. Young adults who attended for-profit colleges are also more likely to default on their student loans, even after completing four or more years of education. Unfortunately, the students who are the first in their

5 The total amount of outstanding student debt, $1.2 trillion in 2014, is a reflection of both the high cost and the substantial rise in the number of students borrowing to go to school—some 41.5 million, compared with 22 million in 2004.

6 For example, among families earning between $60,000 and $99,999, 76 percent of African American bachelor's degree recipients graduate with student loan debt, compared with 66 percent of Hispanic graduates and 64 percent of white graduates. See Baum and Steele (2010).

7 Bachelor's degree graduation rates are within six-year graduation rates for the 2007 entering cohort. Associate's degree and certificate completion rates are for within 150 percent of normal completion time for the 2007 entering cohort. See table 326.10 and table 326.20 in the "Digest of Education Statistics" section of the National Center for Education Statistics website at **https://nces.ed.gov/programs/digest/2014menu_tables.asp**.

family to attend college are more likely than others to attend for-profit colleges (Cellini and Chaudhary 2012; Deming, Goldin, and Katz 2012; and Lang and Russell Weinstein 2012).

Despite the apparent lower likely average return to education at for-profit schools, attendance at these schools has increased faster since the financial crisis than at other institutions. Attendance at for-profit schools increased over 50 percent between 2007 and 2012—far outpacing the 10 percent growth in enrollments seen over this period at not-for-profit and public institutions. This rapid growth, and the fact that for-profit colleges disproportionately attract first-generation college students as well as students relying on debt to fund their education, bears careful scrutiny (Lang and Weinstein 2012).

Overall, the added educational investments made by the Great Recession generation could be a positive legacy of the crisis over the long term. But for some, the returns may not turn out to be worth the cost. For this group, the burden associated with student debt may constrain their economic opportunities for years to come. Borrowers who struggle to repay student loans face special challenges because student loans cannot be discharged in bankruptcy, unlike other forms of household credit.[8] Fortunately, largely because of significant policy changes, beginning in the 2008–09 school year, the vast majority of student loans have been originated directly by the federal government and have flexible repayment and deferment options.[9] Nonetheless, high levels of student indebtedness appear to be one factor influencing the Great Recession generation's slow progression into homeownership.

8 11 U.S. Code § 523(a)(8) prevents education debt from being discharged in bankruptcy unless the debtor proves that paying the debt would "impose an undue hardship on the debtor and the debtor's dependents." For the complete 11 U.S. Code § 523(a)(8), see the U.S. Government Publishing Office website at **www.gpo.gov/fdsys/granule/USCODE-2011-title11/USCODE-2011-title11-chap5-subchapII-sec523**.

9 The Great Recession also affected the way students borrowed to pay for college, as private lenders tightened underwriting standards. Private lenders originated more than $20 billion in student loans during the 2007–08 academic year. However, that figure fell to about $9.4 billion in the following year and reached just $5.6 billion in the 2010–11 academic year. During that same period, total federal loans originated increased from $49 billion to $76 billion. Federal student loan programs also changed significantly during this time. In 2010, Congress eliminated the Federal Family Education Loan Program, which provided a federal guarantee for student loans originated by private lenders, leading to a sharp increase in the number of students borrowing directly from the U.S. Department of Education through the Federal Direct Loan Program. In 2012, the Obama Administration created the Pay as You Earn program, which caps loan payments at 10 percent of discretionary income for eligible borrowers. The following year, Congress changed the method for determining Direct Loan interest rates—switching from a rate set by statute to a rate pegged to the 10-year Treasury note plus a markup.

Household Formation and Homeownership

Sharply lower household formation and homeownership rates are among the most striking legacies of the Great Recession, distinct from earlier recessions. The number of households formed each year dropped by more than half, from about 1.35 million in the early and middle 2000s to about 600,000 households per year after 2007. Moreover, the fraction of young adults who own homes also fell substantially: after peaking at 22 percent in 2005, the overall rate of homeownership among young people fell to 16 percent in 2014.[10]

The combination of high educational debt levels and poor job market prospects faced by young adults entering the workforce in the aftermath of the financial crisis are the most likely causes of these sharp declines (Emmons and Noeth 2014; Collins, Scholz, and Seshadri 2013). Indeed, the share of adults under age 30 living with parents or other family members rose significantly in the wake of the financial crisis and has remained at a high level.[11] The SHED found that, among individuals who live with their extended family or with roommates, over half are doing so to save money, and nearly three-fourths would move out on their own if they could afford to do so. Federal Reserve research also indicates that debt is an important determinant of whether a young person lives with their parents, even after controlling for labor and housing market conditions (Dettling and Hsu 2014). That analysis also indicates that credit delinquency and lower credit scores increase the propensity for adult children to move home as well as the length of time that young people live with their parents.

However, it is possible that, even after improving economic prospects help young people overcome these impediments and boost household formation rates, homeownership rates among the Great Recession generation could lag. Young people's attitudes toward homebuying may have changed as a result of witnessing their parents' experiences during the housing crisis. Instead of seeing homeownership as a reliably safe investment, many of today's young adults may now see some risk that houses could become financial albatrosses due to events beyond their control. If this is the case, the Great Recession cohort may be slower to buy a home than previous cohorts, even after meeting their pre-recession career and

10 For those young adults who have formed a household, the rate of homeownership increased by about 6 percentage points from 1995 to 2005, peaking at 37 percent in 2005, and has subsequently fallen sharply to below 30 percent today. The data consist of Board staff calculations using the Census Bureau's household vacancy survey.

11 In 1980, 36 percent of adults who were age 30 and younger lived with older family members. That fraction gradually trended up through the early 2000s, then increased sharply to more than 45 percent by 2012 and has not appreciably declined since then. The data consist of Board staff calculations using the Annual Social and Economic Supplement of the Current Population Survey.

earnings expectations. Indeed, research suggests that dramatic economic events, such as the Great Depression, can have a significant effect on individuals' risk-taking over their lifetime (Malmendier and Nagel 2009).

Moreover, there is some evidence that today's young people have a skeptical view of the wisdom of buying a home as a result of the housing crisis. The percentage of renters in the 18-to-34 age group who thought housing was a safe investment dropped significantly from 2003 to the first quarter of this year, from 85 percent to 59 percent, respectively.[12] Of course, it is premature to conclude that the financial crisis has permanently altered young people's attitudes toward housing investments, and several surveys indicate that young people continue to express a desire to become homeowners someday.

Nonetheless, if the decline in homeownership among young people proves persistent, the implications for asset building for the future could be of concern, since homeownership remains an important avenue for accumulating wealth, particularly for those with limited means. Even after taking into account the risks associated with homeownership that were brought into sharp focus by the financial crisis, there is still a strong case that homeownership positively contributes to household balance sheets (Herbert, McCue, and Sanchez-Moyano 2013). The benefit is largely due to the forced savings associated with homeownership-—not just for the down payment, but also for the regular monthly paydown of principal. While renters could, in theory, save and invest money on a monthly basis to achieve a similar result, the evidence suggests most do not.

Moreover, study after study has shown that homeownership positively contributes to the wealth accumulation of lower-income and minority households, albeit in smaller amounts than for higher-income and white households (Herbert and Belsky 2006). This finding is particularly important because housing also accounts for the majority of the assets held by these households. Lower-income and minority renters, on the other hand, have been found to accrue little or no wealth over time (Herbert and Belsky 2006).

The Great Recession Generation and Economic Mobility

Today's young people are the fulcrum of the economic mobility agenda. Those who have come of age in the shadow of the Great Recession have

12 The data are from results of the Fannie Mae National Housing Survey, which were provided directly to the Federal Reserve. The relevant survey question asked respondents, "Do you think homeownership is a safe investment (with a lot of potential or very little potential) or a risky investment (with very little potential or a lot of potential)?"

experienced substantial risks and faced daunting challenges in establishing themselves independently in their work lives and their home lives. By studying these effects and the actions that can support the resilience of the Great Recession generation, we will strengthen not only today's recovery, but also the opportunities facing tomorrow's children.

So it is particularly heartening that, despite the challenges of coming of age in the Great Recession, today's young adults—including minorities—remain optimistic about their future (Taylor et al. 2012). The challenge for practitioners and the research community is to deliver on this youthful optimism through policies and opportunities that promote strong and equitable economic growth.

The Federal Open Market Committee plays an important role by pursuing policies aimed at achieving maximum employment in the context of price stability. During the recovery from the Great Recession, monetary policy remained accommodative over an extended period, which supported labor market recovery—with significant improvement in overall unemployment, increases in job openings, and recent declines in underemployment—while inflation remained below its target. In addition, the Federal Reserve System, through its research and analysis of economic data, provides important insights on the dynamics of the labor market, investments in education, and the housing sector.

As the economic recovery continues to strengthen, it is important that we monitor the progress of young workers and their experience in the job market, their educational outcomes, their management of student debt, and their progress toward forming independent households and owning homes. Understanding the interaction of various economic pressures on young workers is the first step. The ultimate goal is to develop evidence-based policies and opportunities to support the generation that has come of age in the shadow of the Great Recession as they gain a foothold on the ladder to a better economic future. ■

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Fed Policy, Inequality, and Equality of Opportunity

JOSEPH E. STIGLITZ
Roosevelt Institute and Columbia University

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Many are concerned that America has not been doing well in either equality of outcomes or opportunity. Our nation has obtained the dubious distinction of being the country among advanced countries with the highest level of inequality of outcomes and one of the lowest levels of equality of opportunity.

This paper discusses the issue of inequality and inequality of opportunity, how Federal Reserve policies affect inequality, and what implications inequality should have for the conduct of Fed policy. I shall address both its role in macroeconomic management and in the regulation of financial markets. After a brief review of the state of inequality in the United States today, I will discuss the various channels through which the Federal Reserve affects inequality.

The State of Inequality in America

As I wrote in my book *The Price of Inequality* (2012), the American dream is, today, to a large extent simply a myth. The life prospects of a young American are more dependent on the income and education of his parents than in almost any of the other advanced countries.

When concerns about America's growing inequality surfaced a few years ago, some seemed to suggest that we should not be too concerned. What really mattered, it was argued, what really had made America a great country, was its equality of opportunity. But then, upon closer examination, it turned out that we were failing there, too.

For scholars of the distribution of income and wealth, this did not come as a surprise, for inequality of income and inequality of opportunity are closely linked. We can see this if we look across countries, or even if we look across counties in the United States.

As Americans, we should be concerned about inequality of opportunity because it runs so counter to broadly shared values.

Inequality and Economic Performance

But as economists, we should be concerned because inequality and inequality of opportunity is associated with poorer economic performance

and higher levels of instability. This was, in fact, one of the central themes of my book—highlighted by the title—*The Price of Inequality*.

The adverse effect of inequality on economic performance is the reason, too, that the International Monetary Fund (IMF) has put the issue of inequality at the center of its economic agenda. The IMF is concerned with helping countries achieve better economic performance, including greater economic stability. It now recognizes that greater equality and equality of opportunity is linked with improved performance and greater stability. The channels through which these effects are realized are an important research topic.

The notion that equality and economic performance can be complementary represents a recent and major evolution in economic thought. Arthur Okun, chairman of the Council of Economic Advisors under President Johnson, wrote a famous book called *The Big Trade-Off* (1975), the theme of which was that we could only have more equality if we were willing to give up on economic growth. The new perspective argues to the contrary—that equality and economic performance can be complementary.

The Meaning and Measurement of Economic Performance: Going beyond GDP

As an aside, I have deliberately been vague about what we should mean by economic performance. The International Commission on the Measurement of Economic Performance and Social Progress, which I chaired, unanimously concluded that GDP was not a good measure of performance (see the commission report by Stiglitz, Sen, and Fitoussi 2010).

There are many ways in which GDP is deficient. It fails, for instance, to reflect changes in security, an important dimension of well-being. The Federal Reserve is often judged on the basis of how well it has done in terms of the growth and stability of GDP. But the societal cost of the failure to maintain stability—of avoiding crises like that of 2008—is not well captured in standard GDP metrics.

The impact of the Fed's failure to ensure economic stability on insecurity should be obvious; but this crisis was particularly costly because so many also faced the risk of losing their most important asset. I will argue in this paper that the Fed has both "negative" and "positive" responsibilities: not only the responsibility of preventing harm, for instance as a result of instability, but a positive responsibility in ensuring that financial markets work like they should. It failed in ensuring that America had a mortgage market that would enable individuals to retain ownership of their homes in the face of a severe economic downturn, and the costs of this failure are obvious.

There is another cost, which research at the Fed has highlighted: a prolonged downturn, such as that which followed the 2008 crisis, has long-term effects on potential future growth. The value of the reduction in the expected present discounted of future GDP is enormous. In our metrics of the cost of the crisis, we should include this. These costs dwarf *any* estimate of the costs of any conceivable increase in inflation. It should be clear that monetary policy should have been more focused on avoiding these huge costs (see Stiglitz 2015).

One of the very important ways in which the standard measure is deficient is that GDP per capita describes only the *average GDP* per capita. It says nothing about what is happening to the typical individual (e.g., median income). GDP per capita could be increasing, yet most individuals could be experiencing a decline in their living standards. Certainly, if an economic system fails to deliver meaningful well-being for significant fractions of its population, it is questionable whether that system should be viewed as a successful economic system.

At its most basic, I claim that central bank policy has significant distributional effects, and in this paper, I will describe the various channels through which the policies of the Fed (or other central banks) affect equality and opportunity.

I should emphasize that these are under-researched topics. Upon close investigation, I am sure some of these will turn out to be more important than others. I am also sure, though, that the overall conclusion—that central bank policy has significant distributional effects—will stand. These distributional effects are not only important in their own right—with significant social consequences—but they can even affect the impacts of monetary policy on GDP as conventionally measured.

The Distributional Consequences of the Failure to Maintain Full Employment

There are two broad categories of channels through which monetary policy affects distribution. The first, the most obvious, and the most closely linked with one of the central missions of the Fed is its role in maintaining full employment and economic stability. These are effects that are mediated mainly through the role of the Fed in controlling interest rates and credit availability. The Fed also plays a critical role in regulating our financial system, and how it performs this function also has important effects on distribution. These effects are discussed in subsequent sections of this paper.

High unemployment hurts ordinary workers in three ways. It does so directly, not just for those who lose their jobs but also through the stress imposed on other workers as they worry about keeping their jobs. It also hurts ordinary workers through the downward pressure on wages that inevitably

results, and through the cutbacks in public expenditures, especially at the local and state level, that follow from weak economic performance. Each of these effects—increased unemployment, falling wages, cutbacks in public services—are felt especially hard at the bottom of the income distribution.[1]

Managing the Inflation/Unemployment Trade-Off

Today, there is a wide acceptance of a trade-off between inflation and unemployment, at least in the short run, and perhaps in the long run. But how that trade-off is managed can have important implications for inequality. There are two critical issues.

Uncertainty

One concerns uncertainty: we don't know for sure, for instance, the value of the Non-Accelerating Income Rate of Unemployment (NAIRU), the level of unemployment below which inflation starts to increase. There are risks of targeting too low a level of unemployment—an increase in inflation, and risks associated with targeting too high a level—an unnecessarily high level of unemployment. But those different risks are borne differently by different parts of our society. (The overall risk is more complicated, as I pointed out in my Marshall lectures a number of years ago: the overall societal costs depend on the costs of correcting a mistake made at a later date, and the relationship between expected costs and benefits of a marginally more aggressive policy depends on the concavity or convexity of the augmented-Phillips curve.)

What I want to emphasize here is that an excessive focus on inflation stability rather than output stability itself could lead not only to a larger average output gap but also to an increase in inequality. On both accounts, societal welfare is lowered.

Asymmetries in the Effects of Monetary Policy

The way that monetary policy has been conducted has asymmetric effects: what workers lose in the downturn they do not seem to make up in the recovery. This is related in part to asymmetric effects of monetary policy—which is more effective in reducing output than in expanding production—but it is also related to the aggressiveness with which the objective of avoiding inflation is pursued.

Typically, when the economy goes into a recession, real wages fall. As the economy recovers, wages start to rise. To recover lost ground, and to keep

1 There is an expanding literature on these subjects. For an earlier analysis showing that the brunt of unemployment is felt at the bottom, see Furman and Stiglitz (1998).

up with productivity, wages should rise significantly. But if, as this happens, the central bank, worried about the incipient inflation that this may bring about, tightens monetary policy, workers will never be able to make up in the recovery what they lost in the downturn. There is a downward ratchet effect. There is some evidence that such a process has been in play.

For individuals too, there is an asymmetry—the loss of a job implies a loss of human capital, and therefore expected wages going forward will be lower: hysteresis is real.

Contributing to a Jobless Recovery: Impacts in the Short Run vs. the Long

There is one more effect of monetary policy, as conventionally defined—an unintended effect, but one which cannot be ignored. Lower interest rates have two effects. They are intended to induce more investment. But they change the relative cost of capital and labor. Even though real wages have not done well in recent years, the decrease in the cost of capital (at least for those firms having easy access to funds) has been much greater.

Standard micro-theory would suggest that this would lead firms to invest in more capital-intensive technologies. It may pay (and has paid) them to invest in machines that replace even low-skilled workers—e.g., the automated check-out machines at grocery and drug stores throughout the country. This can have long-lasting (hysteresis) effects, evident most clearly in vintage capital models. It implies, in particular, that if we were able to restore output at time T to a given level Q^*_T, the level of employment at that output will be lower than it otherwise would have been, had we not had this period of super-low interest rates. To put it another way, it means that the level of output that we have to attain at time T to achieve the same level of employment will have to be that much higher. In effect, the low interest rates help create a jobless recovery. And, the jobless recovery has all the adverse effects on inequality that I discussed earlier.

Of course, when there is a deficiency in aggregate demand, as there has been since 2008, it is natural that the Federal Reserve lowers interest rates. This recession has been, as we all know, extreme. If the Fed focused more on increasing credit availability (rather than just lowering interest rates), these adverse effects might be mitigated.

In the current context, the observation of this adverse effect on income distribution is mostly a reminder of the limitations of monetary policy. It would have been far better—for this as well as other reasons—if we had stimulated the economy through fiscal policy. But that is a bigger question, for another paper.

Impacts on the Elderly

There is still another effect of monetary policy, as conventionally defined: lower interest rates have a particularly adverse effect on those retired individuals who have, out of prudential concerns, put much of their savings into short-term government bonds. The representative agent models often used by macroeconomists (or at least used before the 2008 crisis) by definition paid no attention to this and other distributive effects. Whether differences in marginal propensities to consume among different groups are sufficiently large that these distributive effects have *macroeconomic* significance may be debated; but that these policies have distinctly different effects on different groups cannot.

Older theories discussed how low interest rates helped borrowers at the expense of creditors. But that view is too simplistic for understanding the distributive effects of monetary policy in a modern economy. Increasingly, workers are relying on defined contribution pension programs, which means that they are *very* dependent on the returns to their savings for their livelihood.

Similar effects arise, perhaps with even greater strength, with quantitative easing (QE). One of the main channels asserted for its effectiveness was through the wealth effect—the increase in stock prices, the benefit of which went overwhelmingly to the top 1 percent—one of the reasons perhaps for the relative weakness of the effect, and one of the reasons QE contributed to wealth inequality. Data on wealth ownership show clearly that the portfolios of the rich are weighed more toward equity. Lowering interest rates benefits owners of equity—that is those at the top. There is, in effect, a transfer from holders of T-bills to holders of equity, and that transfer is a transfer which increases inequality of income and wealth.

Inequality and Explanations of the Limited Impact of Monetary Policy

From the beginning of the crisis, the Federal Reserve was forthright about its limited ability to restore the economy to full employment. Much of the policy was directed just at saving the financial sector; that was necessary if the economy was to be restored quickly to health, but it was not sufficient.

For the real economy to return to health required the resuscitation of aggregate demand. But if there are differences in marginal propensities to consume (and I believe the evidence is overwhelming that there are), then inequality affects the monetary policy transmission mechanism, and Fed policy has to be sensitive to this. The previous paragraphs explained how lower interest rates could increase inequality, by hurting elderly dependent on returns on T-bills

even as they benefited those at the top who own shares. But if the interest elasticity of investment and of consumers who are not constrained is low, then the net effect of lowering interest rates can be negative. This is even more so if many middle-class individuals are target savers—for instance, saving for retirement or to finance the college education of their children; then, lower interest rates imply a higher savings rate.

There are actions that the Fed could have taken, even within its limitations, to increase the effectiveness of monetary policy—actions that simultaneously would have reduced the adverse effects of monetary policy on inequality.

The Importance of Fixing the Credit Channel

One of the criticisms of QE was that much of the increase in liquidity went abroad and into increases in asset prices, and disappointingly little went into an expansion of credit. One of the reasons is that the credit channel was blocked. When the crisis struck, much of the focus of attention was on the big banks, who had engaged in such speculation. They were saved, but hundreds of smaller and regional banks—institutions that were more involved in lending to real businesses and to small and medium-sized enterprises (SMEs)—were let go. (There was a rationale for this behavior: it was natural that the Fed and the Administration focus on systemically significant institutions; but from a macroeconomic perspective, cutbacks in lending to the large number of smaller financial institutions have systemic effects as well. The consequences of this unbalanced program were given short shrift.)

This is one (though only one) of the reasons that lending to SMEs remained so far below its pre-crisis level years after the crisis. And the lack of flow of lending to SMEs is one of the reasons that our recovery remained so anemic for so long.

In short, the Fed (like the Administration) seemed to practice (and perhaps believe in) trickle-down economics. To me, it is not a surprise that it didn't work, and that the recovery was so weak.

The Importance of Making Markets More Competitive

Another channel through which it was hoped that QE would stimulate the economy was lowering the cost of mortgages, and increasing the prices of homes. While it almost surely had some effects along these lines, again the effects were sometimes disappointing, and again because we failed to address underlying problems in the financial system. The mortgage market is now less competitive than it was before the crisis, and the lower interest rates were typically not fully passed through to borrowers. Sometimes, it seemed a major

effect of the Fed's actions in lowering interest rates was to enrich the coffers of the banks.

The failure to ensure adequate competition of financial markets leads to higher inequality in several ways: there are transfers from ordinary citizens to well-off banks (as a result of higher interest rate spreads and higher fees charged for services, including those associated with the running of the payments system through debit and credit cards). And if the effects of monetary policy are less effectively transmitted to consumers, the economy is less likely to remain close to full employment.

Preventing the Financial Sector from Harming the Rest of the Economy

Traditional discussions of the Federal Reserve have focused on the role of the Fed in regulating the macroeconomy through its control of interest rates. But in the aftermath of the 2008 crisis, attention has shifted to its *regulatory* roles. It was its failure to adequately regulate the financial system more than its failure to set interest rates correctly that led to the crisis—as both the Fed itself and most academic critics have argued (see, for instance, Stiglitz 2010 and the references cited there).

In recent years, the focus of regulatory reforms has been on preventing the financial sector from imposing harms on the rest of the economy. This is important, and it is especially important to mention this in any discussion of the role of the Fed in inequality. The worst harm that the financial sector has imposed is bringing on crises—many of our major downturns, including that of 2008, arise from financial crises, typically generated by excessive credit and excessive risk taking.

Crises are particularly hard on the poor, and this crisis especially so, as millions of Americans lost their homes, their jobs, and their retirement accounts. The Fed, through its failure to fulfill its responsibility to maintain stability, bears some onus for the enormous increase in inequality that has occurred since 2008. The excessive focus on inflation—which, as I have suggested, contributed to the growing inequality *before* the crisis—had an even more adverse effect: it detracted from a focus on stability.

This was ironic, because the Fed itself was founded in response to the Panic of 1907—not because of a bout of inflation. The losses from the crisis—the deviation from where the economy would have been had the economy continued on its normal path and the output actually experienced—have already mounted to trillions of dollars, far larger than any cost that could have been attributed to mild inflation.

Preventing the Financial Sector from Exploiting Others

Preventing the financial sector from doing harm to our society entails, of course, doing more than ensuring that it does not act in a reckless way. We also have to ensure that it does not act in ways which exploit others—and especially exploit those who are poor. America's financial sector has excelled at this—moving money from the bottom of the pyramid to the top, and thus increasing inequality and reducing equality of opportunity.

We now all know about the predatory and discriminatory lending that was rampant in the run-up to the crisis. But such lending practices, though diminished, still continue, contributing to the impoverishment of large numbers of our citizens through payday loans, subprime auto loans, usurious credit card fees, predatory education loans, and rent-a-center and similar abusive attempts to circumvent the little regulations that we have on usury.

These are problems that have been long with us. When I was in the Clinton administration, we tried to curtail the predatory for-profit education sector, which prospered solely because of government loans and other forms of government support, including government guarantees for student loans from an equally predatory private financial sector. We failed because of the political power of the sector.

But it is not just the poor that the financial sector has exploited in ways that increase inequality. It has also exploited average Americans through noncompetitive practices that have led to high fees imposed on merchants for the use of credit and debit cards. These fees represent, in effect, a tax that is imposed on every transaction—ironically, a transactions tax that is far, far higher than the minimal financial transactions taxes that some countries have proposed and to which the financial sector has objected so strenuously. And it is a tax that does not go to public purposes, but simply to enrich the coffers of the financial institutions. Inevitably, the costs of these fees get shifted to ordinary consumers, and since the benefits of the high-reward, high-fee cards go to the rich, the effect of these noncompetitive practices has been to redistribute income from poor and middle-income Americans to the rich.

Other countries' central banks—most significantly Australia—have taken strong actions to curb these abusive practices, and they seem to have worked. Finally, recent court decisions in the United States provide some hope that they will be curbed here, too. But I cannot but remark that I think the implementation by the Fed of the Durbin Amendment, the congressional provision attempting to curb these abuses—limited as it was to debit cards—was woefully inadequate, as Judge Richard Leon concluded, even if the Appellate Court

decided that such a decision was within the discretion of the Fed.[2]

It would have been far better for our economy—and for inequality—if Congress had acted earlier; if when it acted, it had included credit cards as well as debit cards; and if the Fed, when it came to implementing these regulations, had acted more vigorously to ensure competitive pricing.

The Fed's Positive Agenda: Making Financial Markets Serve All Americans

The Federal Reserve, as I have said, has important regulatory responsibilities, besides its macroeconomic management responsibilities, and among those is to ensure that the financial system does not harm the rest of the economy. I have just detailed many of the ways in which the financial sector's actions have increased inequality.

But the responsibility of the Fed is broader. There is a positive agenda: *to ensure that the financial markets serve all Americans.*

Too much of the recent discussions about regulatory reform have focused on preventing the financial sector from imposing harm on the rest of the economy, especially by the excesses of risk taking which brought on the 2008 crisis; too little has been about how to ensure that the financial sector actually does what it should.

Earlier in this paper I have described two examples: making financial markets more competitive and fixing the credit channel. The broader positive agenda entails making the financial system actually act like how a competitive, transparent, financial system should, serving the interests of the country rather than just its own interests and recognizing that the financial system is not an end in itself, but a means to an end—to a more prosperous economy. In particular, this means ensuring that the credit channel works; that, for instance, funds are provided to small and medium-sized enterprises. Access to funds for new entrepreneurs, for ambitious young people striving to get ahead, is an important way in which opportunity is enhanced. Interestingly, when I was in China in the spring of 2015, discussing with the Premier the high level of inequality that afflicted that country, he put particular stress on this aspect of China's agenda.

If the banking system is to do this, its attention needs to be redirected, from the kind of activities that were more recently the focus of its attention—such as

2 As a matter of disclosure, I have served as an expert witness in the litigation against the credit card companies. The most recent court decisions have concurred with my judgment that the practices of the credit and debit card companies have been highly anticompetitive.

trading, speculation, market manipulation, etc. That's why regulations like the Volcker rule, the Lincoln Amendment (which was unfortunately repealed), and similar provisions are so important.

Ensuring Access to Credit

But the Fed and other regulatory agencies overseeing the financial sector have a larger responsibility. They need to affirmatively work to create a competitive and transparent financial sector focused on providing broader access to finance. This was, of course, one of the intentions of the Community Reinvestment Act (CRA), which I believe has, overall, worked.

CRA illustrates how a government mandate to lend to underserved communities can actually focus attention on a critical issue in an effective way. Once its attention was focused on lending to underserved communities, our financial sector figured out how to do it in ways that were profitable. It used its ingenuity to identify good potential borrowers, and to work with them to make sure that the businesses were a success.

Supporting Community and Regional Banks

But there is much, much more that needs to be done and can be done. I mentioned earlier that in the crisis we paid too little attention to our community and regional banks and other financial institutions. These local banks play an important role in the development of the communities of which they are a part. In the years since the repeal of Glass-Steagall, our banking system has evolved into one that is not only more reckless, but more concentrated, with less competition, less concern for providing finance to the small businesses of our country, and in which our community and regional banks play a less important role. But acknowledging the potential role of these banks is not an argument for allowing them to engage in the bad practices of the larger banks.

Helping Create a Housing Mortgage Market That Works—for All Americans

Consider the housing finance market. Our private system clearly failed, at great cost to millions of homeowners and our economy. I was among many who pointed out, at the very beginning of the securitization movement, the inherent flaws, related to problems of imperfect information (see Stiglitz 1992).

It is noteworthy that nine years after the breaking of the housing bubble, eight years after the beginning of the recession, we have not been able to restore the private mortgage market. Part of the reason, I believe, relates to the inherent flaws in the securitization model that I have discussed elsewhere. But we also have to admit that for all the so-called innovativeness of the financial

sector, it failed to innovate in ways that would enable ordinary American homeowners to manage the risk of homeownership.

The financial sector's innovation was more directed toward its ability to, as the title of George Akerlof and Rob Shiller's 2015 book puts it, "phish for phools"—to better identify those that it could exploit. There are alternative mortgage products that would be far more efficient in lowering transactions costs and managing risks, but evidently, our financial markets were not interested. In a forthcoming Roosevelt Institute paper, I set out a set of reforms that I believe would lead to a better performing mortgage market.

I emphasize this here because nothing has done more to increase inequality of wealth and decrease homeownership rates, which have markedly decreased (after peaking at some 69 percent in the mid-2000s, it is now at a 20-year low, under 64 percent). The impacts have been particularly severe upon Hispanics and African Americans.

Financing Higher Education

Building up our communities entails not just providing better access to credit for our businesses and families, but also enhancing opportunities for individuals to get ahead. We need a better way of financing higher education. We need to do better than just the modest proposal to provide better access to community colleges that the President has put forward.

We have to provide access to the best education for which each person is qualified. We can't have a system that says that if you are poor, you can go to an underfunded community college; but if your parents are rich, you can go to a higher-tier school. And we especially shouldn't have a system that allows private for-profit schools to engage in their predatory activities, taking advantage of poor Americans—with private lenders and the government complicit in providing loans that will be a noose around their necks. Australia has shown that there is an alternative: an income-contingent loan program can provide opportunity for all, enhancing societal mobility.

Inequality and Central Bank Independence

No matter what the Federal Reserve does, it has an effect on inequality, for good or for bad. Given the importance of inequality in our society, it needs to pay attention to these effects. It would need to pay attention to these effects even if it saw its only mission as macroeconomic performance and stability. We are long past the day when economists could appeal to the Second Welfare Theorem, to use economic jargon, which says that the role of the economists is to maximize GDP and that issues of distribution should be left to others. Today,

we understand why both the First and Second Welfare theorems (asserting that markets are always efficient and that every Pareto-efficient outcome is attainable through market mechanisms, with appropriate lump sum redistributions) are of limited relevance.

If monetary policy has these large distributive effects, a question naturally arises: how can we justify delegating fundamental social trade-offs to technocrats? Can we really justify the kind of independence that central banks seem to prize? And especially when central banks are engaged in quasi-fiscal transfers, giving money to some financial institutions and withholding it from others, and even more so when many "independent" central banks seem to have been captured by the financial sector, a kind of capture that might have been more difficult if there was more accountability or more representativeness in their boards.

Was it an accident that many of the so-called "independent" central banks performed far more poorly in the run-up to the Great Recession than those that were more politically accountable? Did their independence make them more easily captured by the financial sector, which saw increased profits in the agenda of deregulation and loose regulation? There are subtle questions in institutional design that I cannot adequately address here; few would want to turn over the conduct of monetary policy to some of the politicians that dot the political landscape. Suffice it to say that once one recognizes the distributive consequences of central bank policy, a more nuanced approach is required.

Overview: Monetary Policy and Inequality

The Federal Reserve was created in recognition of the fact that market economies are not self-regulating. It was created to deal with a problem of financial instability, but over time, its mandate expanded, to include full employment, growth, and inflation. In the years preceding the crisis of 2008, it lost its way: it seemed to focus single-mindedly on inflation, in the mistaken belief that doing so would ensure growth and stability. As we have observed, it even forgot its own history: it was not created in response to a bout of inflation, but in response to the Panic of 1907.

Today, fortunately, it seems to be regaining its footing. Many if not most members of the Fed recognize its responsibility for the broader management of the economy. Whether it likes it or not, what the Fed does has significant effects on inequality. Furthermore, the effectiveness of Fed policy, in turn, depends on many features of the economy over which it has some control, both through its macroeconomic and regulatory instruments: it depends, for instance, on both the level of inequality and on the competitiveness of the financial system.

We have thus come to understand that monetary authorities should recognize that they have more tools and instruments and broader objectives—both intermediary goals and ultimate objectives—than has been traditionally conceived. GDP is itself an intermediary goal—the ultimate objective is increasing the well-being of our society. Within this broader perspective, there should be a concern about inequality both because of how it affects overall economic performance and because it affects the well-being of ordinary citizens.

Central banks have responsibilities both in macroeconomic management and financial sector regulation. It is natural that their responsibility should embrace the latter, for as we have seen, a major source of economic instability is the financial sector.

The issues of inequality are intertwined with all the other issues that the Fed has to deal with. I have highlighted how this is true for the standard policies of macroeconomic management, as the Fed faces the difficult trade-offs that it regularly confronts. But it is especially true in the arena of regulation. For instance, if more had been done to prevent predatory lending, perhaps the economic shock would have been less; certainly, the adverse effect of the crisis on inequality would have been diminished.

It is not an accident that the innovations of the financial sector in the years before the crisis did not lead to stronger economic performance, though they led to higher instability and greater inequality. Much of the financial sector innovation that was not directed at regulatory arbitrage and circumvention was centered on creating better ways of exploiting poor and financially unsophisticated individuals. Such exploitation may succeed in moving money from the bottom of the pyramid to the top, but such innovation does not provide the basis of stronger, sustainable growth. More effective regulations preventing these activities would have led to more stable growth, and more equality.

But we need to move away from just focusing on how we can prevent the financial sector from doing harm, and to a more positive agenda. How can we create a financial sector that actually enhances opportunity? It would be a different financial sector from the one we have today, but I believe it is achievable, and I believe the Fed has an important role in attaining this goal.

The Roosevelt Institute, where I serve as chief economist, has been actively engaged in two research programs, one focusing on how to make our financial markets function better, the other on how to create more shared prosperity—how to reduce the country's high level of inequality and promote equality of opportunity. The two strands of our research programs are, in fact, closely related, because our flawed financial system is part of the reason for the growth in inequality. The Fed is at the center of our financial system, which is why what the Fed does is so important for what happens to inequality.

We need to realize that what has happened in the last third of a century is fundamentally different from what was occurring in the previous third of a century. Then we were in the process of creating a middle-class society based on opportunity for all. Since 1980, we have been creating a society where all the benefits of growth go to a very few at the top. Median income, adjusted for inflation, is lower than it was a quarter century ago. We have moved into a negative-sum world, where the gains at the top have not led to gains for all, but to slower overall growth and stagnation for the majority.

The problems we have created are not amenable to small tweaks or minimalist solutions. They are simply too large. There is a need for a fundamental rethinking of the structure of our economic and legal framework and the policies by which we manage our economy. A re-examination of our macroeconomic and financial policies will be an important part of this rethinking. The Fed can and should play an important role in this process. Our recent book *Rewriting the Rules* (Stiglitz et al. 2015), provides a framework for these reforms.

In short, we can have a better-performing economy, with higher growth and more equality, if monetary policy and financial regulation is conducted with an eye to the impact of policies on distribution. Rethinking monetary policy through this lens will not be easy. Reforming monetary policy will be even more difficult, for those who have done well under the current system have both the incentives and resources to use their influence to oppose these changes.

But it is the only way forward: The only way that we can achieve sustained prosperity is to have shared prosperity, and the only way that we can achieve that is through a monetary policy and a financial system that is not based on trickle-down economics but rather directed at increasing the well-being of all Americans. ■

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SECTION 2

Economic Mobility & Families

A Generational Perspective on Living Standards: Where We've Been and Prospects for the Future

NEIL HOWE
LifeCourse Associates

DIANA ELLIOTT
The Pew Charitable Trusts

Diana Elliott's contributions to this paper are her own and were not conducted by, or reviewed by, staff of The Pew Charitable Trusts.

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A century has passed since Walter Lippman (1914) coined the term "American Dream," which to most Americans has come to mean the assumption that every generation ought to enjoy some progress over the previous generation in material living standards. When James Truslow Adams (1931) popularized the term a few years later (poignantly, at the depths of the Great Depression), he defined the dream as the expectation, "generation after generation," that America would build something "bigger and better." He described the American pageant as a sequence of generational challenges—first to cross the Appalachians, then dig the canals, then build the railroads, then fight the Civil War, and so on. "It was largely in the period from 1830 to 1850, when the nation was growing like a weed, that this conception took deep root among us," he wrote, though he implies that it goes back at least to the nation's founding.

In the wake of the Great Depression, Americans sought to avoid any future threats to the "bigger and better" dream Adams described. The fast-growing economics profession in the 1940s created a detailed system of national accounts in part to measure the progress of living standards in dollars as well as to diagnose new recessionary threats to that progress. And during the first three decades of the postwar era, most of these product and income metrics did indeed rise strongly.

Since the mid-1970s, however, those metrics have decelerated overall, and many of them have changed direction. In 2014, for example, the real median incomes of families, of households, and of persons in the United States were actually below their values in 1998, 1997, and 1998, respectively. Media stories about "stagnant" or "declining" American living standards have proliferated. In surveys stretching back to the early 1980s, the shares of Americans saying that "my kids" or "the next generation" will do as well or better than "me" or "today's generation"—while fluctuating up or down with the state of the economy—have trended downward over time.[1] According to a NBC News/*Wall Street Journal* poll taken last year, 76 percent of Americans are "not confident" that "life for our children's generation will be better than it has been for us," which is by far the largest share since that question was first asked in 1992 (O'Connor 2014).[2]

1 See for example *USA Today*/Gallup poll question asked since 1983; see also question archives at **www.gallup.com/poll/159737/americans-divided-outlook-next-generation.aspx**.

2 See also question archives at **www.pollingreport.com/life.htm**.

Introducing the Generational Perspective

How to help younger generations do better economically has, not surprisingly, become a growing focus of policy discussion. "Younger," for this purpose, often means Millennials in their mid-20 trying to launch careers. But it may also mean older generations. It may mean Boomers in their mid-50s trying to prepare for retirement.

Yet as policymakers struggle to help these generations work and save, they are hindered by relatively little understanding of who these generations are, why they differ, and how these differences have shaped their work and savings behavior to date. The central premise of our paper is that a generational challenge requires a generational perspective—and that before devising new policies to help generations pursue the American Dream, policymakers need to consider the generational life stories of those who are actually engaged in that pursuit. By "generation," we mean—as did Adams—a social generation, a group of people who are born over roughly the length of the phase of life and whose behaviors and values are shaped at every age by roughly the same forces of history.

Generations are an inherently multidisciplinary field of study—since they are historically involved (both as effect and as cause) in a broad variety of social and cultural forces. Most economic policymakers, by contrast, tend to be monodisciplinary and prefer to simplify the world into strictly solvable parameters. While economists do sometimes refer to "generations," they typically define them as ahistorical concepts (in a "generational equity" or an "overlapping generations" model, for example). They seldom refer to generations of real people. Unless they are working collaboratively with other social scientists, most economists regard a cohort group (or an age bracket at any point in time) as just a group of individuals with randomly distributed endowments and preferences.

We think much is lost by this simplification. In general, members of the same cohort group are members of a generation that share a common age location in history and that possess, at any given time, a broadly similar set of past experiences and a broadly shared set of future expectations. As such, their endowments and preferences are *systematically biased* this way or that.

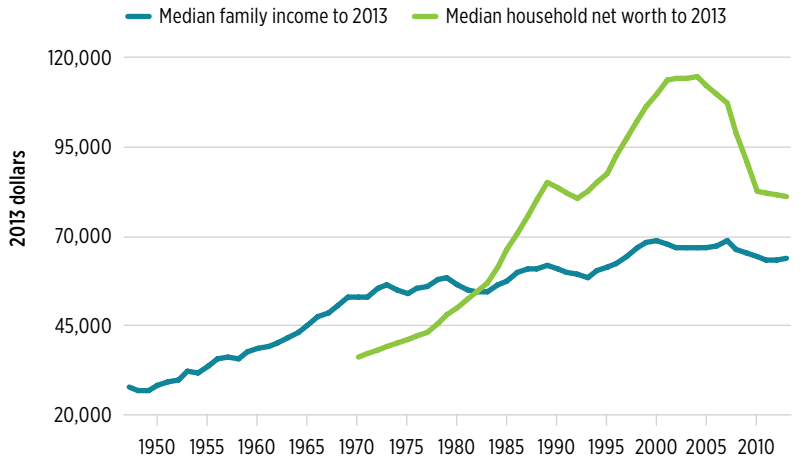
To grasp how this happens, consider how generational membership shapes people and differentiates them from those younger or older in ways totally beyond their control—such as their aggregate number or their ethnic composition or the way they were raised as kids or the age at which they encounter economic booms or busts. And then think about how it shapes them in ways they do in some sense collectively choose—such as their attitudes toward authority or family or risk or work or civic cooperation. Along the way, as

Adams suggests, each generation redefines "the American Dream" according to its own vision. The World War II-winning G.I. generation came of age with D-Day and defined the American Dream in terms of a strong middle class and a "Great Society." Many of their Boomer kids came of age with Woodstock and celebrated radically more individualistic and values-driven life goals. These differences are not mere cultural footnotes. They've driven dramatic changes over time in how much families save, how parents finance their homes or kids' education, and how voters sway regulatory, tax, and fiscal policy.

Looking at living standard growth or decline from a generational perspective means, first, taking a fresh perspective on the overall data, and second, creating a fresh set of explanatory (and generational) narratives. In the rest of this section, we will focus on the overall data. In the following sections, we will turn to the narratives.

We start by considering (in figure 1) two of the most often-cited measures of U.S. living standards: the census data on median family income and the Federal Reserve Board Survey of Consumer Finances (SCF) data on median family net worth, both expressed in constant dollars. Both series certainly offer plenty of reasons to be concerned about overall living standard trends in recent decades. Real median income shows an obvious trend turning point

Figure 1. Alternative measures of U.S. standard of living, 1947–2013, in constant 2013 dollars



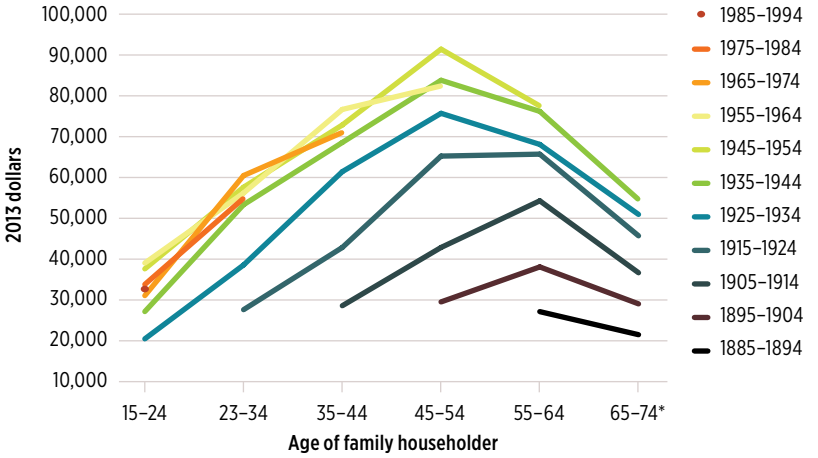
Note: All series deflated to 2013 dollars with CPI-U-RS.
Source: SCF, Fed Bulletin (2013 and earlier years); CPS, table F-11, Census (2015).

in 1973 from faster to slower growth—and, since 2000, may show another turning point from slower growth to zero growth or worse. The trend in real household net worth, while not showing the same turning points, looks even more alarming. It illustrates how the expansion of nonfinancial credit boosted household asset values over incomes for over 35 years—and how everything came crashing back down after 2007.

Many researchers have shed important explanatory light on these turning points by pointing to major "exogenous" shifts in labor productivity growth trends, in terms of trade, in employment rates, and in the distribution of national income. It obviously matters, for real median family income, whether output per worker is rising or falling, whether more or fewer persons per family are employed, and how output is divvied up by factor of production and by income bracket. The role of productivity growth is especially critical, and no history of median incomes over the last century could possibly neglect it. As Paul Krugman has aptly written, "Productivity isn't everything, but in the long run it is almost everything" (1994).

Yet neither the overall median income series itself, nor the aggregate economic drivers behind it, say anything in particular about the generational

Figure 2. Real median family income by age bracket, from 1885 to 1994 birth cohorts



Note: Families only, at exact date birth cohort coincides with age bracket; all series deflated to 2013 dollars with CPI-U-RS.
* Trended from values for all 65+ before 1987.
Source: CPS, table F-11, Census (2015).

experience—that is, about how each generation is differentially shaped by these macro changes or about how each in turn is differentially shaping them. Consider, for example, the flattening trend in overall real median income. Does it really point to any special difficulty faced by today's young? Maybe income is flatlining or falling for all age brackets. Consider further that this cash measure doesn't include the growing in-kind income most families receive, mostly in the form of health care.[3] So it's hard to know if there's any cause for worry.

It takes a generational perspective on these same data—which are now rearranged from 1950 to 2010 by 10-year cohort groups (in figure 2)—to understand what's really going on. Here we see that, yes, today's younger generations do indeed face unique challenges. Notice the upward jumps, and mostly big upward jumps, in the life cycle income of every cohort through early-wave Boomers (born 1945–54). But for every younger generation—that is, every cohort group that has not yet reached age 60—there is no such progress. In fact, the 1955–64 birth-year cohort group is the earliest-born ever in this census record to fall beneath an earlier cohort group in income at the same phase of life. Later-born cohorts at younger ages have meanwhile been falling beneath first-wave Boomers for decades—in what amounts to an awkward traffic jam.[4]

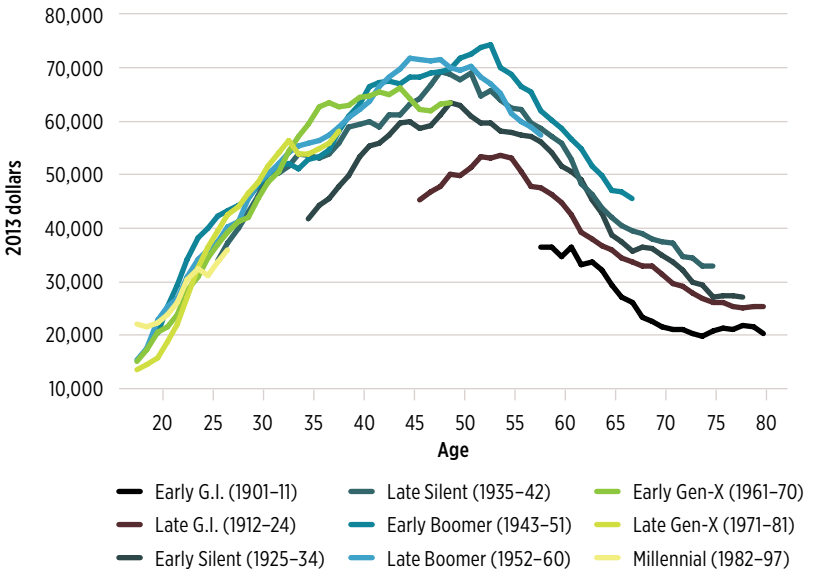
The impact of the business cycle, which can lift or sink families of all ages to some degree, is by no means missing from figure 2. Notice, for example, that most cohort groups born since 1945 were lifted somewhat "above trend" at whatever age they encountered the late 1990s, an era of both full employment and (temporarily) resurging productivity growth. For early-wave Boomers, it was age 45–54; for late-wave Boomers, age 35–44; for early-wave Xers, age 24–34. Yet these small ripples don't change the overall story line, which is the failure of younger generations to experience sustained income gains over the generations coming before them.

Another way to appreciate the inferior performance of later-born cohorts in figure 2 is to look at family income growth by age decade-over-decade

3 Government in-kind transfers plus employer contributions to private insurance (both mostly health-care related) amounted to roughly $1.5 trillion in 2009. See Katz (2012). To understand how government taxes and transfers affect the income distribution, see Perese (2014).

4 While rising rates of college attendance and completion in the youngest two cohort groups may suppress median earnings in the age 15–24 bracket, they don't have much effect thereafter. Historically, the college completion rate for a cohort at age 25–34 is very close to its lifetime completion rate. Over the last decade, moreover, the constant-dollar mean earnings of persons age 25–34 with bachelor's degrees has declined—and has declined faster than that of all persons age 25–34. See U.S. Census Bureau (2015b) for trend data.

Figure 3. Life-cycle income for half cohorts, in constant 2013 dollars



Note: All series deflated to 2013 dollars with CPI-U-RS.
Source: IPUMS-CPS (1964–2014).

since 1950. Rapid (over 10 percent) growth for families under age 35 lasted until 1970; for families age 35–44, it lasted until 1980; for families age 45+, it lasted until 2010. Any positive growth (better than 0 percent) for families under age 35 lasted until 1980; for all older families, it lasted until 2010. It makes no sense to attribute these young-old disparities to in-kind health benefits, since these are mostly flowing to older age groups; "cashing them out" would only accentuate the contrast.[5]

The advantage of the census series used in figure 2 is that it goes back to 1947. The disadvantage is that it only includes families and is sorted into 10-year age brackets. In order to refine our picture, we took a robust census income data sample for all households going back to 1964 and sorted them

5 While recent estimates of total in-kind income by age are unavailable, the dominant health-care component is skewed heavily toward older age brackets. In 2010, per-capita health-care spending (excluding out of pocket) is estimated to be $3,800 for age 19–44, $7,100 for age 45–64, and $16,000 for age 65+. See Centers for Medicare & Medicaid Services (2014).

into yearly medians for exact cohort groups of our choosing.[6] We started with the following social generation definitions:[7]

- G.I. generation born 1901–24
- Silent generation born 1925–42
- Boom generation born 1943–60
- X generation born 1961–81
- Millennial generation born 1982–95 (youngest adult in 2013)

We then divided each of these generations into two halves of roughly equal length.

The results are shown in figure 3. For the years and ages available, it shows for all households largely the same generational patterns that figure 2 shows for families—namely, a steady rise in cohort-group income at every age through the early Boomers (born 1943–51). With late Boomers (born, 1952–60) and early Xers (born, 1961–70), the income trajectory begins to plunge beneath those of earlier cohorts at many or even most ages. The main exceptions are the ages when these later-born cohort groups reached the expansionary peak years of 1998 to 2001—that is, in a fashion similar to what we noticed in figure 2, when they briefly reached all-time peaks for their age. Figure 4 translates these same numbers into a more readable index. At every age in figure 4, the average median income for all half-generations equals 100. We will refer to figures 3 and 4 in the later sections.

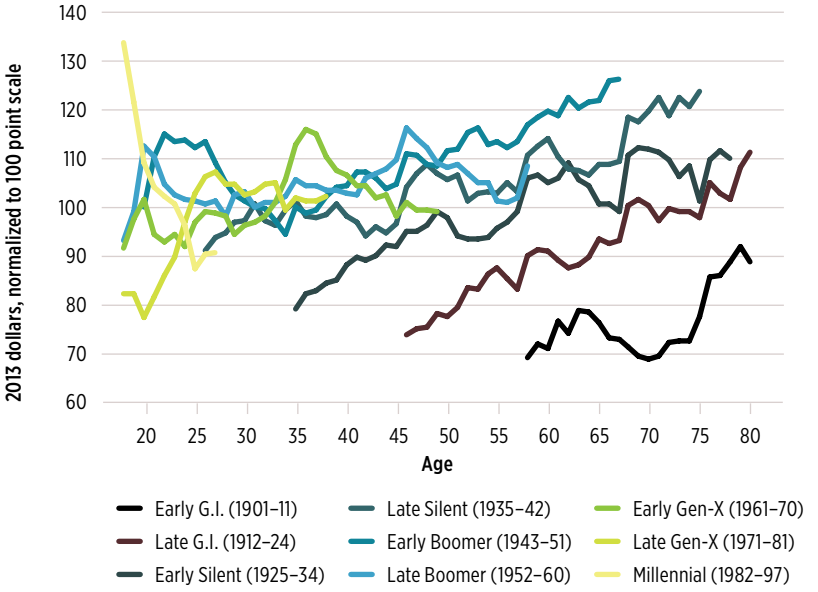
So much for income. Now let's do for median net worth in figure 1 what we just did for income—break the series down into trends by age. Because we have many fewer data points for median net worth, we cannot construct continuous cohort-group series. Instead, we simply show, in figure 5, a comparison by age of median net worth in three different years: 1983, 1995, and 2013.

Here again, we see a striking divergence in generational trends that don't appear at all in figure 1. While the median net worth for all households rose only slightly between 1995 and 2013 (+7 percent), the medians for households under age 35 and age 35–44 both fell by over 10 percent, and the medians for households age 65–74 and age 75 and over rose by over 100 percent. Or to look at it another way: The same householders (born 1939–48) who were age 35 to 44 in 1983, when their median wealth was 57 percent of that of age 65–74 households, filled the 65–74 age bracket in 2013, when the median wealth of the younger bracket was only 20 percent of that of the older bracket.

6 Specifically, the age of the head determined household membership in cohort groups. The median income of all members of a cohort in a given year was then plotted according to their combined average age. See the data and methods section for further details.

7 For generational birth dates, see Howe and Strauss (1991) and Howe and Strauss (1997).

Figure 4. Life-cycle income for half-cohorts, normalized to 100 point scale, in constant 2013 dollars



Note: All series deflated to 2013 dollars with CPI-U-RS.
Source: IPUMS-CPS (1964–2014).

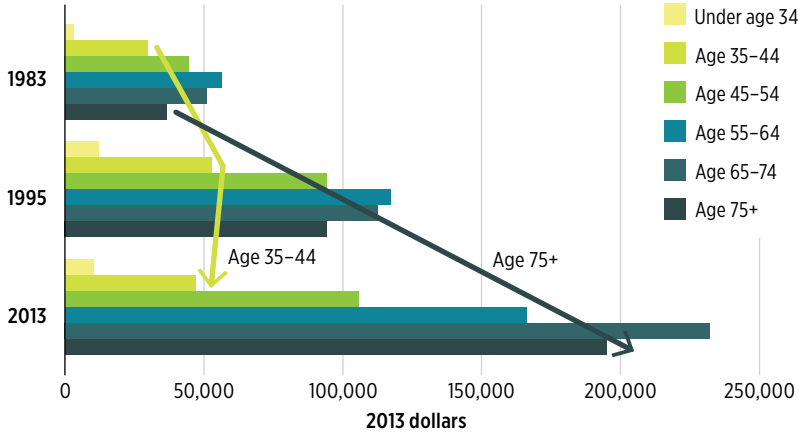
Why do younger cohort groups, once again, lag so far behind in their median net worth trajectories? One obvious explanation is the inferior median income growth of younger cohorts: With less income, there's less to save. Another is the rising degree of income inequality within younger cohorts.[8]

Why is the emerging generational disparity in net worth even more dramatic than the disparity in income? Here we could mention several possibilities. According to James Duesenberry's (1949) relative income hypothesis,[9] an individual's attitude toward income and saving is dictated by that individual's income relative to others—and younger cohorts have saved at lower rates to the extent they've had trouble keeping up with the consumption of the cohort just ahead of them. This perspective may have received recent support from the research by Barry Cynamon and Steven Fazzari (2014), showing that savings rates differentially declined among nonaffluent (read: younger) households in

8 For more detail on this point, see figure 8 in this paper, which shows Gini coefficients for half-cohorts.

9 However, see also Frank (2005).

Figure 5. Real median family net worth, by age: 1983 to 2013



Note: All series deflated to 2013 dollars with CPI-U-RS.
Source: SCF, Fed Bulletin (2013 and earlier years).

the 20 years preceding 2008. Post-2008, with steep deleveraging among the nonaffluent, this differential has finally started to show up in a sharp rich-up versus poor-down divide in consumption.

To explain the unusual shifts in median net worth by age, one might also point to the timing of catastrophic asset-price declines. The exceptionally long "great moderation" preceding the exceptionally severe crash of 2008 has worked to the benefit of anyone retiring and cashing out just before that date—and to the detriment of younger cohorts, especially those with 10 to 30 years still ahead before retirement.

Weighing and evaluating such explanations requires us to put together some sort of coherent narrative of the postwar era. But it can't be a single narrative. Rather, it needs to be a sequence of generational biographies, allowing us to glimpse—however briefly—each generation as a collective story. Let's look at income and wealth accumulation from their perspective—considering not just the quantitative but also the qualitative side of their experiences: how each generation was viewed by others, how it redefined the American Dream of economic success, how it devised new strategies to achieve that success, and how it was helped or hurt along the way by external events.

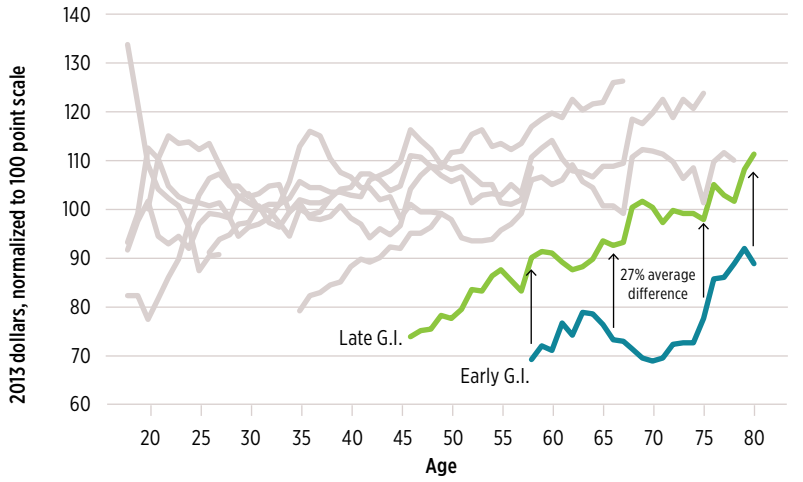
So we turn now to today's living social generations, starting with the G.I.s and ending (for now) with the Millennials.

The G.I. Generation and the "Triumph of the Squares"

The G.I. generation (born 1901–24)—also dubbed the "Greatest Generation" by Tom Brokaw (2001)—today comprises some four million Americans mostly in their 90s. They can be roughly defined as Americans who were born just too late to serve in World War I, but early enough to experience the Great Depression or the climax of World War II as they came of age. John Kennedy, their first President, defined them as "born in this century" (1961). And indeed, their collective life story virtually coincides with the "American Century" of unprecedented global power, technological progress, and rising living standards.

By the time they reached their 50s and 60s (the youngest age at which the data allow us to make the comparison), the typical G.I. adult enjoyed a colossal jump of roughly 50 percent in real family income over the previous ("lost") generation at the same age. (See figure 2.) They showed ongoing progress from first wave to last wave as well. As shown in figure 6, late G.I.s achieved a median income that was 27 percent higher on average than their early G.I.

Figure 6. Life-cycle income for early and late G.I.s, normalized to 100 point scale, in constant 2013 dollars



Note: All series deflated to 2013 dollars with CPI-U-RS.
Source: IPUMS-CPS (1964–2014).

peers born just a decade earlier.[10] This constitutes the largest percentage growth in median income between any of the half-generations born since 1901.

What's more, the G.I.s knew they were better off. One of their economists (Simon Kuznets) invented the term "GNP" to measure this affluence (Dickinson 2011), and another (John Galbraith 1958) invented the term "Affluent Society" in the 1950s to describe it. Yet few G.I.s equated rising material production with the mere sating of individual appetites, but rather as a means to build a more secure "free world" in which the "common man" (another phrase they popularized[11]) would be vastly better fed, housed, educated, leisured, and insured than ever before. At the peak of their power, in the mid-1960s, they largely succeeded. In the decades since, arguably, we struggle to register any improvement on some of these metrics. Like putting a man on the moon, we look back and wonder just how they did it.

We all know about the gigantic civic investments the G.I.s made in America's future, resulting in much of the global order and prosperity the world enjoys today. But hardly anyone asks who invested in them to make them turn out that way.

The story starts back in their childhood, when little G.I.s were fussed over by protective parents determined to raise up kids as good as the Lost generation had been bad. Much of this was the focus of the progressive movement. Youth clubs, vitamins, pasteurized milk, laws to keep kids in school and out of the labor force—even Prohibition—were all efforts to keep these kids away from the danger and decadence of older Americans.

These G.I.s responded by coming of age as the straight-arrow achievers that adults had been hoping for. By the mid-1920s on college campuses, cynicism and selfishness were out, optimism and cooperation were in. In the years that followed, G.I.s became the Civilian Conservation Corps dam-builders and tree-planters, the heroes of Iwo Jima and D-Day—in fact, the most uniformed generation per capita in American history.

Later, after the crisis was over, G.I.s just kept on building: interstates, suburbs, missiles, miracle vaccines, trips to the moon, and the Great Society. Eventually, their "best and brightest" hubris about guns and butter, beating benchmarks, and "growthsmanship" made them a target for younger generations. Many of the G.I.'s own Boomer kids, raised during the rising tide of their success, found their parents implacable and unfeeling, piling block on block with no moral purpose. As G.I.s entered elderhood in the late 1960s, many chose to separate themselves from their children and congregate in vast

10 Percent change was calculated using the average normalized median income of early G.I.s relative to late G.I.s. at the same ages.

11 Most notably, George H. Gallup; Google Ngram shows use of the phrase peaking between 1940 and 1970.

age-segregated desert communities with names like Leisure World and Sun City rather than endure their celebration of selfishness—what G.I.s have always considered hateful to their life-mission to homogenize and clean up the world.

Now when you look at the entire G.I. life story, you see a lot that explains their collective leap in living standards.

For starters, they were a generation of achievers. They represented the single biggest gain in educational attainment in U.S. history—from 10 percent of their first cohorts getting high school diplomas to 50 percent of their last-born cohorts (Goldin and Katz 2008). After the war, thanks to the G.I. bill, they also became the first generation whose middle class could enter college in large numbers. G.I.s eventually won 133 Nobel Prizes, accounting for 38 percent all Nobels ever awarded to Americans since 1901.[12]

They believed strongly in community. G.I.s were joiners who defined citizenship in terms of cooperation. In their youth, they voted overwhelmingly for the New Deal and became America's biggest-ever union generation. They voted for generous subsidies that helped push up homeownership rates: The share of owner-occupied homes rose from 46 percent in the 1920s to 62 percent by the mid-1960s—about where it is today (U.S. Census Bureau 2011b). They also greatly expanded the use of employer-sponsored pension plans and backed minimum wage laws and high marginal tax rates.

Income equality grew on their watch, which hugely boosted the growth in the middle-class median. Most measures in income inequality show a rapid fall in the 1930s and 1940s (when they were coming of age) and a rapid climb in the 1970s (when they were retiring) (Atkinson, Picketty, and Saez 2011). According to census, the income Gini coefficient for all U.S. families flattened out at a historically low level from the late 1950s to late 1960s (hitting its all-time low in 1968),[13] just as this generation reached its peak earning years. As we will see later (see figure 8), the Gini coefficient for this generation specifically was lower than that of any later-born generation at the same age.

They brought these attitudes with them into elderhood. Called "junior citizens" in their youth, G.I.s became known as "senior citizens" when they began retiring in the mid-1960s and gave birth to a new label for that phase of life. Membership in an elder organization such as AARP—something unknown to lost generation elders in the early 1960s—became nearly universal for G.I. elders by the early 1980s. The G.I. reputation for civic dedication also triggered a vast expansion in senior entitlements from 1965 to 1972, including Medicare, Medicaid, and much higher Social Security benefit levels plus 100 percent cost-of-living adjustment (COLA) indexing. This gave a further boost

12 See the official website of the Nobel Prize, **www.nobelprize.org**.

13 For historical Gini index data for families, see U.S. Census Bureau n.d.

to their income late in life, some of it measured by the census income figures and some of it not.

Today, most of this generation has passed on. But they live on in the imagination of younger people who have grown up in their civic shadow: They are the special generation whom everyone counted on to team up and push forward when our nation really needed it. Their American Dream is perhaps best captured by the returning soldier's wish in *The Best Years of Our Lives* (1946): "All I want's a good job, a mild future, a little house big enough for me and my wife." To which the movie's (and the federal government's) answer was: "I don't think that's too much to ask." Many of their civic efforts were devoted to making that vision possible for all Americans—though whether that possibility still extends to today's younger generations has since become an open question.

The Silent Generation, "The Lucky Few"

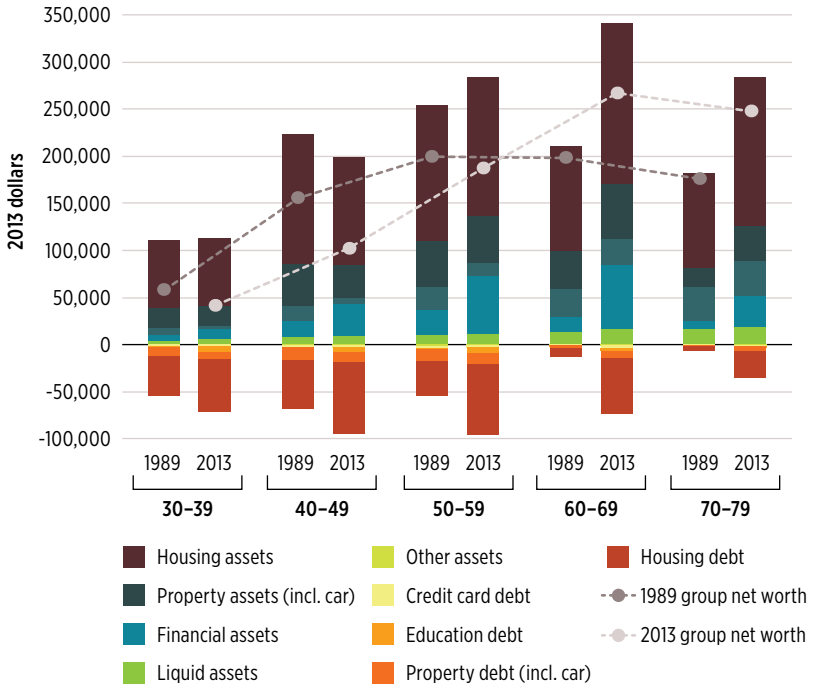
The Silent generation (born 1925–42) today comprises roughly 20 million adults in their 70s and 80s. Their age location in history sandwiches them awkwardly between two better-known generations: They were born just too late to be World War II heroes and just too early to join the '60s youth protests. In their personal lives, this age location has been a source of tension. By the time the Silent were entering midlife, they spearheaded the divorce revolution and popularized (thanks, Gail Sheehy 1976) the term "midlife crisis." But in their economic lives, this age location has been very good to them—and given them a lifetime ride on the up-escalator coming off the American High.

As we see in figures 3 and 4, their income reached new heights over the G.I. generation before them. The late Silent reached their peak median income in their late 40s and early 50s at around $69,000 a year, soaring beyond their early Silent and late-G.I. peers (who peaked around $63,000 and $54,000, respectively). At age 49, the typical late Silent household was making $6,000 more than the typical early Gen-X household at that age, reflecting the good fortune of their historical timing.

The Silent started out as the children of crisis. They grew up while older people were fighting wars and making great sacrifices on their behalf. Childrearing in America, already more protective for the G.I.s, approached the point of suffocation. Later in life, many Silent[14] blamed strictly behavioral child-rearing (often shaped by the advice of Dr. John Watson 1928) for over-socializing them early in life.

14 See for example Eisler (1986).

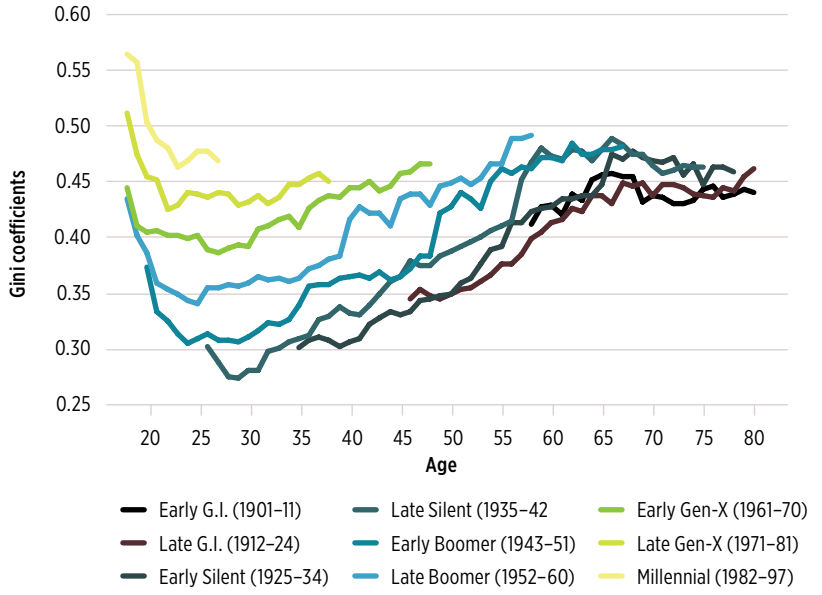
Figure 7. Average net worth and composition of assets and liabilities of the middle 60 percent of the wealth distribution by select 10-year age groupings: 1989 and 2013



Note: All series deflated to 2013 dollars with CPI-U-RS.
Source: SCF (1989 and 2013).

When the Silent began coming of age after World War II, they tiptoed cautiously in a post-crisis social order that no one wanted to disturb. Unlike the G.I.s, they rarely talked about "changing the system," but instead about "working within the system." Because they didn't want anything to go on their "permanent records" and kept their heads down during the McCarthy era, *Time* gave them the label "Silent" in a famous 1951 essay (*Time* 1951). They were also careful in the labor market. *Fortune*'s story on the "College Class of '49" was subtitled "Taking No Chances" (*Fortune* 1949). When they went to job interviews, their first questions were about pension plans. They emulated their powerful G.I. elders by marrying and having babies incredibly young—in fact, younger on average than any other generation in American history since

Figure 8. Gini coefficients for half cohorts, by average age



Note: All series deflated to 2013 dollars with CPI-U-RS.
Source: IPUMS-CPS (1964–2014).

at least the Civil War.[15]

Unlike the G.I.s, the Silent didn't have to wait for a depression or war to end. A new "booming" economy was ready to join right out of school. Demographer Richard Easterlin (1980), in *Birth and Fortune*, called them the "lucky" or "fortunate" generation for their great timing. Easterlin noted that a remarkable feature of the Sputnik era was how the typical young man could earn more by age 30 than the average wages for men of all ages in his profession—and could certainly live better than most "retired" elders. He also noted that since the mid-1970s, the economic conditions facing young late-wave Boomers were becoming much tougher.

At the time, Easterlin hypothesized that the Silent—being small in number because of low birthrates during the 1930s and early '40s—benefited from labor markets that bid up their wages in an era when young adults were relatively scarce. Later, as they retired, their small size (next to the large FICA-paying generation

15 For historical census data on age at first marriage, see U.S. Census Bureau (2004).

following them) has certainly helped make their pay-as-you-go Social Security and Medicare benefits seem more affordable. Sociologist Elwood Carlson (2008) echoes Easterlin's thesis in his recent book, *The Lucky Few: Between the Greatest Generation and the Baby Boom*.

Yet the arrival of young-adult Gen Xers in the 1980s and '90s, who were also small in number but have fared much worse in the economy, throws this explanation into doubt. Numbers helped, but what helped the Silent even more was, again, their timing. Taught to play by the rules, this generation discovered at every age—from the moment they married (at a median age of 21 in 1960) and purchased a house and car (soon thereafter)—that playing by the rules usually worked very well for them.

As the Silent have aged, their perfect timing has not let them down. Many of them locked in fixed 4.5 percent mortgages on their first homes in the 1960s just before inflation accelerated—giving them many years of deeply negative real interest rates. In the large corporations where so many of them worked, they signed up young for the defined-benefit pension plans their G.I. managers started—the same plans that have been frozen for Boomers and disbanded for younger generations. Their midlife high-savings decades roughly coincided, in 1980s and '90s, with perhaps the greatest bull market ever in both stocks and bonds. And after riding this bull, the Silent retired and sold out just before the crash hit. The last Silent cohort reached age 65 in 2007.

This is the only living generation that could half-believe, along with Woody Allen, that "80 percent of life is just showing up," a joke that makes most Xers simply shake their heads.

In terms of national leadership, the Silent—unlike the G.I.s—are not a powerful generation. According to the late management guru Warren Bennis (2009), they redefined leadership as more "maestro" than "macho." They are the only generation in American history never to occupy the White House. In Presidents, we jumped from George Bush Sr., the World War II veteran, to Baby Boomer Bill Clinton.

Yet they are without doubt the healthiest and most educated generation of elders that ever lived—and, of course, the wealthiest. Coming of age 50 years ago, they quickly amassed more wealth than the seniors of that era. (Back in the early 1960s, poverty was considered an affliction of the old, not the young.[16]) Even over just the last 25 years, the shift in the age-wealth curve has been dramatic. As figure 7 shows, the Silent generation in their 70s have a median net worth of $248,391 in 2013, nearly $72,000 higher than people that age had in 1989. In 2013, astoundingly, their net worth is more than six times larger than that of households in their 30s ($41,062). And their total debt is less than half as large.

16 For historical Census data on poverty status, see U.S. Census Bureau (2015c).

Given their material good fortune, along with their instinct to help others in need, the Silent as elders have become economic anchors for America's new renaissance in multigenerational family living. Many routinely pay for extended-family vacations or subsidize their grown Boomer or Xer kids. Many have set up college trust funds for their grandkids—and indeed, a record share have assumed formal custody of them (U.S. Census Bureau 2011a). Most are worried about the economic challenges facing their families—and wonder why economic success has become so much harder for them to attain.

The Boom Generation, "What a Long Strange Trip"

Boomers (born 1943–60) today comprise 65 million adults mostly in their 50s and 60s. As a social generation, Boomers are a bit older than the oft-cited Census Bureau definition (1946–64), which merely refers to a "baby boom" fertility rate hump. If you remember World War II, were out of college when JFK was shot, and recall Woodstock as something "kids" were doing, you're too old to be a Boomer. If you can't recall the moment JFK was shot, nor Jim, Jimi, or Janice when they were still alive, you're too young.

However you date them, we all know the Boomers' life story. It's as though no phase of life means anything until Boomers pass through it and can tell other generations all about it. They started out as feed-on-demand Dr. Spock babies, then grew into the indulged Beaver Cleavers of the '50s, then the college and inner-city rioters of the late '60s, and finally ended up as the young family-values moms and dads of the early '80s.

Along the way—somewhere between LBJ and Reagan, between hippie and yuppie—Boomers shook the windows and rattled the walls (to paraphrase Bob Dylan) of everything their parents had built. In so doing, this "generation" (a word they repopularized) became especially well-known for its cultivation of self and its carelessness about material wealth. It's no coincidence that Boomers mark first the apogee, and then the decline, in generational progress as measured by real-dollar income.

First-wave Boomers born mainly in the mid-1940s have done best, but late-wave Boomers born mainly in the mid- to late 1950s are underperforming the first-wavers at nearly every age (see figures 3 and 4). Early Boomers at age 53 reached their peak median income at $74,000, higher than any other half-generation born earlier or later. And ever since, they have exceeded all other half-generations in median income for their age. By contrast, late Boomers hit their peak much earlier (at age 45) with a median income of $72,000—and have been on a downward slide, lagging under first-wavers, ever since.

One explanation for this turnaround is simple age location. First-wave Boomers tended to emulate the Silent: They followed the rules more carefully, went to school longer, and got married earlier. Late-wave Boomers—who hit the social turmoil of the '60s at progressively younger ages—got into more trouble, graduated less often from college (men, especially), and married much later (if at all). The difference in age location also extends to the economy. Most first-wavers launched careers (in 1972 or before) during the revved-up go-go years. Most late-wavers launched careers (in 1973 or after) when the economy was stagflating.

Yet a fuller explanation requires mentioning three collective personality traits that define Boomers as a generation—and that gathered force moving from first wave to last.

The first Boomer trait is their famous individualism. Boomers have long behaved as if they didn't need institutions or each other. This is the first generation of women, for example, to regard itself as essentially economically independent. Harvard sociologist Robert Putnam explains much of the growing shift away from civic and group participation in postwar America as a generational phenomenon—and one that began with Boomers (Putnam 2000). This individualism helps explain why Boomers have avoided the group security offered by unions or paternalistic benefit plans—and why, as voters, Boomers have been generally tolerant of a growing rich-versus-poor spread in America's income distribution, which of course widens the gap between mean and median.

In fact, the coming of age of Boomers in the late '60s and early '70s heralded a notable shift toward growing income gaps in the late 20th century—and the moment when the overall U.S. income Gini coefficient initiated a secular rising trend. The story told by half-generation Gini coefficients (see figure 8), though complex, is clear enough in its basic outline. For most of their lives, the Silent (except for late Silent past their mid-50s) have tracked the low Ginis of the G.I.s fairly well. Early Boomers initiated a bigger jump upward at earlier ages. And late Boomers are the first half generation to show a higher Gini at every age than any earlier-born cohort group.

The second trait is their attraction to personal risk-taking. As youth, Boomers pushed the envelope on danger, propelling rates of accidents, suicide, violent crime, drug use, unmarried pregnancy, and STDs to levels that seemed shockingly high at the time.[17] Today, many of those indicators are rising

17 For CDC data on suicides and accidental mortality by age, see National Center for Health Statistics (2015); on crime, see overview by Fox (1996); on sexual behavior, see overview by Caron and Moskey (2002).

swiftly for midlife Americans, even as they fall among youth.[18] Risk-taking has obvious implications for economic decisionmaking—for example, portfolio selection. There's also mounting evidence that Boomers have higher rates of lifestyle-related chronic disease than the previous generation at the same age (King et al. 2013). This would mark a reversal of health gains achieved by the G.I.s and Silent as elders, and it may portend a decline in the Boomers' productivity and employability as they age—as well as a further acceleration in disability and health benefit spending.

Finally, there is the Boomers' values orientation. This generation has always preferred dividing the world into right versus wrong, good versus bad. They came of age creating the "counterculture," whose purpose was to judge their parents. Now they lead the "culture wars," whose purpose is to judge each other. This strong values orientation makes Boomers suspicious of purely material measures of life success. According to a MetLife (2011) survey, Boomers are considerably *less* likely than other generations to agree that the American Dream means "exceeding your parents' standard of living." And according to U.S. Trust (2013), Boomers are a lot more likely than prior generations to say that giving their kids "good values" is more important than providing them with a material inheritance. Even high-end Boomers agree with this.

Today, Boomers are busy redefining retirement—or getting ready to redefine it. From first wave to last, G.I.s entered retirement with more money than they expected in an era of expanding benefits. From first wave to last, Boomers are moving in the other direction. In 2013, the median early Boomer had a median net worth ($267,520) that exceeded that of all other half generations and was 36 percent higher than what their parents had at roughly the same age in 1989 ($198,493) (see figure 8). In contrast, late Boomers represent the beginning of a trend toward lower net worth totals. Late Boomers (defined here as all households in their 50s) had a median net worth of $187,214—6 percent lower than what Americans in their 50s had in 1989, due in large part to their much larger housing debt. Along with less wealth, more debt, and lower pre-retirement income, late Boomers are sharply less likely to qualify for defined-benefit pensions and face receding benefit generosity from Social Security.[19]

As for the G.I. trend toward earlier retirement, that too is being reversed. The employment rate for Americans age 65 to 69, which has already been rising steadily since 2008 (despite the recession) as early Boomers move past 65, will almost certainly continue to rise once late Boomers arrive.

The G.I.s wanted to live away from their kids and near their peers—which

18 For overview of trends, see Bahrampour (2013); Elinson (2015); and Nagourney (2013).

19 Under current law, the "normal" age for receiving full Social Security full retirement benefits is 66 for Americans born from 1943 to 1954, but it then rises to age 67 for those born in 1960 or later.

led to the construction of vast age-restricted desert communities like Sun City and Leisure World. Boomers want to live away from their peers and near their kids—this, indeed, is one of primary reasons they prefer to "age in place" in the suburbs (Keenan 2010). As developers prep their active-adult communities for the coming late wave, they can expect less affluence, somewhat greater ethnic diversity, a weaker middle class, and, perhaps eventually, an abandonment of the very word "retirement."

All their lives, Boomers have touted a lofty vision of the American Dream that eschews the material in favor of a deeper, more meaningful definition of both work and play. That's a good thing, because many of them (late-wavers, especially) will have to work much longer than their parents did—or find fulfillment in "priceless" play that can be purchased at bargain prices.

Generation X: Once Xtreme, Now Exhausted

Generation X (born 1961–81) today comprises roughly 87 million adults in their early 30s to their early 50s. The very name "X" has an identity-cloaking quality, reflecting the fact that many Xers feel little generational center of gravity. They are, first of all, the most immigrant generation per capita born in the 20th century. Early on, they also sensed that they had no middle class—and were told repeatedly by older generations that collectively they had no future (Howe and Strauss 1993, chapter 2). A famous 1990 *Time* magazine cover photo (O'Brien 1990) illustrates, early on, how many Xers entering adulthood were likely to see themselves—dressed in black, certainly not euphoric, and all looking in different directions, as if to advertise that they have nothing in common. In interviews, young Xers tended to agree with dark predictions of their generation's prospects—which meant that to be successful you had to take plenty of risks and be different from your peers.

The data suggest that the Xers' early intuition was largely correct. Of every half-generation that has as yet fully entered the labor market, they show (see figure 8) the highest levels of income inequality, with late Xers even more unequal at every age than early Xers. (To be sure, we should be cautious with these cross-sectional Gini data, since some of the rise may reflect generational shifts in the year-to-year stability of personal income.)

Moreover, in terms of median household income, Xers are having trouble keeping up with their parents and older siblings. Through their 30s, early and late Gen Xers appeared to be roughly on track to match the incomes of the two halves of the Boomers. In fact, Pew found that when comparing the income of Xers to their own parents in their 30s, a majority were exceeding the previous generation (The Pew Charitable Trusts 2014). But that was before the Great

Recession hit. In their late 40s, the median income of early Xers slipped below both waves of Boomers as well as the late Silent (see figure 4). When we compare each Xer half-generation with the half-generations most likely to include their parents (early X with late Silent and early Boom; and late X with early and late Boom), it's clear that the typical Xer household is today approaching and passing age 40 or 50 making less than their parents were at the same age.

Gen Xers first arrived as toddlers in the early 1960s, when the increasingly indulgent parenting style enjoyed by Boomer kids became totally hands-off. Institutions that once protected kids no longer seemed to work in the '60s and '70s. Schools were breaking down, and the divorce rate soared. What's more, starting in the early '60s, adults didn't want to have kids anymore. The total fertility rate plummeted, hitting an all-time low in 1976, making this known as a "baby bust" generation.

Xers learned young that they couldn't trust older people and institutions to look out for their best interests. They needed to be resilient survivors who could trust their own instincts. While Boomers have always focused on their inner lives, Gen Xers tend to focus on bottom-line outcomes. For the last several decades, the UCLA college freshman survey[20] has been asking students what life goals they consider important. Through the early 1970s (when Boomers were college freshmen), a three-to-one majority cited "developing a meaningful philosophy in life" as most important rather than "being very well off financially." When Xers entered college in the late 1970s, those priorities reversed.

Entering the workplace in the 1980s and '90s, young Xers encountered a generally buoyant economy that held lopsided rewards. At the high end, there was Wall Street and the allure of the entrepreneur in a newly deregulated economy. At the low end, rising import competition from cheap labor abroad and a massive immigration surge bringing in cheap labor from abroad pulled earnings down. The minimum wage (in real dollars) was allowed to sink. Entry-level union jobs began instituting two-tier wage scales, and legislators began scrapping job training programs and welfare benefits that had remained in place during the Boomer youth era.

Raised as kids to take care of themselves, most young Xers embraced the high-turnover, no-safety net, free-agency lifestyle. Many gladly cashed out their workplace benefits, triggering the '90s-era trend toward opt-in "cafeteria" and "total rewards" pay packages (McCluskey 2002). At an early age, they dominated temp work—a sector that today is beginning to age with them. "McJobs" became the most celebrated neologism readers took away from Douglas Coupland's (1991) generation-naming novel.

20 *The American Freshman* (Los Angeles: Higher Education Research Institute) published annually, yearly surveys since 1966.

The first wave of Generation X (born in the 1960s, the so-called Atari or Reagan Xers) started out at a tough time, in the grim shadow of the Volcker recession. By contrast, the last wave (born in the 1970s, the so-called Nintendo or Clinton Xers) entered the workforce during the Roaring '90s, giddy years of "irrational exuberance" in which market valuations hit preposterous peaks. Millions of first-wavers at age 35 could at last hope that maybe the future wouldn't totally suck after all. Millions of last-wavers at age 25 started out daydreaming about seven–figure stock options.

Yet despite all the "end of history" and "Dow 36,000" talk, precious few Xers—first wave or last—actually struck it rich. Under the impact of successive booms and busts, most struggled to afford a family or keep their home. While aspiring to become the capitalist "rich dad" they wished they had (Walker 2002), most could not keep up with the actual wage-slave "poor dad" they sometimes had to boomerang back home to.

Then came the Great Recession, which hit Xers much harder in percentage wealth and income declines than any older generation (see figure 9). And no wonder. They had invested aggressively in stocks with the highest P/E ratios, the ones that crashed hardest. More than Boomers, Xers had bought late into the real-estate boom at punishing prices—and in exurban regions where the price declines were steepest. Since the crash, Xers in their 30s and 40s have experienced the biggest decline in homeownership (U.S. Census Bureau 2015d)[21]—and to this day are the most likely to be underwater on the homes they still own (Swanson 2014).

Their net worth shows the damage. In 2013, Xers in their 40s have a median net worth of $102,668—34 percent lower than what late Silent and early Boomers held when they were in their 40s. Again, homeownership has not helped them—Xers owe a lot more on homes that are worth a lot less. The typical Xer in their 40s has $50,000 less home equity than what the typical American in their 40s had in 1989 (see figure 7).

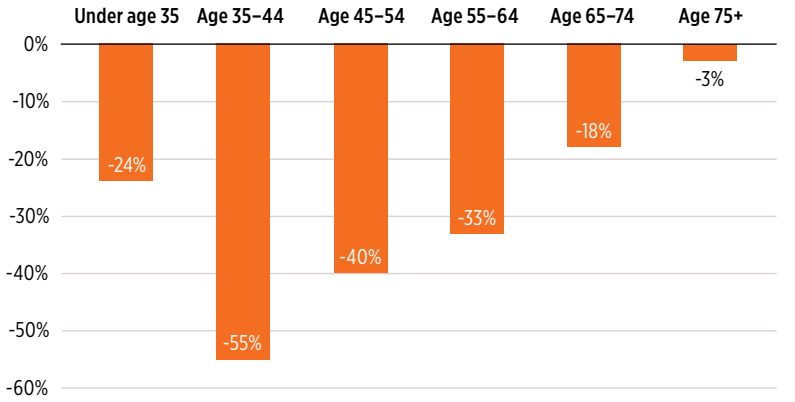
Meanwhile, despite strong recent overall employment numbers, the jobs recovery for Gen Xers remains uncertain and incomplete. While the number of (mostly) Boomers age 55 and over with full-time jobs has risen by about 4.5 million from the fall of 2007 to the spring of 2015, the number of (mostly) Xers age 25 to 55 with full-time jobs has *declined* by about 6.0 million.[22]

There is some truth to the benign view that many Gen Xers are willingly choosing to downshift, work less, and lead a more do-it-yourself lifestyle. In an era when steady employment is a struggle to find, more Xers are prioritizing time with their families over longer hours at the office. They see traditional

21 See also Emmons and Noeth (2014).

22 For labor force statistics by age, see Bureau of Labor Statistics (2015).

Figure 9. Change in real median household net worth, by age: 2007 to 2010



Source: SCF, Fed Bulletin (2007 and 2010).

full-time positions as a burden rather than a benefit. This is especially true for Xer men who are seeking to be much more involved fathers than their own parents were. These forces are encouraging many of them to withdraw from the labor market (Furchtgott-Roth 2014). But for millions, we're talking about involuntary unemployment or underemployment leading over time to loss of skills and detachment from the labor force. This is especially true for minority, immigrant, or low-skilled Xers, who were most likely to have lost most or all their wealth since 2008 and who have been the slowest to recover any of it. The aggregate statistics (Pitts, Robertson, and Terry 2014) read like the gigantic auto accident Xers always feared lay somewhere in their future.

Helping this generation get back on track economically is one of most important policy challenges America faces over the next decade.

The Millennial Generation, "Keep Calm and Carry On"

The Millennial generation (born 1982–2004) today comprises roughly 100 million people mostly in their teens and 20s. Their attitudes and behaviors have been scrutinized from every angle, with labels ranging from "the Me Me Me generation" (Stein 2013) to "Generation Nice" (Tanenhaus 2014). When it comes to the economy, however, this generation's story is straightforward: The oldest Millennials

began graduating from high school in 2000, from college in 2004, and with master's degrees in 2006. The Great Recession has thus totally dominated their view of the economy in general and their career aspirations in particular.

Their leading edge has certainly been hit hard. Millennials through age 27 have median incomes lower—in most instances by thousands of dollars—than even the late Silent, the oldest cohort we can track at the same average ages (see figures 3 and 4). While this is certainly not an auspicious start, it's probably too early in the lives of Millennials to read too much into these numbers—especially considering the growing share of adults in their late 20s (now roughly half[23]) who are neither a "head" nor "co-head" of household and are thus unrepresented in them.

The first Millennials were born in the early 1980s. They have no memory of the Consciousness Revolution that was so defining for coming-of-age Boomers nor the hands-off parenting era in which Gen-X children were raised. By the time Millennials came onto the scene, social and family experimentation was ebbing. Young children began to receive more structure and protection. In the early 1980s, "Baby on Board" signs began to appear, attached to new child-friendly minivans loaded with safety gadgets. With "family values" ascendant, Boomer (and later Xer) parents began spending far more time with their kids than their own parents ever spent with them (Milkie, Nomaguchi, and Denny 2015). Child safety and child abuse became hot topics as rates of divorce (Wolfers 2014), abortion (Jones and Jerman 2014), and violence and abuse against children all fell steadily (Finkelhor and Jones 2012).

Meanwhile, the media spotlight honed in on Millennials' academic achievement. The "Goals 2000" movement—targeting first-wave Millennials born in 1982—demanded improved student achievement from the high school class of 2000. Educators spoke of raising standards and No Child Left Behind. By the mid-1990s, politicians were defining adult issues (from tax cuts to Internet access) in terms of their effects on kids and teens.

Given all this adult attention, it's no wonder that this rising generation has developed a sense of specialness, to themselves, to their parents, and to the wider community. As we might expect, this location in history has had a major impact on Millennials' collective personality and generational behavior.

Many media reports (Lowrey 2013) about Millennials' economic prospects have focused exclusively on how the Great Recession is likely to reduce their average earnings for many years to come, no matter how much the economy improves. This is probably correct. It's also true that the majority of Millennials looking for

23 The share of 25- to 29-year-olds who are neither living alone nor heading a family has grown from 36 percent in 2000 to 48 percent in 2014; most of this increase is equally divided between growth in young people living with parents and young people living with friends. See U.S. Census Bureau (2015a).

work have as yet been unable to find secure and salaried careers—and thus are leading lives that are literally on hold. A rising share of young adults age 30 and under are putting off marriages, births, home purchases, car purchases, and relocation. Notably, this age group shows by far the biggest jump between 2008 to 2014—from 25 to 49 percent (Morin and Motel 2012)—in the share of Americans who consider themselves "lower" or "lower-middle" class.

Yet there's more to the story. Along the way, the tough economy is also reinforcing generational traits that Millennials possessed even before the recession began.

Millennials were risk-averse before—and now even more so. Since Millennials began entering their teen years in the mid-1990s, rates of personal risk-taking among this age bracket have plummeted. Rates of violent youth crime and teen pregnancy have both declined dramatically (Child Trends Databank 2015b),[24] while rates of teen drinking and smoking have dropped to record lows.[25] Of the 46 "youth risk indicators" that have been continuously monitored by the Centers for Disease Control from 1995 to 2013, nearly all of them (42) have improved (Centers for Disease Control and Prevention 2015). As they have grown older, this risk aversion continues. Over the past decade, young adults in their 20s have experienced rapidly falling accident rates (auto accidents especially (National Highway Traffic Safety Administration 2014)), a shrinking share of fatal drug overdoses (Chen, Hedegaard, and Warner 2014), and falling rates of crime victimization (Langton and Truman 2014) and of incarceration (Carson 2014).

Contrary to stereotype, most Millennials try to avoid economic risks as well. Most aspire to a stable career within a big corporation (*Millennials in the Workplace* 2014)—and, remarkably, a higher share of them think job security is "extremely important" than either Xers or Boomers (Pew Research Center 2013b). The share of under-30 Americans who own a private business has recently fallen to a 24-year low,[26] according to Federal Reserve data, with most young adults citing "fear of failure" as the biggest roadblock to entrepreneurship (Kelley et al. 2013). Though media reports often portray Millennials as spurning the 9-to-5 working world in favor of freelancing, the reality is that many of these young people are "permalancing" out of economic necessity and would prefer the security of a permanent position.

Once on the job, they want to max out on benefits from pensions to insurance. According to DC funds data (Smialek 2014), they have the most conservative portfolio selection of any age bracket under age 65. Though they

24 See also, Butts (2013); Child Trends Databank (2014); see also Khan (2014).

25 For data on drug and tobacco trends, see Johnston et al. (2014).

26 Data from the SCF, available at **www.federalreserve.gov/econresdata/scf/scfindex.htm**; see Simon and Barr (2015).

are accumulating record levels of college debt, Millennials are actually less likely to have credit card, auto, or housing debt (and incur fewer delinquencies on that debt) than Gen Xers were at the same age (Dettling and Hsu 2014).

Millennials were close to their families before—and now even more so. A full 24 percent (Fry and Passel 2014) of 25- to 34-year-olds now live with their parents or other family members, up from an all-time historical low of only 11 percent back in 1980, when Boomers filled that age bracket. It's not just joblessness that is driving this trend, since it started long before the Great Recession. It also reflects the closing of a generational rift that once split families on so many "values" topics. According to AARP research, Millennials are more comfortable discussing sensitive subjects with their parents—namely, their emotional lives (friends, relationships, dreams) and their financial lives (careers, spending, savings)—than Boomers were when they were young adults (Huber 2012).

The re-emergence of the extended family has clear economic implications for young-adult Millennials. They are not only more likely to live in or near their parents' home, but also are more likely to need parental help in investing in their future and backstopping their commitments. Over the past 15 years, parents (and other family members, including grandparents) are paying more to help with college tuition, are more often covering living expenses, and are more often cosigning leases, loans, and mortgages. Between just 2005 and 2012, according to one survey, the share of adults who are financially providing for their own adult children has grown from 42 to 48 percent (Parker and Patten 2013). According to another, 44 percent of parents of Millennials report giving them "regular" or "frequent" financial support—while only 14 percent of the parents recall receiving such support when they were in their 20s (Clark University 2013).

Millennials were achievement-oriented before—and that too continues. Unable to get good jobs and trusting that credentials are the route to success, a record number of Millennials are working to get degrees. Today, the share of 25- to 29-year-olds with four-year college degrees (at 33 percent) and high-school diplomas (at 90 percent) are both at record highs (Fry and Parker 2012). The on-time high school graduation rate (at 81 percent) is also at a record high (Brounstein and Yettick 2015). And despite the difficult youth economy, the share of teens age 16 to 19 who are neither enrolled in school nor working (7.9 percent) hovers near its all-time low (Child Trends Databank 2015c).

Unlike Boomers, who famously boasted of "sticking it to the man," Millennials express little desire to defy the norms and persist in believing that by following the rules they will achieve the American Dream. And what is that Dream? According to MetLife, it is surprisingly conventional: Millennials agree at least as much as older generations that it means marriage, children, home, college education, and financial security. While many Millennials are delaying

children and (especially) marriage, a vast and undiminished majority regard both as essential life goals. They are not happy with their growing college loan indebtedness, which passed $1 trillion in 2011 (Mitchell and Jackson-Randall 2012). But they feel they cannot afford not to incur it. For a growing share of Millennials, the college mortgage is replacing the home mortgage.

Finally, Millennials were collectively optimistic before the recession—and, remarkably, remain optimistic still. Surveys confirm (Pew Research Center 2014) that, as roughed up by the economy as they are, today's Millennials lead other generations (especially Boomers) in expressing confidence in America's future. In fact, a majority of Millennials think they will be better off than their parents—even if their parents disagree. And in an era when Americans of all ages generally don't trust public leaders, Millennials are most likely to trust the federal government to "do what is right" (Pew Research Center 2013a).

This sunny perspective sets Millennials apart from Boomers back when they were young adults in the '60s and '70s. In a 1974 Gallup survey, only about half of adults under age 30 said they had "quite a lot" of confidence in America's future, compared with about 70 percent of those ages 30 and older (Pew Research Center 2013a). This relative pessimism has stayed with Boomers as they've aged. Over the past two decades, this generation has generally expressed more discontent than other age groups about the state of the nation and their quality of life (Cohn 2008). Perhaps the only adequate parallel for the optimism of today's Millennials is the G.I. generation during the Great Depression, who famously "accentuated the positive"[27] even at the bleakest of times.

This mentality may grow even stronger among late-wave Millennials. In a recent study of teens (Agathoklis 2013), MTV summed up their mentality with the World War II adage, "keep calm and carry on." This group has come of age during the downturn and is adapting an attitude of implacable resolve to prepare for life in the brave new economy.

A Generational Perspective: Some Concluding Remarks

Americans have long taken for granted that their living standards will rise, generation over generation—an expectation that has been borne out through most of the nation's history and has been enshrined as a cornerstone of the American Dream. In recent decades, an increasing share of Americans doubt

27 "The Andrew Sisters & Bing Crosby—Accentuate the Positive" [video file], uploaded May 31, 2015, https://www.youtube.com/watch?v=5Qk9o_ZeR7s.

that upward generational mobility will still be there for their children. And a rising number of policymakers have deliberated over ways to make generational progress again a reality.

The premise of our paper is that a generational challenge requires a generational perspective. We have taken overall standard of living measures, and we have disaggregated them into separate half-generational cohort groups. We then looked at the collective life stories of five generations of Americans. What can we learn from these narratives?

First, the Declining Generational Trend in Median Affluence Is Not a New Development.

Media stories often imply (Smith 2012) that post-2008 Millennials are the first generation of young adults to experience "downward mobility." Most Xers already know that's false. Some have penned eloquent and barely printable responses (Honan 2011) pointing out that not only did Xers get "f---d over," but that—unlike Millennials—"Generation X wasn't surprised. Generation X was kind of expecting it." Which is why so few of them complained, except maybe in an old Winona Ryder movie.[28]

Yet, as we've seen, even Xers get it wrong: The first cohort group to fall behind was not the Breakfast Club (born in the early '60s), but the Madonna- and Michael Jackson-age kids at the tail end of the boom (born in the mid-to-late '50s). As youth, they got buffeted young by the turmoil of the '60s. Coming of age, they got slammed by the Ford-Carter stagflation and ultimately started careers much later than first-wave Boomers. More recently, they've become 50-somethings aiming to retire later in hopes of retiring comfortably—or, abandoning hope, "retiring" early in record numbers on disability insurance (Merline 2012).

Five years from now, this leading edge of generational downward mobility will begin hitting retirement age. More than a decade ago, Craig Karpel (1995) foresaw that many former yuppies were destined to become "dumpies" (downwardly mobile urban middle-aged people). That era dawns. According to Pew, "early Boomers may be the last generation on track to exceed the wealth of the cohorts that came before them and to enjoy a secure retirement" (The Pew Charitable Trusts 2013).

28 "Reality Bites (1994)—Official Trailer" [video file], uploaded on July 29, 2011, **www.youtube.com/watch?v=xDYGo0UgIVM**.

Second, Inequality Is on the Rise—and This Too Started with the Late Boomers.

Late Boomers came of age in the late 1970s, just when the decades-long trend toward greater income equality in America, driven by the G.I. generation, began to reverse decisively. Thus, the same half generation that initiated the trend toward downward generational mobility is also (as we have seen) the half-generation that initiated the clearest break toward greater generational inequality. While this may be a coincidence, we think it probably isn't. One connection between a lower median and a greater inequality is simple mathematics. In income distributions, the median typically falls behind the mean precisely when the dispersion grows.

Yet the connection is surely deeper than that. With Boomers prioritizing individualism and personal risk-taking, and devaluing any standard benchmark for material success, they may have set the stage for both growing income inequality and downward mobility. By shifting the cultural and political discourse away from government and institutional supports, as the G.I.s had established, and towards a credo of personal responsibility, the economy that Boomers created was not designed to "lift all boats" (to quote John F. Kennedy (1963)), but rather to let each person "do your own thing" (to quote a memorable motto of '60s youth).

Third, the Relative Affluence of Today's Elderly Is Historically Unprecedented.

Behold the flip side of the declining life cycle fortunes of younger generations. Never before have Americans age 75+ had a higher median household net worth than that of any younger age bracket. And never before have poverty rates among seniors been so much lower than among the young. In 1985, 12 percent of *Forbes'* richest 400 Americans (Associated Press 1985) were under age 50—and 4 percent were under age 40. Today those figures are 8 percent and 2 percent, respectively (Dolan 2014). In fact, though Xers today outnumber the Silent by over three to one, the Silent collectively possess nearly twice as much wealth.

Understandably, today's elders have become economic backstops for their grown kids and grandkids—subsidizing them, housing them, co-signing their loans, funding extended-family vacations, and setting up college trust funds. The Silent generation came of age in an era (the early 1960s) when the elderly were vastly more impoverished than younger Americans—hence the need to declare a federal "war" on their destitution. Today, many Silent find themselves waging their own campaign against youth poverty within their own families.

Fourth, Generation X Is Currently in the Greatest Danger.

One question sometimes asked is which generation is worst off economically. The answer, we believe, isn't Millennials. Few were old enough to lose much wealth in the recent crash. And though they're encountering a very rough start, they have decades to make up lost earnings and savings. Barring a catastrophic national future, they should be OK.

We're more worried about Gen Xers, who were hit harder and at a more vulnerable stage in their lives—considering that a large share were not doing well to begin with. Many have become detached from the labor force. Most are used to getting by on their own without recourse to safety nets. And the oldest Xers don't have much time left to repair their balance sheets before retirement.

Policies targeted at this generation (Americans today aged roughly 35 to 55) should therefore be a national priority—and should emphasize self-help and labor force reattachment. We need to help millions of Xers save more, find jobs, and even re-engage with our political system. Given that Millennials look to government to solve problems, they may be instrumental in ushering in a new era of policies to collectively improve these conditions.

Fifth, Millennials Will Be Helped not Just by Their Better Timing, but also by a Generational Shift in Their Expectations and Behaviors.

We're already mentioned several generational traits that should play in their favor over the next few decades. Millennials are risk-averse, which is already translating in more careful career and life planning and earlier retirement savings habits; eventually, it is likely to translate into higher savings rates. Millennials are close to their families, which provides them with a more secure safety net, more advice and assistance preparing for their future, and more help raising their own families. Millennials are achievement-oriented, which makes them more patient in waiting for their credentials to pay off. And Millennials are more collectively optimistic about the future, which gives them the hope that they are on the way to building an economy that works better for the typical household.

There is perhaps one other trait worth mentioning that could in time be historically decisive. More than Boomers or Xers (at any age), Millennials are team oriented: They do community service, they live together in groups, they are 24/7 interconnected on social media, they fuel the sharing economy, and they favor group awards. Surveys show that they are much more likely (both Democrats and Republicans) than older generations to say that

government should promote the principle of "community" over "self-reliance" (Congressional Institute and LifeCourse Associates 2015).

This could have political consequences down the road, especially if another economic or financial emergency compels political leaders to rewrite the rules of the game. Such an outcome could re-tip the playing field toward a new and younger middle class. When the New Deal was proposed in the midst of such a crisis, an energized generation of young G.I. voters helped push it through. Perhaps something similar could happen again.

Finally, the American Dream Is Reimagined by Each Generation.

There was a time when young adults defined the Dream as a bigger home and a bigger pension for everybody. Millennials think and talk about homes and pensions—and, as we've seen, they still think they're an essential part of the American Dream. But they no longer assume that Dream is for everybody. In recent decades, Boomers and Xers have gradually redefined the Dream as more qualitative than quantitative, more private than public (MetLife 2011). As such, it remains universally accessible only by becoming intangible. Peak experiences are for everyone, but a good pension is for the few.

As goes the Dream, so goes the direction of our nation. We've become an economy less focused on building things for our collective future and less interested in the material prosperity of younger generations. Remarkably, despite the unprecedented relative wealth of today's seniors, Congress continues to spend massively on them: Over one-third of the federal budget consists of benefit payments to 65+ Americans (Grady and Klunk 2007). That's well over $1 trillion, or about $25,000 per person—mostly without regard to financial need. Meanwhile, future-related spending is getting all but squeezed out of public budgets, causing infrastructure to rust (Dennison 2013) and an alarming share of today's college students to drop out (Wells 2013) or rush to food banks (Bahrampour 2014) out of dire need.

As a brute economic proposition, the prospects for America's younger generations are unlikely to improve until our nation invests as much in the young for what they will do tomorrow as it rewards the old for what they did yesterday. A half-century ago, we were such a nation. Might we become one again? In time, the American Dream will likely shift back again. We already see some signs of this happening among Millennials—in their higher savings rates, closer connection to family life, and desire for community. As voters and leaders, this rising generation will sooner or later galvanize a change in that direction.

Data and Methods

The data used in this paper come from two main sources—the Current Population Survey (CPS) and the Survey of Consumer Finances (SCF).

CPS Analyses

To explore income differences between generations and half-generations in this paper, CPS data were used. The CPS is continuously collected by the U.S. Census Bureau and is considered the leading national source of income data. Two versions of CPS data were used in this paper—the Integrated Public Use Microdata Series (IPUMS) (King et al. 2010) and the public historical tables published by the U.S. Census Bureau.

The IPUMS data used in this study are from the 1964 to 2014 CPS, typically from the Annual Social and Economic Supplement. In this analysis, all income data were inflation adjusted to 2013 dollars using the CPI-U-RS.

In the IPUMS-CPS analyses, the variable FTOTVAL was used for all years from 1964 to 2014, which represents a family's total income, thus excluding the income of unrelated household members. Analyses were conducted and weighted at the person-level and were restricted to the householder. All median income estimates and Gini coefficients were produced for each half-generation for each year in which householders were aged 18 to 80. Estimates were then linked to the average age of each half-generation in each year to illustrate the life cycle trajectory of income for each group by age. Smoothing was applied to income figures for those years where data did not align with a particular cohort's average age.

Other analyses in this paper used CPS income data from published historical census tables, including the years 1950 to 2010. Specifically, historical table F-11 ("Age of Householder—Families, All Races by Median and Mean Income: 1947 to 2013") was used to pull all estimates of family income by age and can be located here: **www.census.gov/hhes/www/income/data/historical/families/**. Median income data points were used from this table for 10-year age brackets at 10-year intervals. All estimates were inflation adjusted to 2013 dollars.

SCF Analyses

In order to understand wealth differences between the generations and half-generations, the SCF was used. The SCF is considered the leading source of data on wealth in the United States and has been collected triennially by the Federal Reserve Board from 1983 to 2013.

Both published data from the SCF bulletins and the downloadable data files were used in this paper (Board of Governors 2013). Published data from 1983 to 2013 were used to construct the net worth trajectories of each age cohort over time according to when most members were included in major age brackets in each survey year. The downloadable data files from 1989 to 2013 were used to merge the precise age of householders from the full data files with net worth values from the abstract data on the Federal Reserve website. This allowed aggregation of the net worth of all householders in each year of each SCF survey. Then, in order to understand compositional differences in wealth by age, large categories of assets and debt were collapsed and were analyzed according to 10-year groupings for each data year. All estimates in the downloaded data were weighted using the five implicates provided with the SCF. All data, whether downloaded from the SCF or taken from published bulletins, were inflation adjusted to 2013 dollars. ■

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A Country Divided: The Growing Opportunity Gap in America

REUBEN FINIGHAN
University of Melbourne

ROBERT PUTNAM
Harvard University

A bedrock American principle is the idea that all individuals should have the opportunity to succeed on the basis of their own effort, skill, and ingenuity.

—Ben Bernanke, former Chair of the U.S. Federal Reserve Board, 2007

Are the destinies of children from poor and wealthy families diverging? This paper explains why this is the question to ask if we wish to study equality of opportunity in America today. Drawing on the research behind Robert Putnam's (2015) *Our Kids: The American Dream in Crisis*, we show that, since the 1970s, children in the top-third and the bottom-third of the socioeconomic hierarchy have sharply diverged on factors predicting life success. This gaping "opportunity gap" augurs a collapse of social mobility in the decades ahead. Given the causes of the opportunity gap, we explore promising policy options for restoring equality of opportunity in America.

The U.S. Federal Reserve was an innovation of a period that makes an ideal starting point for this discussion: the Progressive Era. The reforms of the Progressive Era were a response to the soaring income inequality and financial instability of the Gilded Age in the late 19th century. Widespread unease with these conditions sparked decades of national debate and efforts by reformers that would reshape the nation. Central banking was a key innovation, directed at softening the blows of financial crises, but this paper takes greater inspiration from the many fundamental institutional changes that helped equalize incomes and opportunity. These changes began in the Progressive Era and were completed in the years following Franklin D. Roosevelt's New Deal, laying the foundations for the Golden Age of the 1950s and 1960s—a period of high growth, during which income inequality reached its lowest ebb.

History is now repeating. Since the 1970s, income inequality has again soared to levels not seen since early in the 20th century. While the economy more than doubled over these four decades, the rising tide did not lift all boats.[1] As a result, the past century traces a U-shaped curve from one Gilded Age to another, with an intervening period of relative equality. This is, in the words of economic historians Claudia Goldin and Lawrence Katz, "a tale of

1 See Organization for Economic Co-operative Development (2015) United States real GDP data, available at **http://stats.oecd.org/**.

two half centuries" (Goldin and Katz 2001). The second of these half-centuries also changed how Americans are spatially distributed. From a society defined by economic integration in 1970, with around 65 percent of people living in middle-income neighborhoods, America has reached unprecedented levels of economic segregation, with around 60 percent of people now living in majority rich or poor neighborhoods (Bischoff and Reardon 2014).[2] Income inequality has heightened, but paradoxically it has become less and less visible in citizens' neighborhoods and everyday lives.

This provokes a question of exceptional importance: Does the return to a Gilded Age matter? Income inequality is conceptually distinct from equality of opportunity, and for most Americans it is also morally distinct (Page and Jacobs 2009).[3] Indeed, following his remarks on equality of opportunity, as cited at the opening of this paper, Bernanke argued that "we do not guarantee equality of economic outcomes, and nor should we" (Bernanke 2007). Americans tend to care less about inequality of income than other Western nations, but across all ideological lines they are committed to equality of opportunity. The distribution of income matters less than the ideal that every child, regardless of his or her social background, has a similar opportunity to earn a place higher on that distribution.

Yet there is a creeping sense that equality of opportunity has been eroded over this same period. Polls show that the number of Americans who believe equality of opportunity characterizes American society has, after many decades of stability, begun to slide (Page and Jacobs 2009).[4] President Barack Obama, as well as presidential candidates like Jeb Bush and Hillary Clinton, have all emphasized equality of opportunity as a crucial issue in today's economy

2 See also Fry and Taylor (2012); and Jargowsky (2013).

3 Scholars disagree about the degree to which Americans favor equality of outcomes, but all agree that equality of opportunity is a virtually universally shared value. See Hochschild (1981); Bartels (2008); Newman and Jacobs (2010); and McCall (2013). See Kohut and Dimock (2013) for evidence that "Americans' core values and beliefs about economic opportunity, and the nation's economic outlook, remain largely optimistic and unchanged."

4 Page and Jacobs (p. 51) report that in 2007 three-quarters of us believe that "it's still possible to start out poor in this country, work hard, and become rich." On the other hand, Gallup (as cited in McCall 2013: 182) reported that the fraction of Americans "satisfied with the opportunity for a person in this nation to get ahead by working hard" fell from 76 percent in 2001 to 53 percent in 2012. Moreover, a poll in 2014 found that "only roughly 4-in-10 (42 percent) Americans say that the American Dream—that if you work hard, you'll get ahead—still holds true today, [whereas] nearly half of Americans (48 percent) believe that the American Dream once held true but does not anymore," while "most Americans (55 percent) believe that one of the biggest problems in the country is that not everyone is given an equal chance to succeed in life" in Jones, Cox, and Navarro-Rivera (2014).

(Obama 2013; Sarlin 2015; and Badger 2015). Many social scientists, politicians, and citizens—although by no means all—suspect that high inequality may tighten the connection between children's and parents' incomes. But this connection is, ultimately, an empirical question. It is one that this paper addresses in the first two sections.

The first section turns to the problem of measuring social mobility—and why the right question is "what is happening in the lives of America's kids?" It explains why standard social mobility measures are necessarily *lagging indicators*, and that they cannot yet detect the effects on mobility of the immense socioeconomic changes that occurred over the last few decades. On the other hand, there is powerful evidence that formative experiences in childhood are the most important determinants of opportunity. The rationale of *Our Kids*, then, is to avoid the lagging indicator problem by directly tracking the evolving differences between children's lives on either side of the socioeconomic divide.

In defining this divide, we follow sociologists like Douglas Massey in using educational attainment as the core indicator of a family's social class (Massey 2007). Education is not only strongly linked to income, but also tends to be the more powerful predictor of child-related outcomes. Roughly the lower third of Americans by class has a high school education or less ("poor" families in this paper), the middle third has some post-secondary education, while roughly the upper third has a BA or more ("rich" families).

The second section examines the evidence on how opportunity indicators differ across the lives of wealthier and poorer children. Central to this are a series of "scissor" graphs, showing that class-based gaps between children have tended to increase since the 1970s, following a characteristic pattern like a scissors' diverging blades. This scissor pattern is found across many domains of children's lives, and we focus on family structure, parenting style, schools, and community connectedness. While children in wealthy families have access to more opportunities than ever before, children in poor families face ever-mounting barriers.

The final section asks how we can reverse the incipient decline of social mobility in America. It draws on the lessons of the early 20th century, as the previous Gilded Age was eventually transmuted into a Golden Age of widespread prosperity in mid-century America. This decades-long project required innovations—including the public high school—at all scales of community and governance, and much learning from successes and failures alike. What will be the modern equivalent of the Progressive Era's high school? Following *Our Kids*, the paper surveys evidence on the most promising policy interventions in such areas as working-class incomes, universal early childhood education, school and community desegregation, and on-ramps for employment outside of the college track.

Measuring Social Mobility

Standard measures of social mobility assess the correlation between parents' position on the socioeconomic hierarchy and that of their children, both measured at the same stage of the life cycle. For this reason, time series data cannot yet speak persuasively about the effects on social mobility of the soaring inequality of the past few decades. Children only display their full earnings potential when they have finished their education and established their careers, in their 30s and 40s. Americans in their mid-30s today were born around 1980, before income gaps had substantially opened. Those in their mid-20s were born at a time where gaps had expanded somewhat, but we cannot use their earnings yet—many of them, especially future top-earners, are still scrounging students with minimal income. Inevitably there are lags measured in decades between socioeconomic change that affects kids and the visible effects on those kids as adults. Conventional indicators of social mobility therefore provide only a "rearview mirror" take on the problem, some 30 to 40 years out of date.

To avoid the rearview mirror problem *Our Kids* draws upon a different kind of time series data, concerning the changing nature of childhood in America. A vast body of economic, psychological and neuroscientific research indicates that formative experiences between birth and the end of the teens—and especially in early childhood—are the most powerful determinants of an individual's later success. For example, the experience of poverty leaves permanent marks on the developing brain, impairing basic psychological functions like executive function and working memory; access to extracurricular programs in teenage years is associated with the development of soft skills that are at least as important as hard academic skills in educational and career success; and so on. These "opportunity indicators" strongly predict educational success and income. Thus, what "equality of opportunity" means in practice is that each child has reasonably similar access to healthy emotional and cognitive development.

Opportunity indicators are therefore a valuable proxy for equality of opportunity. For predicting how today's children and young adults will fare in the future—to look out the front windshield and see where America is heading—they are the best and only tools available. If a single opportunity indicator showed a large and increasing class divide, this might give us pause. What we see in the following section, however, are growing divides across a host of factors that are known to be crucial for children's life chances. The evidence suggests that a crisis of social mobility is set to unfold over the coming decades.

The Evidence: A Growing Divide

Our Kids was woven from two different threads of research, one quantitative and the other qualitative. The quantitative contribution comprises novel analyses of longitudinal datasets as well as reviews of existing research. This was complemented and informed by hundreds of hours of qualitative interviews with scores of rich kids and poor kids across the country, yielding insights into how different forms of advantage and disadvantage accrue and interact.

This paper focuses on the quantitative analysis. It summarizes some of the most salient findings of *Our Kids,* focusing on class divides in family structure, parenting styles, schools and education, and community, that shape children's futures. Readers interested in the full detail of the argument and the richness of the personal stories should turn to the book and its sources.

Family Structure

As the economic fault line has widened into a chasm, the families on either side have begun to look increasingly different. These family differences in turn provide very different starting conditions for children, potently shaping their prospects for success and well-being in adulthood. Fifty years ago, such differences were not so striking. Most American families consisted of a breadwinner dad, a homemaker mom, and the kids: a stable, Ozzie-and-Harriet-style union. Divorce was uncommon, and births outside of marriage were rare in all social strata—4 percent overall in 1950, although the rate was slightly higher among the economically disadvantaged (Cherlin 2010).

In the 1970s, this family structure bifurcated into two distinct patterns closely correlated with class. In the college-educated, upper third of American society, a "neo-traditional" marriage pattern emerged, mirroring the 1950s family structure except that now both parents typically work outside the home and delay childbearing until their careers are under way. In the high-school-educated lower third of the population, by contrast, a more kaleidoscopic pattern began to emerge: childbearing became increasingly disconnected from marriage, sexual partnerships became less durable, and single-parent families became the norm.[5]

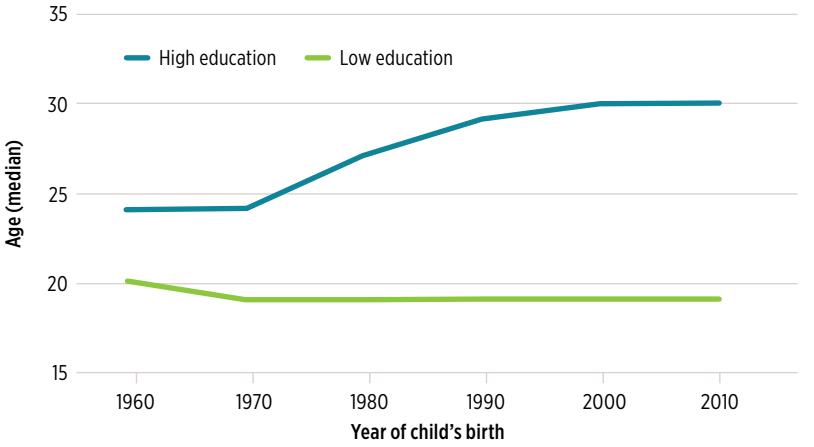
5 Landmark scholarly recognition was McLanahan (2004). On single-parent families: In the first half of the 20th century most single-parent families were such because of the death of a parent, but that fraction sharply declined from the 1930s to the 1970s. Leaving orphans aside, the fraction of 16-year-olds living with two biological parents declined from 85 percent in the 1960s to 59 percent in the 1990s. Ellwood and Jencks (2004).

Mother's age at birth: College-educated mothers now typically delay childbearing and marriage until their late 20s or early 30s, about six years later, on average, than their counterparts a half century ago. High-school-educated mothers have followed a very different trajectory, as shown in figure 1. They typically have their first children in their late teens or early 20s, slightly earlier than their counterparts in the 1960s, and 10 years earlier than college-educated moms today. Delayed parenting helps kids, because older parents are generally better equipped to support their kids, both materially and emotionally.

Nonmarital births: Nonmarital births to college-educated women remain around 10 percent, and, as shown in figure 2, this represents only a slight rise since the 1970s. Among high-school educated women, however, nonmarital births have risen sharply over the last 30 years and now make up nearly two thirds of all births (about 65 percent in 2007). This is mostly due to a quadrupling in the rate for high-school-educated white people, to about 50 percent. The proportion of nonmarital births for black college graduates has actually fallen by a third over the past 20 years, to 25 percent. In other words, the racial gap has narrowed, while class gaps have widened.

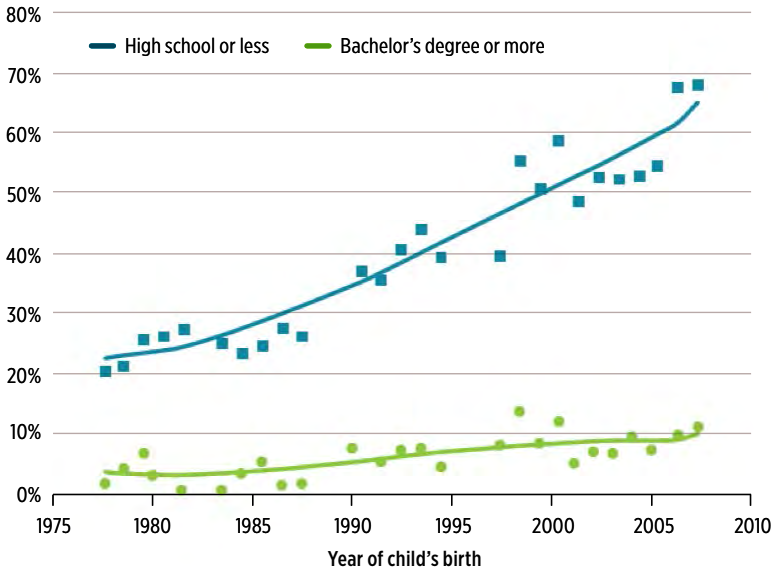
Single-parent families: Around 6 percent of children lived in single-parent homes in 1960, but today over half of all children will spend some time in a single-parent family before reaching 18. Most of these children are in poorer households. Figure 3 focuses on children aged 0–7, and shows that while

Figure 1. Trends in median age of mothers at first birth, 1960–2010



Source: McLanahan and Jacobsen (2015).

Figure 2. Births to unmarried mothers by education, 1977–2007



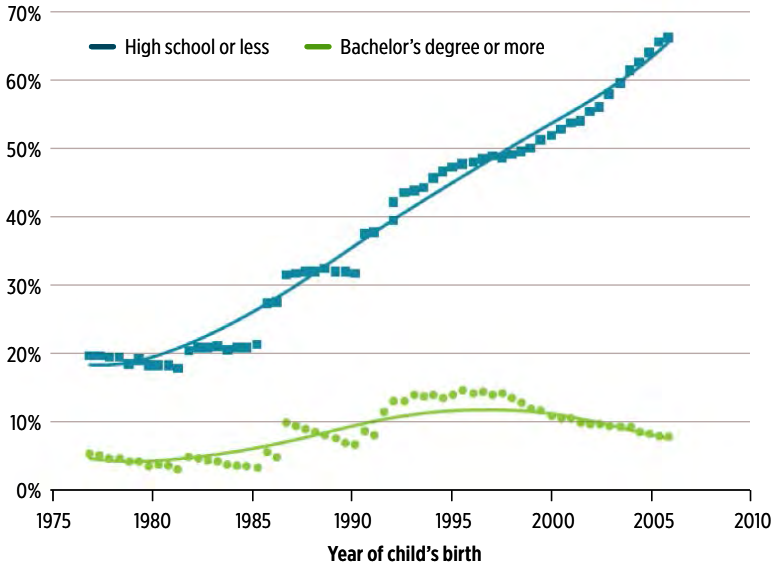
Source: National Surveys of Family Growth, Centers for Disease Control.

the stable nuclear family is as strong as ever for families where parents have a college education, roughly two-thirds of poor children live in single-parent families—up from just 20 percent in the 1960s.

Women's employment: After 1960, employment rates rose for all women, but the increase was faster and more substantial among college-educated women, so that college-educated mothers (70 percent working) are now more than twice as likely as high-school-educated moms (32 percent working) to work outside the home (McLanahan 2004). College-educated moms are also more likely to have a male breadwinner in the household, resulting in a substantial class disparity in the financial resources available for childrearing.

The outcome of these changes is a two-tier structure of American families: an upper, college-educated third with two parents, both likely to be earning; and a lower, high-school-educated third most often with one parent, or in "blended" families that include step-parents and half-siblings, rarely with more than one wage earner. Poor kids often find themselves caretakers for siblings and half-siblings, substituting for absent parents.

Figure 3. Children (aged 0–7) living in a single-parent family, by parental education



Note: Includes both single mothers and single fathers. About 4 percent of children—most of them from lower-income backgrounds—are being raised primarily by their grandparents.
Source: IPUMS (census 1970, 1980, 1990, 2000) and ACS 2001–12. Also McLanahan and Percheski 2008.

There are competing structural and cultural explanations for these changes, with evidence pointing in both directions. As *Our Kids* explains, poor women value marriage as much as affluent women. They also equally believe that marriage should be delayed until the couple has achieved economic well-being.[6] The problem is that the wages of men without college degrees have stagnated or fallen since the early 1970s, and both unemployment and financial strains discourage and undermine stable relationships. Similar patterns were seen in past episodes of economic malaise like the Great Depression (Cavan and Ranck 1938). On the other hand, while marriage rates fell sharply during the 1930s, the non-marital birth rate remained essentially constant despite relatively primitive forms of birth control. This suggests that changed values have played a significant role in the rise of non-marital births during the hard times of more recent decades (Bachu 1999). Changing personal values are part of the story, but they are probably secondary to economic trends.

6 Edin and Kefalas (2005) as summarized in Smock and Greenland (2010), 582–83.

Parenting

Neurobiological research emphasizes that early childhood developmental experiences are crucial for the brain development that underpins later success in life.[7] Healthy infant brain development requires connecting with caring, consistent adults, in give-and-take learning—"contingent reciprocity," or "serve-and-return" interaction (National Scientific Council on the Developing Child 2004). Different patterns of parenting and caregiving can therefore help, or hurt, a child's cognitive and socioemotional development. Supportive caregiving, especially before the age of five, is key for the development of the brain's basic executive functions—concentration, impulse control, mental flexibility, and working memory.

The corollary of this is that early damage is harder and more costly to remediate later in the child's development. It is associated with poorer adult health, educational, economic, and well-being outcomes (Center on the Developing Child 2012). Adverse events that cause such damage are much more likely for poorer children, and even children who are not so poor—children living at twice the poverty level are two to five times more likely than their less impoverished peers to experience parental death or imprisonment, physical abuse, neighborhood violence, and drugs or alcoholism in the family.[8]

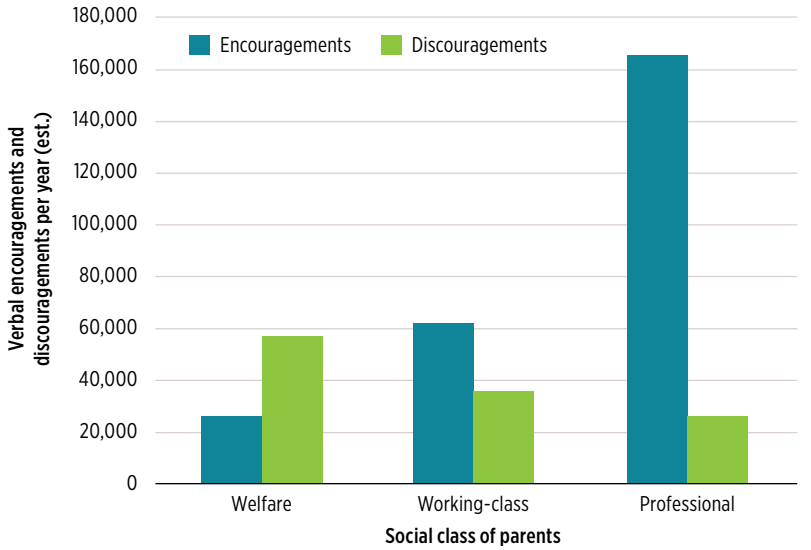
Obedience vs. autonomy: Poorer children are also more likely to experience punitive home lives. Well-educated parents aim to raise independent and self-directed children, whereas less educated parents, living in more dangerous neighborhoods, focus on discipline and obedience.[9] Different emphases on discipline versus high self-esteem autonomy show up in verbal interactions. A careful study of the daily verbal exchanges between parents and children found, as illustrated in figure 4, that parents with professional degrees annually delivered about 166,000 encouragements and 26,000 discouragements, working-class parents delivered 62,000 and 36,000, respectively, while parents on welfare delivered 26,000 and 57,000, respectively (Hart and Risley 1995).

7 Found in Committee on Integrating the Science of Early Childhood Development (2000). We draw heavily on the excellent selection of working papers and issue briefs compiled at the Center on Developing Child at Harvard University, **http://developingchild.harvard.edu/**. Other key citations include Tough (2012); Evans and Schamberg (2009), 6545–49; Heckman (2006), 1900–02; Heckman (2012); Knudsen, Heckman, Cameron, and Shonkoff (2006), 10155–62; and Shonkoff, et al. (2012), e232–46.

8 Poor kids (<200 percent FPL): 4 percent parent death; 11 percent parent imprisoned; 10 percent saw parental physical abuse; 12 percent saw neighborhood violence; 10 percent mentally ill family member; 13 percent alcohol/drug problem family member. Not-poor kids (>400 percent FPL): 2 percent; 2 percent; 3 percent; 4 percent; 6 percent; 6 percent. Data from **Childhealthdata.org** 2012.

9 Data from the Faith Matters national survey, 2006. **www.thearda.com/Archive/Files/Descriptions/FTHMATT.asp**.

Figure 4. Class differences in verbal parenting



Source: Hart and Risley (1995).

A large body of research links parental stress with these harsher and less attentive forms of parenting, and worse outcomes for children (Deater-Deckard 2004; Hoff, Laursen, and Tardif 2002, 239; Simons et al. 1994; Conger and Donnellan 2007). Economic stress in particular disrupts family relations, fosters withdrawn and inconsistent parenting, and directly increases chronic stress among children. In *Scarcity* (2013), behavioral economists Sendhil Mullainathan and Eldar Shafir explain that under conditions where time and money are scarce, the brain's ability to grasp, manage, and solve problems falters, and IQ can fall almost a full standard deviation—or as much as missing a whole night's sleep. "Good parenting," they write, "requires bandwidth. It requires complex decisions and sacrifice… This is hard for anyone, whatever his resources. It is doubly hard when your bandwidth is reduced" (Mullainathan and Shafir 2013, 156). The poor are using all their "bandwidth" (working memory) worrying about how to pay the rent, or whether the car will operate today, and this prevents them from using this bandwidth for other pressing problems that they need to solve. While around 20 percent of college-educated families experience financial worries, this figure is close to 50 percent for high-school-educated families.[10]

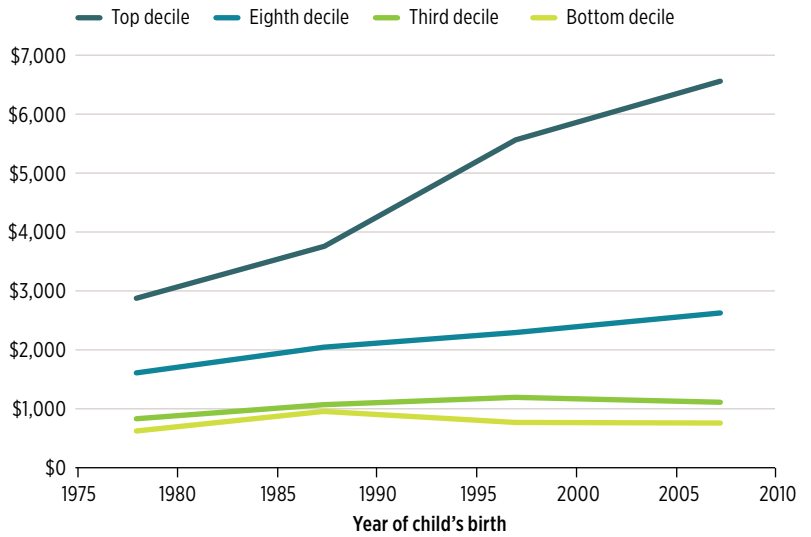
10 See DDB Needham Life Style surveys, **http://bowlingalone.com/?page_id=7**.

Poorer and wealthier parents' contrasting emphasis on obedience versus independence may also be understood as an adaptation to their respective social circumstances: Well-off parents focus on "promotive" strategies, nurturing their children's talents in comfortable settings with many opportunities and few dangers; while poorer families employ "preventive" strategies, aimed at keeping their children safe in rough neighborhoods where dangers far outnumber opportunities (Furstenberg et al. 1999).

Investment of money: Class differences in financial resources are also reflected in different levels of "enrichment spending." While parents' annual spending in this category for the top 10 percent of children has doubled from 1973 to 2005, to almost $7,000 (inflation-adjusted) per year, the bottom 10 percent of children still receive only $750. The increase for wealthy children, shown in figure 5, is concentrated in private education and childcare, but also reflects music lessons, summer camp, travel, school supplies, computers, extracurricular activities, recreation, and leisure. These differences in parental investment are strong predictors of children's cognitive development.

Investment of time: Parents at all educational and income levels are spending more time with their kids nowadays than their counterparts did a half-century

Figure 5. Trends in spending on children per child, by household income, in constant (2008) dollars, 1972–2007



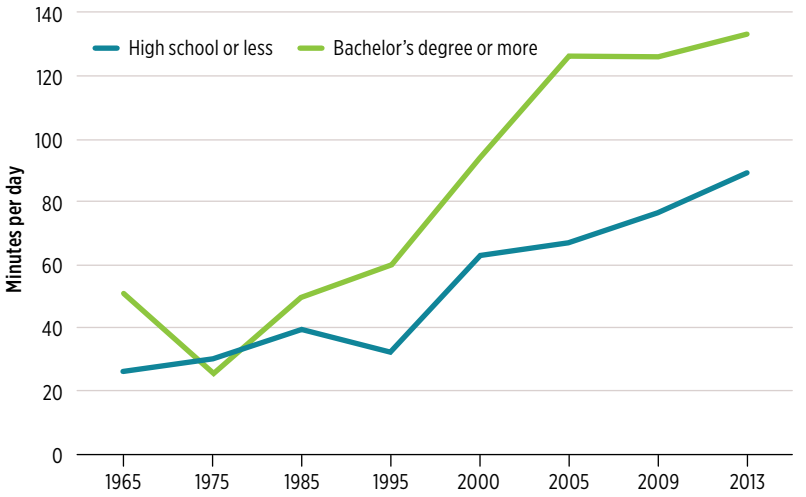
Source: Kornrich and Furstenberg (2013).

ago. However, the increase is much greater among college-educated parents than among high-school-educated parents, and the class gap is concentrated in "*Goodnight Moon* time"—time spent on developmental activities like reading or patty cake. These differences are especially concentrated in the most important period of early childhood. As figure 6 shows, in the 1970s there were virtually no class differences in developmental time, but by 2013 the average infant or toddler of college-educated parents was getting nearly 50 percent more *Goodnight Moon* time every day than the average infant of high-school-educated parents.

By entry to kindergarten, kids from well-educated homes hear 19 million more words than kids from working-class homes, and 32 million more than kids of parents on welfare. Seventy-two percent of middle-class children know the alphabet when starting school, compared with 19 percent of poor children (Hart and Risley 1995; Fernald, Marchman, and Weisleder 2013).

Pre-kindergarten instruction: Quality pre-K instruction could help close such gaps, but at present it only exacerbates them. According to the National Institute

Figure 6. Time spent by both parents in developmental child care, children aged 0–4, 1965–2013



Note: Unlike prior work on this topic, the data in figure 6 have been adjusted to account for the very low time investment in child care by nonresidential fathers; since a large and growing fraction of kids in lower-education households are being raised by single mothers, this adjustment has a substantial effect on the size and growth of the class gap.
Source: Altintas (2016).

for Early Education Research, "At age four, enrollment in pre-K (public and private) is about 65 percent for the lowest 40 percent of families by income and 90 percent for the highest income quintile. At age three when state pre-K is rarely provided, enrollment is only about 40 percent for low-income and moderate-income families while it is 80 percent for the top-income quintile" (Barnett 2011).[11] This is precisely the stage that brain science suggests is so critical.

Schools and Colleges

Poor children bring substantial disadvantage to their first day of school. Does the average school help level the playing field, or does it too only enlarge the gap between poorer and wealthier children?

The public school system was partly created to equalize access to education across the classes, and yet, in outcomes at least, America's education system is becoming more unequal: The gap in elementary and secondary school performance (as measured by test scores) between children from poor and rich families has grown by 30–40 percent over the past 25 years. Yet schools themselves do not seem to be driving this gap—the gap is already large by the time children enter kindergarten, and does not grow substantially as children progress through school (Reardon 2011).

School economic polarization: Why do schools fail to contribute to closing the opportunity gap? Because of the increasing class segregation of American communities, rich kids and poor kids are increasingly concentrated in different and unequal schools**.** However, the evidence suggests that the primary explanation is not to be found in typical measures of school inputs, like spending per pupil, student-teacher ratios, and teacher training and seniority. Instead, the effect schools have on students has more to do with the challenges and assets that children bring with them to school. Affluent kids bring highly engaged parents, one of the strongest contributors to school success, as well as high expectations for themselves and their classmates (Henderson and Berla 1994).[12] Poor kids are much more likely to bring the stress of crumbling families, deprivation, and dangerous neighborhoods. Carrel and Hoekstra (2010) found that kids exposed to domestic violence reduced *other* kids' achievement, especially in high-poverty schools.

Part of the reason that schools are ineffective at leveling the playing field, then, is that 30 to 40 years of increasing social segregation has shunted

11 See also Meyers et al. (2004).

12 Other recent overviews of the vast literature on the effects of parental engagement include: Jeynes (2007); Hill and Tyson (2009); Jeynes (2004); Van Voorhis et al. (2013); and Dufur, Parcel, and McKune (2013). For a recent polemic debate about whether parental involvement is overrated, see Robinson and Harris (2014); and Miksic (2014).

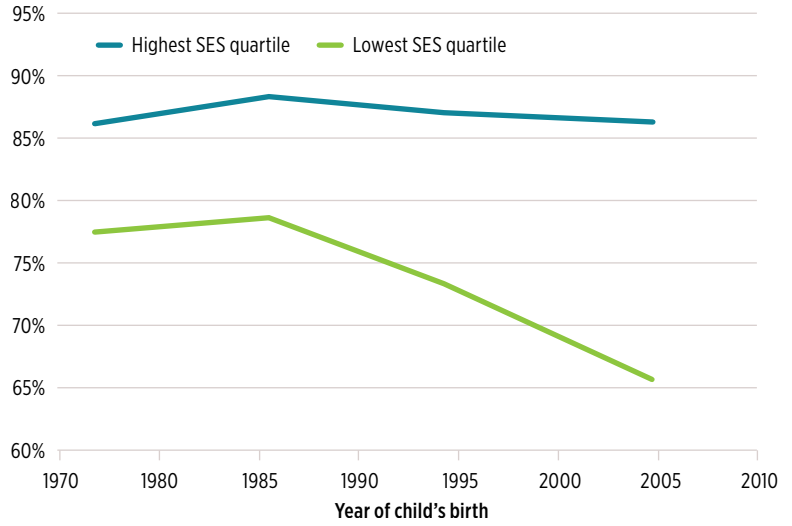
high-income and low-income students into separate schools. "One of the most consistent findings in research on education" is that poor kids achieve more in high-income schools. In fact, some studies find that the correlation of a student's high school learning with her *classmates'* family backgrounds is greater than the correlation with her *own* family background.[13]

Extracurricular activities: Another difference between schools on either side of the class divide is their provision of extracurricular activities. Extracurriculars are especially important for developing noncognitive skills and habits, such as grit, teamwork, leadership, and sociability. Soft skills and extracurricular participation can be as important as hard skills and formal schooling in explaining educational attainment and earnings 10 years later (Lieras 2008; Cunha, Heckman, and Schennach 2010; Covay and Carbonaro 2010). Poor kids are three times as likely to participate in *neither* sports *nor* clubs (30 percent vs. 10 percent), and half as likely to participate in *both* sports *and* clubs (22 percent vs. 44 percent) (Theokas and Bloch 2006). As captured in figure 7, between 1972 and 2004, the participation gap in all extracurriculars between poor and rich kids grew from less than 10 percent to more than 20 percent, and the same growing gap appears for most extracurricular activities viewed separately—from football to choral singing. This is partly caused by the increase of pay-to-play policies, which disproportionately affect poor kids and effectively privatize extracurricular participation, excluding precisely the students who most need these experiences (C.S. Mott's Children's Hospital 2012; Huntington Bank Annual Backpack Index 2014).

Trends in college completion: For a range of socioeconomic outcomes college graduation is much more important than college entrance. While the class gap in college completion was substantial 30 to 40 years ago, it has steadily expanded to a gulf. By the beginning of the 21st century only about 10 percent of children in the lowest income quartile completed college, compared with more than 50 percent of children in the highest quartile (Mortenson 2012).

13 Useful entryways to the massive literature on this topic include Coleman et al. (1966), 325; Orfield and Eaton (1996); Fischer et al. (1996); Kahlenberg (2003), esp. 153–55; Rumberger and Palardy (2005); Logan, Minca, and Adar (2012); and for a comprehensive recent overview, Palardy (2013). Van Ewijk and Sleegers (2010), found that the effect of the socioeconomic composition of a child's classroom on his or her test scores is twice as large as the effect of the socioeconomic composition of his or her school. This entire line of research was stimulated in the 1960s by concerns about the effects of racial segregation, and in that era class segregation heavily overlapped with racial segregation. During the past half-century, however, class segregation has grown, while racial segregation has diminished, and it is now possible to compare the adverse effects of racial and class segregation. While racial segregation continues to be a major national problem, virtually all relevant studies have concluded that class segregation is at least as pernicious in its effects on student achievement. See Kahlenberg (2007).

Figure 7. Growing class gap in participation in school-based extracurriculars, 1972–2004



Source: National Longitudinal Study of 1972; High School and Beyond 1980; National Education Longitudinal Study of 1988; and Education Longitudinal Study of 2002.

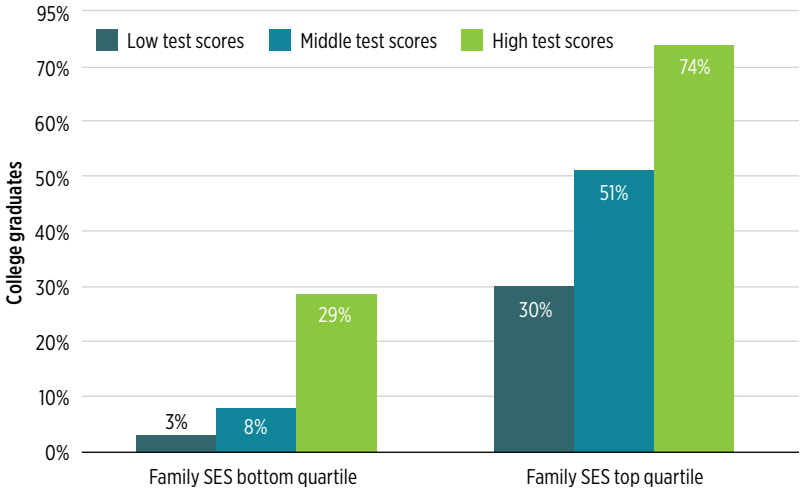
In fact, a family's socioeconomic status has become more important than test scores in predicting which eighth graders would graduate from college. The data behind figure 8 reveal exactly the opposite of a meritocracy—that children are slightly more likely to end up with a college degree if they are poor students (bottom-third of test results) but come from an affluent family, than if they are smart and hard-working (top-third in test results) but come from an impoverished family.

Rising tuition costs and student debt are the final straw, not the main load. The gap appears to be created more by what happens to children before they get to school, what happens to them outside of school, and by what they bring (or do not bring) with them to school. Schools as *sites* therefore are where the class gap widens, even if schools as *organizations* are mostly blameless.

Community

Social capital is used to describe social connectedness—ties to family, friends, neighbors, and acquaintances; involvement in civic associations, religious institutions, athletic teams; and so on. These community bonds

Figure 8. Family background matters more than eighth grade test scores for college graduation

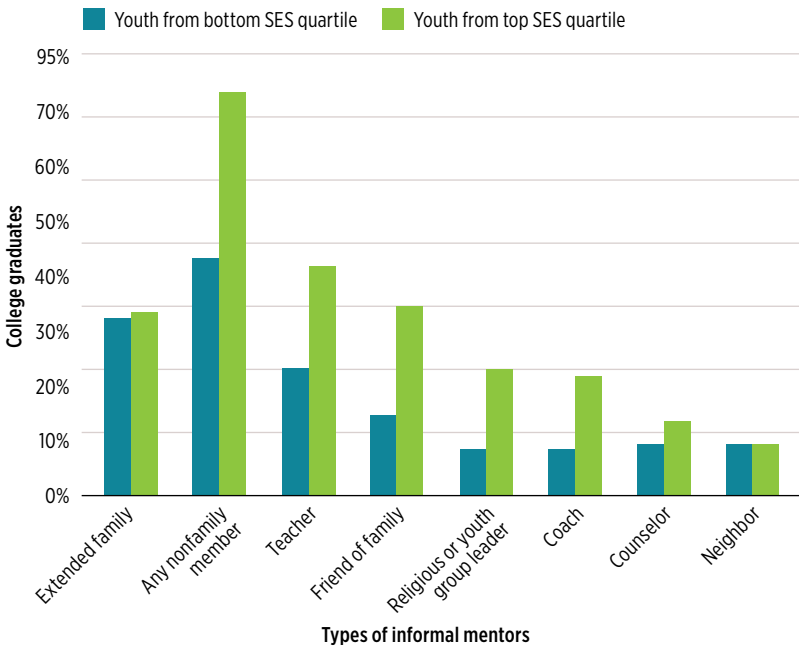


Note: Test scores refer to eighth-grade mathematics achievement scores. Family socioeconomic status (SES) is measured by a composite score on parental education and occupation and family income. "High" refers to test scores or SES in the top quartile, "low" to test scores or SES in the bottom quartile, and "middle" to test scores or SES in the middle two quartiles. College graduation means obtained BA within 12 years after completing the sophomore year.
Source: Fox, Connolly, and Snyder (2005), 50. Based on data from the National Education Longitudinal Study of 1988 (NELS:88/2000), Fourth Follow-up.

and social networks have powerful effects on health, happiness, educational success, economic success, public safety, and especially child welfare.[14] The growing economic segregation we described earlier magnifies inequality by concentrating poor families in places that have fewer safe places to play, fewer job opportunities, fewer trusting neighbors, and fewer institutional resources. In the area of social capital, *Our Kids'* principal finding is that better-educated Americans have wide and deep social networks, while less-educated Americans have sparser social networks, concentrated within their own family (Marsden 1987; Fischer 1982; Campbell, Marsden, and Hurlbert 1986; Broese Van Groenou and Tilburg 2003; and Petev 2013). The difference between the dense social support available for rich kids and the growing social isolation of poor kids is one of the most portentous aspects of the growing opportunity gap.

14 For an introductory overview of this massive literature, see Putnam (2001), 287–363.

Figure 9. Affluent kids have a wider range of informal mentors



Note: Civic Enterprises in association with Hart Research Associates, "The Mentoring Effect: Young People's Perspectives on the Outcomes and Availability of Mentoring," report for MENTOR: The National Mentoring Partnership (January 2014), accessed August 21, 2014, **http://www.mentoring.org/images/uploads/Report_TheMentoringEffect.pdf**. This report offers extensive evidence of the value of both formal and informal mentoring for at-risk kids. We are grateful to John Bridgeland of Civic Enterprises and to Hart Research Associates for making the survey data (a nationally representative sample of 1,109 youth aged 18–21) available to us for secondary analysis, for which we alone are responsible.

Mentoring: When adjusting to college, choosing college majors, and making career plans, kids from more educated homes engage a wider array of informal advisors—family, faculty and outsiders (figure 9). The informal mentoring gap is substantial in elementary school and steadily increases as children age through middle school and into high school. Nearly two-thirds of rich kids have mentors outside their extended family, while nearly two-thirds of poor kids do not. Poor kids are almost twice as likely to report that they want a mentor but do not have one—as in the case of extracurricular opportunities, support that used to be collectively provided has become increasingly

privatized, and thus less available to poor kids.[15]

Poor kids' isolation reduces their access to information that would help them navigate important decisions, and also reduces their access to other kinds of resources that networks provide. One example is the notion of family and community "air bags" that deploy when adolescents encounter risks or make missteps.[16] Studies over the last 40 years tend to find that, if anything, drug use and binge drinking are *more* common among privileged teens than their less affluent peers.[17] Youth development is not about avoiding all mistakes, but learning from those you do make. All kids—rich, poor, black, white, brown—do dumb things. Poor families, however, lack the resources and connections to minimize the negative consequences of such misadventures.

Policy Implications

The evidence above paints a gloomy picture for the future of social mobility in America. Notably, these findings are well-aligned with other studies in the literature—Chetty et al. (2014a), for example, identify a strikingly similar pattern of factors as most important for determining which U.S. regions are more socioeconomically mobile: "High mobility areas have (1) less residential segregation, (2) less income inequality, (3) better primary schools, (4) greater social capital, and (5) greater family stability" (Chetty et al. 2014a).[18]

Children born today are likely to be the most socioeconomically divided generation in many decades. Given the lagging nature of social mobility measures, this generation will not show up in standard measures for several decades. Policy responses to social mobility thus suffer from a time-lag problem very similar to that of carbon dioxide emissions and global warming. Also like global warming, this makes a wait-and-see approach highly risky—costs are likely to be catastrophically large if we wait for decades to confirm what the evidence already suggests is clear. We need a bias for action.

15 In our discussion of mentoring, "rich" and "poor" refer to the top and bottom quartiles of a composite measure of socioeconomic status.

16 Although Robert Putnam may have coined the term "air bag" in this context, he is not the first person to notice the phenomenon. The anthropologist Sherry Ortner (2006, 99) reports that "I heard, from [upper-middle class] parents and grown children alike, about an amazing array of what I came to think of as "rescuing mechanisms" on behalf of children who seemed to be in trouble: counseling, therapy, rehab programs, tutoring, booster courses, abortions for pregnant daughters, expensive legal services for sons in trouble with the law."

17 Analysis of Monitoring the Future surveys, 1976–2012, the DEA's annual national survey of drug usage among American teens. See also Humensky (2010), 19; and Patrick et al. (2012).

18 See also endnote 45 in chapter 1, Chetty et al. (2014b).

Policy action on income inequality is often stalled by the concern that taxation and redistribution entail reduced economic efficiency—that there is, in the words of economist Arthur Okun (1975), a "Big Tradeoff" between equity and efficiency. Notably, Okun himself argued that this trade-off does not apply to policies that improve equality of opportunity. In fact, failing to address the opportunity gap is expected to be immensely costly for the nation as a whole, largely due to lost labor productivity. Workers who are prevented from developing their full capacities, like the high-scoring eighth graders held back by poverty in figure 8, will contribute far less to general prosperity than they otherwise could.

Holzer et al. (2008) estimate that the total cost of poverty for the U.S. economy, due to lost labor productivity, increased crime, and reduced public health, is at least $500 billion per year. Bradbury and Triest (2014) find that lower social mobility slows economic growth, such that low-mobility cities like Atlanta experience immense costs—if Atlanta had the same equality of opportunity that high-mobility Salt Lake City has, its economy would be 11 percent bigger.[19] If *Our Kids* is right, these costs will sharply increase over the coming decades, reducing the living standards of American children on *both* sides of the socioeconomic divide.

This paper opened by revisiting a period during which the United States faced similar challenges—the Gilded Era of the late 19th century. The gradual process of correcting such a complex, multifaceted problem was assisted greatly by the nature of the U.S. federal system, which provides enormous scope for experimentation on multiple levels of government. Federal-level reforms, like Roosevelt's New Deal, were important drivers of change, but many of the most important institutional innovations originated at lower levels of community governance.

Take the invention of high schools, a central innovation of the Progressive Era. Small towns and villages in the Midwest were forerunners in the "high school movement" from 1910 to 1920. The movement soon spread throughout those states, and then across the country, such that around 73 percent of American teens would enroll in public high school in 1940. In later decades, universal high school education would be the bedrock of the expansion of college education across the socioeconomic classes, improving social mobility and contributing probably more than any other innovation to American economic growth in the 20th century. Public high schools required investment from wealthy families but ultimately benefited rich and poor alike (Goldin and Katz

19 "Metropolitan area" is defined operationally as the "commuting zone" around a central city. We are grateful to Bradbury and Triest for calculating these specific estimates of the implications of their broader quantitative findings. Other relevant recent studies are Hsieh et al. (2013); and Marrero and Rodriguez (2013).

1999). This is a classic example of a policy that simultaneously fostered both growth (by increasing workforce productivity) and equality (by leveling the playing field).

What will be today's equivalent to the Progressive Era's high school? In what follows, some promising candidates for major reform are discussed.

Increasing Working Class Incomes

Research indicates that one most important prescription is to restore working-class incomes. Higher incomes contribute to improving each of the opportunity indicators examined—reducing parental stress, increasing investment in children, improving marriage stability, providing access to safer communities and better schools, and offering more opportunities to network. On the larger scale, increases in working-class incomes are likely to reduce the number of communities marred by high levels of crime and economic segregation.

Increases in family income have especially marked effects upon child development when they occur during preschool and elementary school years. Duncan, Ziol-Guest, and Kalil (2010) find that a $3,000 increase in family income during a child's first five years of life, controlling for other factors, leads to around a 20 percent higher income for the children later in life.

Programs like the Earned Income Tax Credit (EITC) and Child Tax Credit (CTC) go some way toward boosting the incomes of poor families, but they are too small at present, and they only help the working poor—not the poorest of poor children, whose parents have no income to tax. The EITC could be expanded especially for families with young children, and the CTC could be made fully-refundable, so that it reaches the children in the very poorest of households. The poorest children also especially depend upon antipoverty programs like food stamps, housing vouchers, and child care support. Strengthening the part of the safety net that reaches the poorest children is likely to have the greatest value, both for economic growth and equality of opportunity.

Universal Early Childhood Education

One particularly promising intervention is universal early childhood education, which, in its higher-quality forms, may go at least some way toward equalizing child development across the socioeconomic divide. Controlled trials show that high-quality programs positively impact academic results, adult earnings, and criminal behavior, with the more expensive programs providing an estimated 6 to 10 percent return on investment (Heckman 2012; Heckman

et al. 2009).[20] As with the spread of public high schools, early childhood education is spreading rapidly in some states—including in the conservative state, Oklahoma, where 74 percent of four-year-olds were enrolled by 2012 (Gormley, Phillips, and Gayer 2008; Gormley et al. 2005; Gormley et al. 2004).

Such a program can be complemented by other schemes that aid early development, such as paid parental leave in the first year of life and programs that coach poor parents in parenting skills. Successful examples of the latter include Nurse-Family Partnerships, HIPPY, Child First, and the UK Troubled Families initiative (Waldfogel and Washbrook 2011; Baker, Piotrkowski, and Brooks-Gunn 1999; Lowell et al. 2011; Policy Paper 2014).[21]

Reducing Community and School Segregation

Reducing residential class and racial segregation would not only increase diversity in schools, but also provide poorer children access to safer neighborhoods with richer networks and resources. Two proven methods—mandatory inclusionary zoning (MIZ) and community land trusts (CLTs)—involve nonmarket allocation of some of the housing stock. MIZs require new real estate developments to keep a percentage of housing units affordable for low-income families. The first in the United States, the Moderately Priced Dwelling Unit program in Montgomery County, Maryland, now counts 12,000 affordable dwellings (NLIHC 2014). There are more than 100 such programs in California districts alone. In the CLT model, on the other hand, land is owned and developed by a nonprofit whose purpose is to preserve housing affordability for low-income families. CLTs exist in hundreds of U.S. communities, such as Boston's Dudley Neighbors Incorporated and the Burlington Community Land Trust in Vermont.

A final promising approach for reducing segregation is helping families with young children to move out of the most disadvantaged communities. The best-studied example is Moving to Opportunity, which provided vouchers for such families to move to neighborhoods with lower poverty rates. Recent studies suggest that the impacts on children's academic scores and other opportunity indicators can be substantial and are largest where children move early, stay in the new neighborhoods longer, and escape from the most disadvantaged and violent communities (Chetty, Hendren, and Katz 2015; Turner, Nichols, and Comey 2012; Will-Burdick et al. 2011).

20 Other researchers, while agreeing that the rate of return from early childhood education is favorable, view the Heckman estimate as perhaps too high, based as it is on a single landmark study begun in the 1960s of the Perry Preschool in Ypsilanti, Michigan.

21 See also Harrison (2010).

One option for directly reducing socioeconomic segregation in schools is to "soften" or redraw enrollment boundaries (Madar 2015). In cities where rich and poor neighborhoods are close to one another, the necessary boundary changes may be relatively small. In other cases, boundaries may need to be extended to cover both wealthy suburban areas and poorer urban areas—with subsidized busing of children as required. Another strategy is to encourage charter schools to employ parallel admission lotteries, by family income and other demographic characteristics. This approach has significantly increased diversity at schools like Community Roots of Fort Greene in Brooklyn (Kahlenberg and Potter 2012).

On-Ramps to Employment

Whatever merit "four-year college for all" has as an ideal, it is a fact that very few children from disadvantaged backgrounds now obtain four-year degrees. While this disparity must be addressed, there is an undeniable need for alternative on-ramps to successful careers. Three options stand out: career and technical education in secondary schools, apprenticeships in workplaces, and revamped and strengthened community colleges.

Some high schools are pioneering innovative approaches to what is termed "career and technical education." A notable example is the Career Academies program, a school-within-a-school that offers academic and technical training for a specific career and partners with local employers to provide relevant work experience. This approach appears to produce excellent results: A controlled trial found that Career Academy students' later earnings were 17 percent higher than nonparticipants, they experienced no disadvantage in achieving postsecondary degrees, and they were more likely to marry and to live with their biological children (Kemple 2008).

Apprenticeships are another underused on-ramp to work, and in countries like the UK and Germany they are an important non-college track into well paid employment. Apprenticeships combine on-the-job training with coordinated in-class supplementation, and, for isolated poor children, apprenticeships often have the added benefit of providing a potential mentor in their workplace supervisor. South Carolina is one state with a high-quality apprenticeship program supported by modest tax credits of $1,000 per apprentice, and some of the biggest investors in the program have been large German companies like BMW and Bosch. Effective programs can be lucrative for participants: A study of a Washington state apprenticeship program, costing an average of around $5,500 per apprentice, found it increased earnings in the following two and a half years by $78,000 compared to nonparticipants—and expected lifetime earnings increased by a remarkable $440,000 (Workforce Training and Education Coordinating Board 2014).

Community colleges are the third on-ramp outside the college track and play a crucial role in encouraging upward mobility. However, at present they have low completion rates—barely one-third of students emerge with a two- or four-year degree within six years (Shapiro et al. 2014). This is in part due to the immense challenge of teaching underprepared students and the insufficient resources that community colleges typically receive. The high drop-out rate is also a reflection of the challenges facing underprepared kids who lack social support as they try to navigate the complexities of today's community college offerings.

But these challenges are not insurmountable. The Accelerated Study in Associate Programs (ASAP) initiative at the City University of New York (CUNY) is one of the most effective community college interventions yet designed. It combines intensive advising and career counseling, highly structured degree pathways to reduce the complexity of navigating a pathway to graduation, a requirement that students attend full-time, and financial supports like free public transportation and textbooks. A carefully controlled study found it doubled graduation rates (Scrivener et al. 2015). Additional investment was required, but by dramatically increasing graduation rates the program lowered the total cost per degree.

Other Levers

There are many other promising interventions beyond the above list, and likely many that have yet to be invented. Notable options include reducing incarceration rates for non-violent crimes, such as many of those associated with the war on drugs (Shoenberger 2012);[22] accepting the kaleidoscopic nature of family structure in the 21st century and shifting the stigma from *unwed* parenting to *unplanned* parenting; and replacing failed community ties with high-quality mentoring and coaching programs, with institutions such as churches, schools, or AmeriCorps leading the charge.

Conclusion

Equal opportunity is set to diminish in America in coming decades. Across all ethnicities, poorer and wealthier children have diverged on a range of important opportunity indicators: the structure of their families, the money spent by parents and the time spent with their parents, access to extracurricular activities, test scores in schools, college entrance and especially college completion, and much beyond. These factors in turn shape each child's endowment of cognitive and noncognitive skills, as well as their access to human, cultural, and

22 See also Sykes and Pettit (2014).

social capital. Growing gaps between poor and wealthy children translate into starkly diverging destinies.

This opportunity gap is a "purple," bipartisan problem with the potential to galvanize red and blue Americans alike. Both have legitimate arguments about its causes: Progressives rightly identify the deterioration of economic conditions for working-class families as a key trigger of these trends, but the cultural changes bemoaned by conservatives undeniably have played an important role. Both have strong reasons to be concerned about its economic effects: Progressives may emphasize equity, while conservatives may emphasize the importance of economic growth, since the nation is, at present, effectively squandering the talents of one-third of its future workforce. Finally, there are shared values at stake: For all their differences, both sides of American politics cherish what Bernanke described, at the outset of this paper, as the "bedrock principle of equality of opportunity."

Fittingly, then, promising policy innovations are emerging in red and blue jurisdictions alike, from the early childhood education investments of Oklahoma to apprenticeship programs in Washington state. If history is to be our guide, widespread experimentation will be essential to solving the problem. The Gilded Age of the late 19th century was transmuted into wider prosperity only through policy experimentation on all levels of government, from the public high schools that sprouted in small Midwestern towns to the sweeping changes of Roosevelt's New Deal.

The evidence reviewed by this paper points to the urgency of such reforms. Given the lagging nature of social mobility measures, today's data reveal only the tip of the oncoming iceberg. Delay will allow opportunity gaps to further expand, increasing the task ahead and dooming a large part of a generation to despair. It is advisable, then, to err on the side of action. Examples of promising reforms include increasing lower-class incomes, making early childhood education universal, desegregating schools and neighborhoods, and improving on-ramps to well-paid employment outside of the four-year college track. Restoring equal opportunity will be costly; ignoring it will be costlier still. ■

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Intergenerational Correlations in Wealth

FABIAN T. PFEFFER
University of Michigan

ALEXANDRA KILLEWALD
Harvard University

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*Please direct all correspondence to Fabian T. Pfeffer, University of Michigan, 426 Thompson Street, 3240 Institute for Social Research, Ann Arbor, Michigan 48104, **fpfeffer@umich.edu**.*

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Introduction

Inequality in U.S. family wealth is high and increasing (Pfeffer, Danziger, and Schoeni 2013; Piketty 2014; Wolff 2014), which raises concerns about whether the greatly unequal distribution of wealth between families is also bound to be maintained across generations (Conley 1999; Oliver and Shapiro 1995). Of course, both sociologists and economists have long been interested in the transmission of socio-economic advantage across generations (Becker and Tomes 1979; Blau and Duncan 1967). However, wealth has rarely been considered in this perspective, although it is an important and distinct dimension of economic success (Spilerman 2000). Instead, the study of intergenerational persistence is still chiefly concentrated on income and occupations (Torche 2015).

Studies of intergenerational correlations (especially in occupational standing) have also long paid attention to the channels of intergenerational status transmission, with education a key mediator of interest. We hypothesize that education is likely to also be an important mediator of the intergenerational transmission of wealth, given the role of parental wealth in facilitating access to and attainment of higher education (Conley 2001a) and the advantage of those with higher education in accumulating assets (Conley 2001b; Keister 2003). However, in the case of wealth, unlike education or earnings, there is also an obvious direct mechanism for the propagation of inequality across generations: Wealth can be directly transferred across generations through bequests and inter-vivos transfers (Kotlikoff and Summers 1981; Kohli 2004). The direct transmissibility of wealth from one generation to the next may mean that we observe the same money as wealth in multiple generations. We document descriptively how the estimated intergenerational transmission of wealth changes when we account for these two channels of transmission: education and inheritance. We do not attempt to make causal claims about the role of each factor in mediating intergenerational wealth rigidity but identify these two characteristics as important correlates of both parental and child wealth to help direct the search for further explanations of rigidity in the wealth structure.

Our analyses substantially improve and expand the few prior estimates of intergenerational correlations in wealth. Existing evidence on intergenerational rigidity in the U.S. wealth distribution comes from a small number of

studies, which, like ours, use data from the Panel Study of Income Dynamics (PSID) but, unlike ours, were only able to examine the wealth outcomes of younger adults (Charles and Hurst 2003; Conley and Glauber 2008; Mulligan 1997). This limitation was imposed by data restrictions at the time of analysis and already acknowledged in that research, suggesting that it would be more appropriate to measure wealth at later ages when adults have had more time to accumulate assets (Charles and Hurst 2003, fn.5; Conley and Glauber 2008, p. 10). We hypothesize that adults' wealth will more closely resemble that of their parents as both generations enter middle and late adulthood, aging out of the period of intensive investments in young adulthood and increasingly accumulating assets. Drawing on newly available data from the PSID, we update estimates of intergenerational wealth correlations and test whether intergenerational wealth transmission indeed strengthens from early through late adulthood.

Additionally, we examine the contours of the intergenerational reproduction of wealth. We hypothesize that wealth positions at the top and bottom of the distribution may be particularly sticky, with very wealthy parents able to secure a substantial wealth advantage for their children, and parents without assets especially likely to have adult children who also fail to accumulate any wealth. When the intergenerational transmission of wealth is measured with a single parameter, such as an intergenerational elasticity, this variability is lost. Evaluating the persistence of the highest levels of wealth across generations also speaks to concerns about a wealthy elite that wields dynastic financial power.

Together, our analyses offer a rich description of the intergenerational persistence of wealth across generations, how these patterns differ across the wealth distribution, and to what extent education and inheritance can account for these intergenerational associations. Our analyses mitigate the great imbalance of a large literature focused on the description of intergenerational correlations in other dimensions of socioeconomic standing, mostly occupational classes or income.

Theoretical Motivation and Prior Work

Compared to income and earnings, wealth in the United States is substantially more unequally distributed (Keister and Moller 2000). Access to wealth is in turn associated with a wide range of outcomes, including longevity, family formation, and the educational achievement of offspring (Belley and Lochner 2007; Bond Huie et al. 2003; Charles, Hurst, and Killewald 2013; Conley 1999, 2001a; Haveman and Wilson 2007; Morgan and Kim 2006; Orr 2003; Pfeffer 2011; Schneider 2011). Furthermore, these associations are not fully

explained by standard measures of socioeconomic advantage, such as income, education, and occupation. The wealth distribution is thus an important and distinct measure of the concentration of social inequality and advantage.

Wealth can be passed directly to subsequent generations through bequests or inter-vivos transfers, such as assistance with the down payment on a first home (Charles and Hurst 2002). Family wealth can also be used to facilitate wealth-generating investments of the next generation, most notably postsecondary education (Conley 2001a; Pfeffer 2011).

Prior Estimates of Intergenerational Wealth Correlations and Potential Life-Cycle Bias

While a large literature in economics and sociology has investigated intergenerational associations in income, occupations, and education (Blau and Duncan 1967; Hertz et al. 2007; Long and Ferrie 2013; Pfeffer 2008; Rosenfeld 1978; Solon 1999), our knowledge of how similar the wealth of parents is to the wealth of their offspring relies on very few studies. In part because of data limitations, the three most comprehensive evaluations of intergenerational wealth mobility have relied on wealth outcomes for the second generation at relatively young ages. Mulligan (1997) measures both parent and child wealth in 1984 and 1989, averaging if possible, for children at most age 38 in 1989. Charles and Hurst (2003) estimate the correlation between children's wealth in 1999 and parental wealth averaged between 1984 and 1989. In order to estimate pre-bequest and pre-retirement associations, parents are required to be not yet retired in 1984 and 1989 and surviving in 1999. As a result, the average adult offspring in their sample is just under 38 years old. Conley and Glauber (2008) measure the wealth of young adults ages 24 to 40 in 1999 to 2003, restricting their sample to young adults whose parents' wealth was measured in 1984, when the offspring generation was ages 6 to 21. All three studies estimate an intergenerational wealth elasticity based on the correlation in logged parent and child wealth. Charles and Hurst estimate an elasticity of 0.37, while Conley and Glauber estimate a substantially lower 0.28. Mulligan's OLS-estimated elasticity falls in between at 0.32, but an instrumental variables approach designed to correct for attenuation bias produces an estimate of 0.43.[1]

1 The difference in the estimates may be due to a number of factors, but one prominent difference is the treatment of those with nonpositive net worth. Previous evidence suggests that the association between parental wealth and the wealth of their young adult children is much weaker for offspring who are net debtors (Killewald 2013). Thus, the lower elasticity estimated by Conley and Glauber may be because they bottom-code wealth for offspring with nonpositive net worth, while both Mulligan and Charles and Hurst excluded this group. We return to this point in our analyses.

To put these estimates in context, Solon (1992) estimates that the intergenerational correlation in (quasi) permanent income between fathers and sons is 0.41, and subsequent studies have confirmed this estimate (Chetty et al. 2014; Solon 1999) or found even higher intergenerational income elasticities (Mazumder 2005; Mitnik et al. 2015). The intergenerational persistence in years of education in the United States is similar in size (Couch and Dunn 1997; Hertz et al. 2007), as is the intergenerational persistence of occupational status (Blau and Duncan 1967). Given that wealth is both more unequally distributed than income and education and easier to transmit directly between generations, it is surprising that prior estimates of the intergenerational transmission of wealth suggest comparable social reproduction as for other measures of socioeconomic advantage.

We hypothesize that these prior estimates, based on the accumulated wealth of the second generation at relatively young ages, may have underestimated the intergenerational persistence of wealth—a phenomenon referred to as life-cycle bias. Life-cycle bias has been shown to affect intergenerational earnings correlations, even with controls for parent and child age; correlations are much higher during middle adulthood than either younger or older adulthood (Mazumder 2015). For wealth, we expect rising intergenerational correlations through pre-retirement late adulthood, given the continued accumulation of assets, making it even more pressing to evaluate whether prior studies have underestimated the intergenerational reproduction of wealth by focusing on younger adults.

In support of the hypothesis of life-cycle bias, using Swedish data, Adermon, Lindahl, and Waldenström (2015) find that the rank-rank correlation in intergenerational wealth is 50 percent higher when second-generation wealth is measured at an average age of 47, rather than an average age of 32. Although previous research on intergenerational wealth transmission in the United States has recognized that later adulthood is preferable for measuring intergenerational wealth correlations (Charles and Hurst 2003; Conley and Glauber 2008), until recently the PSID had not been collecting wealth information for long enough to measure both parents' and offspring's wealth at midlife. Using data from the 1984–2013 waves of the PSID, we construct a sample of parent-child pairs that spans a larger age range in the second generation and test how the intergenerational transmission of wealth differs across the life course.

Rigidity across the Wealth Distribution

Recent research focused on historical trends in persistence at the very top of wealth distribution has documented much higher intergenerational

correlations than those based on the entire population (e.g., Piketty 2014).[2] Previous research documents that intergenerational wealth associations are stronger at higher positions in the parental wealth distribution (Adermon et al. 2015; Hansen 2014; Killewald 2013). We expect that the nonlinearity of this relationship will be even stronger later in adulthood and following bequests, which are highly skewed (Avery and Rendall 2002).

However, consistent with previous research on the intergenerational reproduction of poverty (see Corcoran 1995 for a review), we expect that children born to asset-poor parents may also be particularly likely to reproduce their parents' position in the wealth distribution. Research by Sharkey (2008) demonstrates that, for African Americans, the intergenerational transmission of neighborhood context is concentrated at the bottom of the distribution. Given the importance of assets for homeownership and neighborhood selection, spatial patterns suggest another mechanism by which the reproduction of wealth may be concentrated at the bottom of the distribution. This is consistent with the notion of an intergenerational "underclass," with children raised by extremely economically, spatially, and socially disadvantaged parents likely to experience the same deprivations as adults (Wilson 1987).

Using mobility tables, Charles and Hurst (2003) and Conley and Glauber (2008) both find greater intergenerational reproduction of wealth at the top and bottom of the wealth distribution, compared with the middle. Using our sample of older adults, we assess differences in the degree of wealth transmission across the full wealth distribution.

Channels of Intergenerational Wealth Transmission

Finally, we describe how the intergenerational correlation in wealth changes when we adjust for possible mechanisms underlying this association. Prior research finds little role for genetic endowments in the intergenerational transmission of wealth (Black et al. 2015) and therefore ascribes it mostly to environmental factors. Those may either be direct monetary transfers from parents to offspring or indirect investments by parents in asset-generating attributes of offspring. We consider two channels in detail: bequests and education.

2 Research based on historical register data often shows much higher intergenerational wealth correlations (Clark 2014; Kearl and Pope 1986; Menchik 1979), perhaps due to these studies' reliance on wealth measures derived from death records that include all bequests and transfers ever received. However, other factors may also account for the high correlation, such as the focus on the top of the wealth distribution (wealth measures in death records are available only for individuals who had significant wealth to bequest) or the restriction to a specific population (e.g., Mormons in Utah) or historical time (this research mostly studies the 18th and 19th centuries).

Bequests and transfers are extremely unequally distributed and have been estimated to account for somewhere between 40 and 80 percent of aggregate net worth (Gale and Scholz 1994; Piketty 2014). Using Swedish data, Adermon et al. (2015) find that inheritance can (descriptively) explain the majority of the intergenerational correlation in wealth. Bequests are thus a likely mechanism by which rigidity in the wealth structure is maintained. They also occur relatively later in life. This implies a likely downward bias in prior estimates of the intergenerational wealth correlation because correlations are estimated before the occurrence of bequests from the parent, either simply because the second generation is young (Conley and Glauber 2008), or because of requirements about survivorship of the parental generation (Charles and Hurst 2003; Mulligan 1997). Assessing wealth in the child generation at a higher age is therefore valuable in part because it allows us to include more individuals who have received bequests. In fact, the average age of our child sample coincides with the expected average age of receiving bequests (~50 years; see Piketty 2014, p. 389). We also descriptively assess the degree to which bequest and transfer receipt account for the intergenerational wealth correlation.

Prior research has documented strong associations between parents' wealth and their children's educational outcomes (Conley 2001a; Morgan and Kim 2006; Belley and Lochner 2007; Haveman and Wilson 2007; Orr 2003; Pfeffer 2011) and paying for higher education is a likely moment for inter-vivos wealth transfers from parents to offspring (Conley 2001a; Schoeni and Ross 2005). Since income returns to educational attainment should translate into different patterns of asset accumulation, and education itself is associated with wealth net of income (Conley 2001b; Keister 2003), we expect that education is a mediator of intergenerational persistence in wealth. Furthermore, education and income are associated with not only higher wealth levels but also faster rates of wealth accumulation (Conley 2001b). Therefore, we also expect that the education mechanism leads to higher intergenerational wealth correlations as early adulthood investments increasingly pay off as offspring age.

The two channels selected, educational investments and bequests and transfers, are likely to be of different importance at different points in the offspring's life course. Parental bequests tend to occur during middle adulthood of those bequeathed. In contrast, the assessment of education's role will point to a mechanism of intergenerational wealth transmission much earlier in life.

Charles and Hurst (2003) also consider mechanisms of intergenerational wealth transmission, specifically (lifetime) income, education, prior transfers and anticipated bequests, and the types of assets held. To assess the role of each channel, they add controls for both the parent and child value to the regression model estimating the intergenerational association in wealth. For

example, by controlling for parent and child education, they estimate the extent of intergenerational reproduction in wealth that is independent of any intergenerational reproduction of education. They find, perhaps unsurprisingly, that the similarity between parents and children in their income-earning potential—lifetime income—is the largest contributor to the intergenerational wealth association, explaining about half of the association. The intergenerational reproduction of education explains about one-fourth of the association, 17 percent is explained by prior gifts received by the child and anticipated bequests of the parents, and a little over one third is explained by intergenerational similarity in asset types held. Net of similarities in income, education, and transfers have little additional explanatory power, nor do shared-risk preferences between parents and children.

We pursue a somewhat different approach. First, in our analysis of the mediation of two-generational correlations we adjust only for children's characteristics (education and gifts/bequests received) but not the characteristics of parents. Charles and Hurst aim to estimate the extent of intergenerational wealth reproduction independent of the intergenerational reproduction in other factors, essentially assuming that parental wealth is a spurious factor associated with both parental education and child education, rather than viewing the latter as a mediator of this association. We make the opposite assumption. Our assumption is in keeping with our descriptive focus on channels of wealth transmission: We seek to understand the potential role for parental investments in child outcomes. Because education is positively correlated between parents and children, our estimates will be more conservative in terms of the share of the wealth correlation explained by each factor.

Second, we consider a narrower range of mechanisms. As described previously, we do not consider asset types, including homeownership, out of concern that they are endogenous with children's own wealth. Charles and Hurst's finding that education explains little of the intergenerational transmission of wealth net of income is important, as it indicates that the importance of education as a channel of transmission is largely through education's effect on income, rather than other mechanisms, such as enhanced financial skills. However, interpreting the mediating role of income is challenging: We learn that much of the between-generation similarity in wealth is because generations are similar in their ability to bring in income that can be used for savings, but we still do not know why this is true. By focusing on education and inheritance, we identify channels that are more directly subject to parental manipulation—parental action that seeks to increase offspring wealth directly through transfers or indirectly through investments in their future income- and wealth-generating potential.

Data

The PSID's genealogical design makes it ideal for intergenerational analyses: Children born to PSID households eventually become PSID respondents themselves as they form their own households. The PSID is the only nationally representative panel study that has been in the field long enough to include both a second and a third generation of adult survey respondents (Pfeffer 2014). The PSID has collected information on housing wealth since its inception in 1968 (home values starting in the first wave and also mortgages starting in 1969). Since 1984, every five years until 1999 and every wave since then, PSID has collected detailed information on families' assets, which allows the calculation of a family's net worth.

We take advantage of the earliest (1984–89) and latest (2011–13) wealth data collected in the PSID, spanning almost three decades and including a decade more wealth data than prior contributions that assessed wealth correlations based on the PSID. The full analytic sample contains 4,567 individuals aged 25–64 in 2013 and their parents, aged 25–64 in 1984, when they reported their own wealth for the first time. We link children to their biological or adoptive parents using PSID's family identification mapping system. For parents who do not live in the same household in 1984, for instance because they are divorced, we sum the net worth of parents if they are both observed in separate households (5 percent of the weighted sample). Where only the mother (20 percent) or the father (3 percent) are observed, we take her/his household net worth as the sole indicator of parental wealth. One could instead impute the net worth of the missing parent, but we are not convinced that doing so is preferable, since the missing parent may be genuinely missing from the child's life (including due to death) and therefore should not count toward that child's wealth background as well as because imputations of a missing partner's wealth may have limited accuracy. Still, analyses that do use imputed wealth of the missing parent produce very similar results (available upon request).

The PSID is not the only nationally representative survey that collects information on net worth. The Survey of Consumer Finances (SCF), often considered the gold standard among wealth surveys, does not track offspring wealth and therefore does not contain the necessary data to estimate intergenerational wealth correlations. Recent research has shown that the PSID wealth measures compare very favorably to the SCF wealth measures, attesting to the high validity of the former (Pfeffer et al. 2014). Since 1985, the National Longitudinal Survey of Youth 1979 (NLSY79) has also collected information on respondents' net worth, but, like the SCF, does not measure parental wealth and therefore does not allow the estimation of intergenerational wealth correlations.

Our main wealth measure is family net worth, which is the sum of all financial assets, real assets, and home equity, minus any financial obligations.[3] To reduce measurement error, we average wealth measures across two adjacent survey years (2011 and 2013 for the offspring generation, 1984 and 1989 for the parents). All dollar values are adjusted for inflation and expressed in 2013 dollars. Our main results do not adjust wealth for family size, but models based on wealth measures adjusted by the square root of family size yielded numerically similar and substantively equivalent results (available upon request).

In our models that assess the mediating role of education in the intergenerational transmission of wealth, we use offspring's highest educational degree attained (less than high school, high school, some college, B.A., and postgraduate degree). For bequests, we draw on a direct survey question, asked in each wave of the PSID, on whether any large gift or inheritance of over $10,000 has been received and, if so, the value. We cumulate this information across all waves to approximate the total value of gifts and bequests ever received by children.

Methods

A large literature on intergenerational associations in economic status (Black and Devereux 2011; Solon 1999) and prior work on intergenerational wealth correlations (Mulligan 1997; Charles and Hurst 2003) apply an OLS regression approach to estimate intergenerational correlations as age-adjusted elasticities. For wealth, this model is

$$\ln W_c = \alpha + \beta_1 \ln W_p + \beta_2 \text{Age}_c + \beta_3 \text{Age}_c^2 + \beta_4 \text{Age}_p + \beta_5 \text{Age}_p^2 + \varepsilon c \quad (1)$$

with $\ln W_c$ the natural log of offspring net worth, $\ln W_p$ the natural log of parental net worth, and with quadratic controls for child and parental age (average of maternal and paternal age if both are observed) Since both offspring and parental net worth are logged, β_1 can be interpreted as an elasticity—i.e.,

3 The PSID asks a series of questions on different asset types, including home values, mortgages, checking accounts, savings, money market holdings, CDs, government saving bonds, Treasury bills, stocks, mutual funds, investment trusts, bond funds, life insurance cash, valuable collections, trust or estate rights, farm or business wealth, real estate, vehicle wealth, private annuities, IRAs, and various forms of debt. The net worth measure used here, which sums all of these components, does not include pension wealth, i.e. neither defined-benefit pensions (more prevalent in the parent generation) defined-contribution pensions (more prevalent in the child generation). Using pension-augmented wealth may yield higher estimates of intergenerational persistence if the intergenerational similarity in pension holdings is higher than in the other asset components.

as the predicted percent change in offspring wealth from a 1 percent change in parental wealth.

The log-log specification reduces the impact of high wealth outliers, which is important given the vastly unequal distribution of wealth, but it suffers from two important drawbacks. First, it cannot easily incorporate households with zero wealth or net debt: they are either dropped from the sample (Charles and Hurst 2003; Mulligan 1997) or set to a floor value (Conley and Glauber 2008). This is particularly important because nearly one in five individuals in our sample of the offspring generation has zero or negative net worth (i.e., net debt), and among younger cohorts (25–44 in 2013) the share rises to one in four. Second, comparing elasticities across groups or time is complicated by the fact that they are a product of both the intergenerational correlation (exchange mobility) and the variances in both generations (marginal distributions).

We therefore prefer a different specification to assess and compare exchange mobility in wealth:

$$\text{rank}W_c = \alpha + \lambda_1 \text{rank}Wp + \lambda_2 \text{Age}_c + \lambda_3 \text{Age}_c^2 + \lambda_4 \text{Age}_p + \beta\lambda_5 \text{Age}_p^2 + \varepsilon_c \quad (2)$$

Instead of the logarithm of net worth (equation 1), we measure child wealth ($\text{rank}W_c$) and parental wealth ($\text{rank}W_p$) as the percentile rank in their respective weighted net worth distribution. This specification allows us to assess the full distribution of wealth, since it easily accommodates cases of zero wealth and net debt. Also, the rank slope coefficient (λ_1) is insensitive to differences in the marginal distributions across groups (Chetty et al. 2014; Jäntti and Jenkins 2014) and therefore more easily compares groups. In addition, it has recently been shown by Mazumder (2015) that, at least in the context of income correlations, rank-rank slopes are much more robust to life-cycle bias and attenuation bias due to measurement error than are intergenerational elasticities.

After estimating the average intergenerational association in wealth, we document variation in this association across substantively important subgroups by estimating subgroup-specific models. In particular, we test our hypothesis that wealth transmission is more pronounced at older ages, dividing the sample into four age groups: 25–34, 35–44, 45–54, and 55–64. We also separately analyze wealth correlations by gender and race and compare wealth correlations before and after the Great Recession.

To assess variation in intergenerational wealth rigidity across the wealth distribution of both parents and offspring, we formally test whether the correlation between parental and offspring wealth is nonlinear (see Mitnik et al. 2015). We then move to mobility tables (transition matrices) as a flexible approach to assess potential nonlinearities in the wealth association across generations. Sociologists studying intergenerational mobility by occupation or education have often used mobility tables to assess *where* immobility is particularly pronounced (see the

discussion in Erikson and Goldthorpe 2002). Like the rank-rank correlations, mobility tables easily incorporate the experiences of net debtors—a substantial share of our adult offspring sample. For these and all following analyses, we restrict the sample to parent-child pairs in which the offspring is ages 45–64 (N=1,975), to document patterns after offspring have had time to accumulate assets across a substantial portion of their adult lives. We divide both the parent- and offspring-weighted wealth distributions into generation-specific quintiles and examine transition probabilities across cells, testing the possibility that rigidity is particularly pronounced at the top and bottom of the distribution.

To assess the contribution of the two channels of transmission that we hypothesized to underlie intergenerational wealth correlations, inheritances or transfers and education, we enter controls for these characteristics into equation (2) and observe the degree to which they mediate—separately and jointly—intergenerational correlations. For the mediation of the parent-child correlation, we control for children's educational attainment and amount of gifts or inheritance received to date, cumulating across years.

All of our analyses are weighted by the family weight of the parents (averaged across the two measurement points), and standard errors are clustered by the original sample family. Neither of these two adjustments, however, substantively alters our findings. Since we draw on imputed wealth measures provided by the PSID there is no need for imputation of missing values, and we also have no missing values on education or inheritance.

In extended analyses, not reported here for reasons of space, we expand our assessment beyond parent-child correlations to the multigenerational transmission of wealth, drawing on a range of indicators of grandparental wealth (Pfeffer and Killewald 2015). There, we also provide an in-depth study of race differences in wealth correlations, which are facilitated by PSID's oversample of African American households.

Results

Descriptives

Descriptive statistics for our full analytic sample are displayed in table 1. As argued before, the latest PSID data allow us to capture the wealth of children and parents at more similar and higher ages than prior research: The mean age at which we observe parents (in 1984) is 43.4 years and 44.6 years for children (in 2013). Half of the offspring are observed during their peak time of wealth, between 45 and 64 years of age. The close similarity of mean ages across two generations protects our estimates of two-generational correlations from life-cycle bias.

Table 1. Descriptives (N=4,567)

DEMOGRAPHICS	MEAN OR %	(STD.DEV.)
AGE		
Offspring: Age in 2013	44.6	(10.8)
Parents: Average age in 1984	43.4	(11.0)
OFFSPRING AGE GROUPS (AGE IN 2013)		
Age group 25–34	22.5%	
Age group 35–44	27.2%	
Age group 45–54	28.9%	
Age group 55–64	21.4%	
OFFSPRING RACE		
White	83.1%	
African American	12.5%	
Other	4.4%	
OFFSPRING SEX		
Male	48.1%	
Female	51.9%	

NET WORTH	MEAN OR %	(STD. DEV.)
NET WORTH		
Offspring: Average 2011–13	289,311	(1,054,904)
Offspring: Average 2005–07 (pre-recession)	322,609	(1,219,812)
Parent: Average 1984–89	337,589	(985,775)
SHARE OF CASES WITHOUT WEALTH (ZERO OR NET DEBT)		
Offspring: 2011–13	18.5%	
Offspring: 2005–07 (pre-recession)	14.0%	
Parent: 1984–89	5.6%	

NET WORTH	MEAN OR %	(STD. DEV.)
NET WORTH QUINTILES OFFSPRING (AVERAGE 2011–13)		
Quintile 1 (lowest)	-32,597	
Quintile 2	11,349	
Quintile 3	62,170	
Quintile 4	196,615	
Quintile 5 (highest)	1,210,295	
NET WORTH QUINTILES: PARENTS (AVERAGE 1984–89)		
Quintile 1 (lowest)	3,677	
Quintile 2	54,593	
Quintile 3	135,922	
Quintile 4	283,126	
Quintile 5 (highest)	1,212,501	

MECHANISMS	MEAN OR %	(STD. DEV.)
OFFSPRING: HIGHEST EDUCATIONAL DEGREE ATTAINED (2011/2013)		
Less than high school	4.7%	
High school	25.0%	
Some college	32.7%	
BA	23.6%	
Post-graduate	13.9%	
OFFSPRING: LARGE INHERITANCE OR GIFT RECEIVED (THROUGH 2013)		
Whether received gift/ inheritance	28.7%	
Value of gift/inheritance	51,260	(488,590)
Value of gift/inheritance (among those receiving)	181,808	(907,546)

Note: All dollar values are 2013 dollars.

Mean net worth decreased from the $337,589 in the parent generation to $289,311 in the child generation, in line with prior assessments of trends in the wealth distribution between those years (Pfeffer et al. 2014). More than two-thirds of the lower net worth in the child generation is accounted for by losses during the Great Recession. Offspring mean wealth was $322,609 in 2005–07, before the large-scale asset destruction brought about by the collapse of the housing and stock markets. Similarly, the share of offspring with zero or negative net worth dramatically increased from 14 percent pre-recession to 18.5 percent after the recession, compared with less than 6 percent of parents in 1984–89.

Given that nearly one-fifth of the offspring sample held no wealth, it is unsurprising that the bottom 20 percent of the offspring hold $32,597 in net debt, on average, compared with $3,677 in net worth for the parent generation. The net worth of the middle wealth quintile of the offspring generation averages less than half the value in the parental generation ($62,170 vs. $135,922).

Wealth Correlations

Table 2 shows the estimated intergenerational elasticities and rank correlations in net worth. Our baseline estimate of the elasticity in net worth is 0.41, similar to the prior estimate of 0.37 from Charles and Hurst (2003).[4] Applying a common interpretation that assumes constant elasticity, this implies that a 1 percent increase in parental net worth is associated with a predicted increase of 0.41 percent in offspring wealth. Or, a doubling of parental wealth is associated with a predicted increase of 32 percent ($2^{0.405}$=1.32) in offspring wealth.

We find sizable gender differences in wealth elasticities. Using the same interpretation, the estimates imply that a doubling of parents' net worth is associated with an increase in net worth by 38 percent ($2^{0.466}$=1.38) for sons but only 28 percent ($2^{0.358}$=1.32) for daughters. However, the direct comparison of these two estimates is challenged by two complications. First, since they are based on logarithmically transformed net worth variables, they exclude cases with zero wealth or net debt, excluding a somewhat higher share of daughters (20 percent) than sons (17 percent). Second, as discussed above, elasticities are sensitive to the marginal distribution, in this case, group differences in the variance of wealth. The wealth distribution for daughters is substantially more compressed than for sons (44 percent lower variance).

4 Conley and Glauber (2008) found an appreciably lower elasticity of 0.28 based on a net worth measures that was bottom coded at $1 before logarithmic transformation. Doing so reduces the elasticity in our sample to 0.33 and foreshadows some of the issues around nonlinearity in the elasticity that we discuss in more detail below.

Table 2. Intergenerational correlations in net worth

	ELASTICITY	SE	N	RANK SLOPE	(SE)	N	RANK SLOPE (AGE-STANDARDIZED)	(SE)	N
Overall	**0.405*** **	**(0.035)**	**3,202**	**0.371*** **	**(0.019)**	**4,567**			
BY SEX									
Male	0.466***	(0.046)	1,515	0.377***	(0.028)	2,040			
Female	0.358***	(0.046)	1,687	0.367***	(0.024)	2,527			
BY AGE (4 GROUPS)									
Age 25–34	0.361***	(0.056)	776	0.312***	(0.037)	1,313	0.312***	(0.037)	1,313
Age 35–44	0.400***	(0.055)	839	0.363***	(0.040)	1,257	0.360***	(0.039)	1,257
Age 45–54	0.368***	(0.060)	885	0.394***	(0.033)	1,171	0.428***	(0.034)	1,171
Age 55–64	0.509***	(0.068)	683	0.411***	(0.040)	804	0.421***	(0.042)	804
BY AGE (2 GROUPS)									
Age 25–44	0.390***	(0.038)	1,615	0.343***	(0.026)	2,570	0.337***	(0.026)	2,570
Age 45–64	0.418***	(0.052)	1,568	0.403***	(0.027)	1,975	0.427***	(0.027)	1,975
BY RACE									
White	0.388***	(0.043)	2,149	0.349***	(0.023)	2,716			
African American	0.087	(0.062)	921	0.114*	(0.054)	1,657			
BY PERIOD									
Pre-Recession (2005–07)	0.373***	(0.034)	2,959	0.351***	(0.020)	3,970			

Note: Statistical signifance levels at * p<.05, ** p<.01, and *** p<.001 based on two-tailed tests.

Together, these factors contribute to deflate the elasticity for daughters compared to sons.

The rank correlations presented in table 1 address both issues and are therefore much more suitable for group comparisons of the size of intergenerational associations (see also Jäntti and Jenkins 2014). Here, the overall degree of association between parental wealth and children's wealth is 0.37 and virtually the same for sons and daughters. A rank slope of 0.37 means that an advantage of 10 percentiles (one decile) in the parent generation is associated with an advantage of 3.7 percentiles (about one-third of a decile) in the child generation.

We also focus on rank correlations to meaningfully compare the degree of intergenerational wealth correlation across age groups. The correlation rises greatly with increasing age, from 0.31 among offspring aged 25–34 to more than one-third higher, 0.41 for offspring aged 55–64 in 2013. These findings support the hypothesis that intergenerational wealth correlations rise with age. Since we also assess the two generations at similar ages within each age group (i.e., the average age of parents in our sample rises with children's age; r=0.88), one conclusion is that the similarity in wealth between parents and their children increases as both of them accumulate assets.

Because of the importance of mid- and later-life wealth for both retirement and investments in the next generation, we argue that estimates of rigidity in the wealth structure should ideally be based on measures of wealth attainment during older adulthood. Based on the rank slopes, we observe that intergenerational similarity is high and relatively stable among the older two age groups (45–54 and 55–64). In the following analyses, we therefore focus on the group of children aged 45 to 64.

We find a very similar age-gradient in the rank slope when the ranks are drawn within each age group rather than the entire sample (rightmost section of table 2). Consequently, the rising intergenerational wealth correlation with age not only means that children from wealthier households move up in the overall distribution of wealth, but that they also move up relative to their less wealthy but similarly aged peers.

We also find that the intergenerational correlation in wealth positions is less than one-third as strong for African Americans as for whites (0.11 versus 0.35). Vast and well-documented differences in the distribution of wealth between these two groups (Kochhar, Fry, and Taylor 2011; Oliver and Shapiro 1995) call for a more in-depth exploration of race differences in intergenerational wealth transmission, which we cannot include here for reasons of space (but see Pfeffer and Killewald 2015).

Finally, we note that the intergenerational correlation in wealth was virtually the same before and after the Great Recession (0.35 and 0.37, respectively). Although to different intensity, wealth losses hit American households

across the wealth distribution, and it appears that these distributional shifts have not appreciably altered wealth positions of families when compared across generations.

Rigidity across the Wealth Distribution

For the reasons previously discussed, we believe that the strength of the intergenerational transmission of wealth is likely to vary across the wealth distribution. We follow Mitnik et al. (2015) and test for nonlinearities in the intergenerational associations by assessing the fit of alternative model specifications that include nonlinear terms, either squared parental wealth or, more flexibly, a spline function with knots at the quintiles. Both specifications provide clear evidence against the constant association assumption (based on global F-tests; results not shown).

Therefore, to examine intergenerational associations in wealth across the wealth distribution, we use mobility tables that cross-tabulate parental and offspring's wealth quintiles, restricting the sample to 45–64-year-olds in 2013 and their parents and drawing the quintiles based on the weighted wealth distribution within this age group.

Table 3 shows the resulting mobility table and displays row or "outflow" percentages, which identify what percentage of the members from a given quintile of the parental wealth distribution are found in each quintile of the offspring wealth distribution. For each quintile, offspring are more likely to end up in the same quintile as their parents than expected by random chance (all on-diagonal cells have outflow percentages greater than 20). However, intergenerational persistence of wealth is much higher at the top than in any other quintile: 44 percent of children from the highest parental wealth quintile also end up in the highest wealth quintile themselves (corresponding to a total net worth of around $331,000 or more), and about 70 percent end up in one of the top two quintiles ($108,000 or more).[5] Furthermore, we observe a U-shaped pattern of immobility commonly found in mobility analyses. Immobility is lowest for children from the middle 20 percent of the wealth distribution (with parental net worth between $89,000 and $195,000). But, although these children appear to be about equally likely to move into any of the bottom four quintiles, a clear barrier to enter the top quintile is also apparent, with only 12 percent of these children accessing it. Finally, intergenerational persistence is again higher for children from the bottom quintile,

5 Further adjustments for remaining age differences within this group, based on quintiles drawn from age-residualized distributions, do not appreciably alter the picture of persistence at the top (44.4 percent instead of 44.1 percent attaining the top wealth quintile).

Table 3. Intergenerational wealth mobility

Net worth quintiles within ages 45–64 (N=1,975)

PARENTAL WEALTH QUINTILE		CHILD'S WEALTH QUINTILE					
		LOWEST [<$800]	QUINTILE 2 [$800–$29K]	QUINTILE 3 [$29K–$108K]	QUINTILE 4 [$108K–$331K]	HIGHEST [≥$331K]	TOTAL
Lowest	[≤$24k]	**35.0**	29.9	17.9	10.8	6.4	100.0
Quintile 2	[$24k–$89k]	26.0	**26.6**	23.5	13.8	10.2	100.0
Quintile 3	[$89k–$195k]	22.2	20.7	**22.2**	22.8	12.2	100.0
Quintile 4	[$195k–$411k]	10.7	14.1	20.4	**27.6**	27.2	100.0
Highest	[≥$412k]	6.3	8.4	16.0	25.2	**44.1**	100.0

Note: Quintile boundaries in 2013 dollars.

with 35 percent of them remaining there (and holding basically no net worth), although not as high as persistence as the top.

Channels of Intergenerational Wealth Transmission

In this final section, we examine the importance of two channels of intergenerational wealth transmission underlying the intergenerational wealth associations: (1) inter-vivos transfers and bequests and (2) educational attainment. As before, we report results for the older age group (aged 45–64), which is particularly important for the assessment of the mediating channels: bequests are received later in life and the asset-building potential of higher education is also most adequately assessed once these individuals had enough time to accumulate assets. The results are descriptive rather than causal, continuing our demographic approach, but they provide suggestive evidence on the relative contributions of different pathways to the intergenerational transmission of advantage.

As shown in the first section of table 4, the amount of gifts (inter-vivos transfers) or inheritances (bequests) over $10,000 received to date explains about one-eighth of the observed intergenerational wealth association (11.9 percent). Considering the overall size of these transfers among those who received them does not explain appreciably more of the association (not shown). The quite limited mediating role of transfers and bequests may raise concerns about limitations in their measurement. For instance, although the panel information used here allows us to track inter-vivos transfers and bequests across the life course, one limitation of the survey item used is that it asks only for transfers of $10,000 or more. We therefore tested two additional

Table 4. Channels of intergenerational wealth transmission

Age 45–64, N=1,975

	PERCENT MEDIATED
Inheritance (total value, inverse hyperbolic sine transformed)	11.9%
Education (highest degree received)	25.9%
Joint consideration	34.4%

Note: Mediation of parent-child rank-rank slope in net worth through child characteristics.

measures of bequests, drawing on separate survey items of inheritances received[6] as well as on indicators of parental death as proxy measures of potential bequests.[7] Neither of these specifications suggested a greater role of inter-vivos transfers and bequests in the intergenerational transmission of wealth. One feasible explanation is that bequests are in fact concentrated at the top of the wealth distribution and the modal impact of parental death is not one of an increase in children's net worth.

Finally, we assess the mediating role of education. Accounting for the child's highest degree received accounts for more than one-fourth of the intergenerational wealth association. The attainment of a college degree alone mediates one-fifth of the association (not shown). Together, education and transfers explain a little more than one-third of the two-generation association in wealth (34.4 percent).

Conclusion

The distribution of family wealth is highly unequal, yet wealth's concentration across generations of the same family lineage has received little scholarly attention. We fill this gap by documenting a substantial degree of rigidity in the wealth distribution. We draw on new data from the PSID (2015) to address the life-cycle bias present in the few existing estimates of intergenerational wealth mobility. We find that intergenerational correlations

6 This indicator separately identifies inheritances received in all PSID waves since 1988 and does so without imposing a lower limit. However, this survey item only captures bequests that occurred during the last year and therefore fails to capture a contiguous period of potential bequest receipt since PSID's switch to biennial interviewing in 1997.

7 The idea is that parental deaths are a necessary condition for a bequest to occur. The PSID confirms the death of its sample members through linkage to the National Death Index. We distinguish whether both parents are recorded to be alive in 2011 (the earliest time we observe offspring wealth), whether one parental death is recorded, or whether two parental deaths are recorded.

in wealth rise across the life course as wealth is accumulated, so that the full extent of intergenerational similarity in wealth comes to light only once we investigate those aged 45 and above, which has not been possible before. Estimates of intergenerational persistence rise by about 20 percent when this older age group is considered, compared to younger adults. Furthermore, unlike prior research, we incorporate the experiences of both parents and children who are net debtors—roughly one-fifth of our second generation. While we replicate a prior estimate of intergenerational wealth elasticity (Charles and Hurst 2003), both issues—the age gradient and the influence of debtors—can only be adequately captured through a different specification of intergenerational association based on rank-rank slopes (Chetty et al. 2014; Mazumder 2015). Our resulting main estimate of the correlation in wealth between parents and their children implies that, on average, a 10 percentile point advantage in parents' wealth position is associated with a 4 percentile point advantage in the child generation. The size of this correlation is quite similar to comparable estimates of intergenerational correlations in income (Mazumder 2015), revealing a similar degree of rigidity in different dimensions of economic well-being. Thus, as for other measures of economic well-being, stark inequality in wealth is not counterbalanced by great intergenerational fluidity in wealth.

Our results are robust across multiple specification checks. When we adjusted family wealth for family size, our results were very similar. Likewise, averaging wealth measures across years to reduce measurement error produced very little change in the estimated associations, reducing concerns that our main results are attenuated by remaining measurement error.

We also document that intergenerational wealth persistence is particularly high at the top of the wealth distribution: 44 percent of children from the highest parental wealth quintile end up in the highest wealth quintiles themselves, and only 30 percent fall into the bottom 60 percent of the wealth distribution.

Lastly, we identified two broad channels through which wealth is transmitted across generations: offspring's educational attainment and the receipt of bequests and large inter-vivos transfers. Our findings indicate that a larger part of the intergenerational transmission of wealth is established through the provision of educational advantage, which typically occurs in early adulthood. Inheritances explain a smaller part of intergenerational wealth correlations. Our results are consistent with Charles and Hurst's (2003) finding that the bulk of the intergenerational correlation in wealth is explained by income similarity rather than transfers.

We reiterate that our analyses of channels of transmission are descriptive. It is possible that, rather than parental wealth causally affecting children's

educational attainment, the prospect of their children going to college may induce parents to save up (a similar logic could be applied to inheritances). We also note that intergenerational wealth persistence cannot be interpreted as indicative of the total degree of inequality in opportunity to attain wealth. The determinants of wealth attainment are manifold. Although a considerable part of them are tied to the wealth of prior generations, there are a host of other characteristics of families and environments that shape wealth attainment. Future research may assess total inequality in wealth opportunities across families by estimating within-family correlations in wealth, e.g., among siblings or cousins (see e.g., Hällsten 2014 for Sweden).

Our description of the intergenerational persistence in wealth provides a comprehensive assessment of an understudied dimension of societal rigidity. Research has begun to identify wealth as an important dimension of particularly large and rapidly increasing inequality. Our results caution that this inequality is bound to be replicated across generations. Given recent increases in wealth inequality, our research leads us to be skeptical of the ability of future generations to share in economic prosperity by overcoming the disadvantages related to their wealth origins.

Still, in particular our analysis of the *channels* of intergenerational wealth transmission carry important policy implications. Bequest and inheritance taxation is one intuitive policy approach to limit the disequalizing impact of direct intergenerational wealth transfers. However, we find that bequests explain only a comparatively small part of the intergenerational wealth correlation. Bequests may provide advantage to those who have already profited from the wealth of their parents long before being bequeathed. To even the playing field for the next generation, policymakers therefore cannot exclusively rely on reforming the taxation of bequests and inheritances but need to pay at least as much attention to the way in which wealth supports early-life investments in the next generation. We have shown that the educational attainment of the following generation is an important pathway through which wealth is maintained across generations. Parental wealth may directly reduce credit constraints to college access (Lovenheim 2011), support a variety of educationally relevant investments in the next generation (Kornrich and Furstenberg 2013), including access to advantages neighborhoods, social, and cultural capital, and it may provide important safety nets for children's educational decisionmaking (Pfeffer and Hällsten 2012).

A number of policy proposals exist to support wealth accumulation among the general population as well as among the most disadvantaged, including increased regulation of the loan industry (e.g., pay-day lenders, student loan providers), publicly guaranteed interest rates on national savings bonds (Atkinson 2015), or incentivized savings, for instance through matched savings

accounts (Sherraden 1991). While even the most disadvantaged may indeed be induced to save (Schreiner and Sherraden 2007), it is questionable whether they will ever be able to accumulate a sufficient stock of wealth early on that will have lasting impacts on their children. More radical policy proposal have instead called for sizable and universal "stakeholder grants" as a public provision to all children (Ackerman, Alstott, and Van Parijs 2005; Allstot and Ackerman 2000; Atkinson 2015). A yet different approach would focus on increasing public rather than private wealth: Publicly provided high-quality education from early childhood through college may be one way to reduce the need for parental wealth to succeed. Of course, both the introduction of universal stakeholder grants and the strengthening of public education rely on substantive, additional public revenue. Perhaps the most controversial wealth policy that can yield such revenue is the taxation of wealth itself (Wolff 1995). ■

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Stepping Stone or Quicksand? The Role of Consumer Debt in the U.S. Geography of Economic Mobility

META BROWN
Federal Reserve Bank of New York

MATTHEW MAZEWSKI
Columbia University

*Brown, Mazewski: Federal Reserve Bank of New York (e-mail: **meta.brown@ny.frb.org**, **matthew.mazewski@columbia.edu**).* *The authors would like to thank Equifax, and Andrew Haughwout, Henry Korytkowski, and conference participants at the Federal Reserve System's 2015 Economic Mobility Conference for valuable comments.*

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Introduction

Debt may enhance economic mobility, supporting otherwise impossible investments in human capital and small business, or it may trap low-income consumers in an inescapable cycle of obligation. Chetty et al. (2014) have provided the profession with a detailed description of the geography of intergenerational mobility in the United States and the economic and social factors correlated with upward mobility at the local level. This paper seeks to understand the role of consumer debt reliance in more and less mobile U.S. communities.

Using the Chetty et al. (2014) commuting zone (CZ)-level mobility measures in conjunction with the Equifax-sourced Federal Reserve Bank of New York (FRBNY) Consumer Credit Panel (CCP),[1] a large, proprietary data set on U.S. consumers' borrowing and creditworthiness over the past 15 years, we investigate the comparative mobility of more and less debt-reliant and more and less creditworthy metropolitan areas. Further, we look at the relationships between local consumers' use of different types of debt products and the region's level of intergenerational mobility. Credit risk scores here function as an additional measure of access to consumer loan products. Our estimates condition on local income variation and the major correlates of mobility identified by Chetty et al. (2014), which include factors such as average commute times and the fraction of single-parent households.

We compare maps of regional variation in credit scores and the ratio of consumer debt to income, both for all individuals and for residents of lower income ZIP codes, with the Chetty et al. (2014) mobility maps, and find that they foreshadow several of our main results. These maps demonstrate that absolute mobility, measured at the commuting zone level by Chetty et al. (2014) as the expected position in the national income distribution roughly 15 years later of a youth whose parents' household income places them at the 25th percentile in the national income distribution in 1996–2000, is highest in the Great Plains, Oklahoma, and Texas. Mobility is moderately high in New England and the West and substantially lower in the South and the Rust Belt.

1 Information on the Consumer Credit Panel can be found on the Federal Reserve Bank of New York's website at **www.newyorkfed.org/microeconomics/ccp.html**.

A map of the median credit risk score among lower-income households by commuting zone, using CCP data from the year 2000, is surprisingly similar. Credit risk scores overall, and among residents of lower-income communities in particular, are lowest in the Southeast and much of the Rust Belt, and highest in the Great Plains.[2] Both in general and in low-income communities, credit risk scores in New England and the Pacific Northwest are fairly high.

The remainder of the paper examines whether, and to what extent, the addition of debt characteristics enhances our understanding of mobility once one conditions on the leading mobility correlates identified by Chetty et al. (2014). The theoretical relationship between parents' debt and their children's realized household income is ambiguous. One conceptualization of the problem involves distinguishing credit access from the effect of the burden of debt. A family with more access to credit is more able to take advantage of investment opportunities, including investment in a child's human capital and entrepreneurial investment. In addition, the family may be more able to smooth transient income and health shocks, which may influence children's human capital attainment and overall productivity. At the same time, some have argued that bounded rationality among borrowers, in combination with exploitative lending contracts, can lead to borrowing that exceeds the optimum for the household and to debt burdens that narrow a family's opportunities.[3] Therefore, we seek measures of consumers' debt behavior that help us to separate the role of credit access from that of debt burden.

We estimate the dependence of children's mobility by 2011–12 on debt characteristics of the household in 2000, along with the correlates of mobility identified by Chetty et al. (2014) and measures of the local economic climate. To understand the role of credit access, we estimate the dependence of mobility on the mean credit risk score of residents of lower income ZIP codes in each CZ. It is worth noting that an individual's credit risk score in 2000 contains not only information on forward-looking credit access, but also evidence of the size and amount of unexpected shocks to employment, household structure, health, and investment returns that the individual has experienced over the past several years. Hence the estimated association between credit risk score and mobility is far from causal. However, it may be the cleanest description of the relationship between access to consumer credit and mobility available to us at this point.

We also estimate the relationship between realized mobility by 2011–12 and the prevalence in 2000 of overall debt, and of various categories of consumer debt, among residents of lower income ZIP codes in each CZ. Further, we

2 We define lower income communities as ZIP codes in which the mean household income, using IRS data described below, is below the median average ZIP code-level income among all (measured) U.S. ZIP codes.

3 See, for example, Sunstein (2006).

estimate its relationship to debt balances, both overall and by category. While the prevalence and size of existing debts among lower-income households each conflate initial debt access and ongoing debt burden, we estimate prevalence and balance coefficients separately based on the belief that the prevalence measures will be more informative regarding the share of the lower income population with no access to credit, though this group may be contaminated with those who prefer not to borrow. Similarly, debt balance coefficients may be comparatively informative regarding the relationship of the burden of debt repayment to mobility, despite the fact that balances reflect the supply-demand equilibrium in the consumer debt market, and lower balances may therefore constitute evidence not merely of lower repayment burdens but also of more limited credit access. Throughout the paper, we note instances in which coefficients are and are not sensitive to estimation using only debt balances, or only debt prevalence.

Controlling for the average balances of various types of consumer debt in each CZ, and for the Chetty et al. (2014) mobility correlates discussed below, we find economically large and statistically significant positive associations between a region's past student loan, credit card, and other debt prevalence, particularly among lower-income ZIP codes, and the realized income position by 2011–12 of a child of parents in the region with income at the 25th percentile of the national income distribution in 1996–2000.

Hence, the use of unsecured credit shows a meaningful positive association with both absolute and relative mobility. However, the estimated relationship between mobility and the prevalence of secured debts, such as auto, home equity, and mortgage debt, is either negative or mixed. Summing all consumer debts, we find that the total consumer debt burden of a region is weakly negatively associated with absolute intergenerational income mobility. Finally, conditioning on the above, as well as on income and the Chetty et al. (2014) measures, we find that the mean risk score among residents of lower income ZIP codes in the CZ is strongly (positively) correlated with realized absolute and relative mobility for their children. A standard deviation increase in mean risk score is associated with roughly a 0.2 standard deviation increase in realized absolute mobility. This substantial positive association between risk score and intergenerational income mobility is robust to a wide array of specifications and therefore does not appear to be mediated by either local income or by the Chetty et al. (2014) leading correlates of mobility.

Though not causal, these estimates suggest that more mobile areas are characterized by more prevalent student and credit card debt use, which certainly funds education and may fund small business expenses and parents' expenditures for children. On the other hand, less mobile metropolitan areas are characterized by greater mortgage, home equity, and auto balances, which are likely used to fund housing and auto purchases. On net, debt reliance has a somewhat

ambiguous relationship to local economic mobility; rather, it appears that the types of consumer borrowing, and so perhaps the uses of borrowed funds, play a more meaningful role in intergenerational income mobility. Most importantly, the risk scores and debt prevalence of lower-income households are the debt measures we find to be most closely tied to economic mobility.

It is worth noting that the quality of these findings is entirely contingent on the quality of the Chetty et al. (2014) mobility measures. Based on PSID estimates, Mazumder (2015) argues that the Chetty et al. (2014) relative mobility measure is biased downward as a result of the comparatively short observation window they have available for their vast IRS sample of American families. To the extent that the downward bias that may result from a shorter window of observation is similar across commuting zones, our estimated coefficients should simply reflect somewhat weaker associations between debt or creditworthiness and economic mobility than is actually the case. To the extent that the importance of later-career achievement to realized economic mobility varies from community to community, however, the measurement over a shorter period of time may be pertinent not just to our quantitative but also to our qualitative findings.

The paper proceeds as follows. "Literature" provides an overview of the relevant literature, and notes crucial features of the Chetty et al. (2014) geography of mobility study on which we build, and of the mobility dataset that they have made public. In "Data," we describe the Equifax-sourced FRBNY CCP, both in general and as employed in this study, and we detail additional data sources that describe features of U.S. commuting zones not measured by the CCP. "Geographic Patterns in Debt, Creditworthiness, and Mobility" uses a series of maps to illustrate geographic patterns in consumer debt-to-income (DTI) ratios and measured creditworthiness in 2000 and relates them to geographic patterns in mobility between 1996–2000 and 2011–12, as reported by Chetty et al. (2014). It also lays out a simple empirical model of the relationship between commuting zone debt and other characteristics and realized mobility. "Debt and Other Correlates of Economic Mobility" reports estimates generated by the model, and "Conclusion" offers concluding thoughts.

Literature

The State of the Literature on Intergenerational Mobility and Its Relationship to Credit Access

The literature on intergenerational mobility is extensive. Reviews by Solon (2004) and Black and Devereux (2011) offer helpful summaries of important theoretical and empirical work in this area. In considering the relationship

between student debt and mobility, our analysis contributes to a sizable body of work on the parental decision to invest in a child's human capital, formal modeling of which can be traced to Becker and Tomes (1979; 1986) and more recent studies of which include Han and Mulligan (2001), Grawe and Mulligan (2002), and Grawe (2004). Solon (2004) considers families who may face both life-cycle and intergenerational credit constraints, and hence underinvest in the human capital of their children. Though the model predicts that the intergenerational elasticity of earnings (IGE) should be greater for those who are credit-constrained, previous empirical attempts to estimate the IGE for this group have been thwarted by the difficulty of credibly identifying individuals who face credit constraints. In this context, our ability to observe the credit constraints of parents, and their relationship to the economic positions of their children around age 30, may help to shed light on Solon's predictions for the relationship of young families' access to credit to the life prospects of their children.

Another branch of the literature on intergenerational mobility relates early life experiences to adult income. Palloni (2006) estimates a substantial dependence of adult socioeconomic achievement on early childhood health. Case and Paxson (2010) also find that childhood health problems prevent poor children from realizing economic success, and Currie and Goodman (2010) conclude that there is evidence for links between both parental socioeconomic status and child health, and child health and future educational attainment. To the extent that the effects of childhood health problems on adult outcomes are mediated by access to credit, either to purchase better care or to replace temporary earnings losses so that parents can care for children, we may expect the parents' access to, and observed use of, credit to have meaningful positive effects on mobility for the subset of children who experience adverse health conditions.

Finally, the recent literature on economic mobility has addressed the relationship of several elements of parents' balance sheets to children's adult incomes. Mazumder (2011) argues that low levels of wealth among black parents, arising from a variety of persistent social and economic factors, limit the upward mobility of their children. Hanushek, Leung, and Yilmaz (2014) note that, relative to merit aid schemes, need-based aid for higher education has a greater (negative) impact on the intergenerational transmission of inequality. Bleemer, Brown, Lee, and van der Klaauw (2014) estimate a substantial decline in financial independence from parents in state-cohort groups that are more reliant on student debt. To the extent that student debt is concentrated among the children of lower-middle income families, this delayed independence may indicate a negative relationship between student debt and economic success for such children. Moreover, Chetty et al. (2015) find that areas with mortgage interest deductions that are larger as a share of local income see

higher rates of economic mobility. This would seem to suggest that mortgage debt itself hampers economic mobility, though such inferences would require a more serious treatment of the influence of mortgage interest deductions on house prices than our speculation here offers.

In this context, the present study makes several unique contributions. First, we consider the relationship between intergenerational income mobility and the full set of standard consumer debt types, and not merely student debt, which has been the dominant focus of most previous work on debt and mobility. We are able to describe the relative strength of the conditional correlation between children's realized mobility and their parents' reliance on mortgage, credit card, auto, and student debt, for example. In addition, our credit score data allow us to proxy for access to credit among lower-income households in a commuting zone, which in turn allows us to consider the effect of credit access on mobility more directly than previous work. And lastly, by building on the work of Chetty et al. (2014), we can rule out a number of alternative explanations for a statistical relationship between debt and mobility by showing that the estimated conditional correlations between mobility and credit risk scores and use remain sound even after controlling for those covariates that Chetty and coauthors find to be most strongly associated with mobility.

Chetty, Hendren, Kline, and Saez (2014) Mobility Dataset and Central Findings

The primary contribution of Chetty et al. (2014) is the construction of a dataset of intergenerational economic mobility measures specific to several hundred U.S. communities, or "commuting zones," using IRS income tax records on more than 40 million children and their parents. Parents' characteristics, including location in the U.S. family income distribution, are measured between 1996 and 2000, when the children are aged 15 to 20. Children's adult incomes are measured in 2011 and 2012, when they are roughly 30 years old.

At the national level, they find that a 10 percentile increase in parent income in 1996–2000 is associated with a 3.4 percentile increase in a child's realized income by 2011–12. Further, Chetty et al. (2014) show that intergenerational mobility varies widely from community to community. While the probability of a child born to first income quintile parents reaching the fifth income quintile herself is 4.4 percent in Charlotte, for example, it is 12.9 percent in San Jose.

Most relevant to this study, they explore a number of commuting zone characteristics to determine which are most strongly correlated with measured economic mobility. Candidate characteristics include the degree of residential segregation, the level of income inequality in the 1996–2000 period, school

quality, social capital, and family stability. Measures that they find to be most strongly associated with mobility include average commuting time (a measure relevant to economic segregation), the high school dropout rate, share of children being raised by single mothers, and prior measures of social capital.

Adopting the Chetty et al. (2014) measures of economic mobility at the commuting zone level, we first examine the relationship between geographic debt and credit access patterns and geographic income mobility patterns. The comparison is accomplished first using U.S. maps depicting mobility, credit access, and debt obligations by region, and second through estimates of the simple and conditional correlations of debt and mobility measures. Finally, we control for the five leading correlates of mobility from Chetty et al. (2014), and we investigate the robustness of our measured debt-mobility relationships to their inclusion in the empirical model.

Data

The FRBNY Consumer Credit Panel

The FRBNY CCP is a longitudinal dataset on consumer liabilities and repayment. It is built from quarterly consumer credit report data collected and provided by Equifax Inc. Data are collected quarterly from 1999:Q1, and the panel is ongoing. Sample members have Social Security numbers ending in one of five arbitrarily selected pairs of digits (for example, 10, 30, 50, 70, or 90), which are assigned randomly within the set of Social Security number holders. Therefore the sample comprises 5 percent of U.S. individuals with credit reports (and Social Security numbers). The CCP sample design automatically refreshes the panel by including all new reports with Social Security numbers ending in the above-mentioned digit pairs. Therefore the panel remains representative for any given quarter, and includes both representative attrition, as the deceased and emigrants leave the sample, as well as representative entry of new consumers, as young borrowers and immigrants enter the sample.[4] In addition to the debt, repayment, creditworthiness, and limited demographic characteristics available in a credit file, the dataset contains geographic information down to the census block, allowing us, for the purposes of this study, to tie credit bureau information to mobility, income, and other relevant factors at the commuting zone level and below.

In sum, the CCP permits unique insight into the question at hand as a result of the size, representativeness, frequency, and recentness of the dataset. Its sampling scheme allows extrapolation to national aggregates and spares us

4 See Lee and van der Klaauw (2010) for details on the sample design.

most concerns regarding attrition and representativeness over the course of a long panel.

While the sample is representative only of those individuals with Equifax credit reports, the coverage of credit reports (that is, the share of individuals with at least one type of loan or account) is fairly complete for American adults. Aggregates extrapolated from the data match those based on the American Community Survey, Flow of Funds Accounts of the United States, and the Survey of Consumer Finances (SCF).[5]

Since our analysis is purely cross-sectional, we consider only 2000:Q4 when constructing our commuting zone-level measures of mortgage, home-equity line of credit (HELOC), auto, credit card, and other debt. For measures of student loan debt, we use data from 2004:Q4 because of concerns about the reliability of the relevant CCP variables in earlier years.[6]

For each debt type, as well as for total debt, we consider two metrics: average balance per borrower with debt in each category, and share of CCP individuals with debt in each category.[7] The latter allows us to consider how prevalent the use of certain debt products is, which reflects, in some combination, the share of the population that has access to the type of debt and the share that demands the type of debt. More broadly construed, it reflects the degree of relevance of a given debt category to the broader population.

Other Data Sources

We are interested in determining whether the associations between debt and mobility that we identify include some independent relationship of debt to mobility once one accounts both for the role of the affluence of the

5 Lee and van der Klaauw (2010) extrapolate similar populations of U.S. residents aged 18 and over using the CCP and the American Community Survey, suggesting that the vast majority of U.S. individuals at younger ages have credit reports. Jacob and Schneider (2006) find that 10 percent of U.S. adults had no credit reports in 2006, and Brown et al. (2013) estimate that 8.33 percent of the (representative) SCF households in 2007 include no member with a credit report. See Lee and van der Klaauw and Brown et al. for further details.

6 Reporting incentives for student lenders and servicers before 2004 were consistent with partial coverage of the market by credit bureaus. For this reason, the principal investigators of the CCP have recommended relying on CCP student debt measures from 2004 forward. The later date of measurement may mean that the student debt we observe measures some combination of the youths' childhood circumstances and early realizations of economic mobility. To the extent that this concern clouds interpretation of our results, one can focus instead on the debts measured in 2000.

7 We measure prevalence as the fraction of borrowers in our dataset for 2000:Q4 that have a nonzero balance of a given debt product, and then multiply this number by 100 in order to interpret our later regression coefficients as the effect of a one percentage-point change in prevalence.

community and for the leading mobility correlates described by Chetty et al. (2014). They find the following five factors to be most strongly correlated with mobility: (1) availability of employment (as measured by the fraction of individuals who commute less than fifteen minutes to work); (2) income inequality (as measured by the Gini coefficient of the bottom 99 percent); (3) school quality (as measured by the high school dropout rate); (4) social capital (as measured by an index from Putnam 1995); and (5) family structure (as measured by the fraction of children with single parents); Chetty et al. (2014) have made their mobility data publicly available.[8] Throughout the paper, wherever we make mention of a mobility measure or of the five primary determinants of mobility identified by Chetty et al. (2014), we are relying on their data as posted at the noted site. After looking at simple regressions of mobility on our preferred debt measures, we consider whether the estimated debt effects are robust to inclusion of the covariates.

Following Chetty et al. (2014) further, we adopt the commuting zone as our level of geographic analysis. A CZ is the collection of counties that share a common labor market. It is somewhat analogous to the metropolitan statistical area (MSA) but can also be defined for more rural areas, widening the scope of our geographic analysis beyond urban centers.

Their preferred measure of mobility, which they term "absolute mobility" and which terminology we adopt as well, is the average percentile in the national income distribution in 2011–12 of children whose household income placed them at the 25th percentile of the 1996–2000 U.S. national income distribution. The children are aged 15–20 in 1996–2000, and are therefore around 30 by the time their income position is determined in 2011–12. Note that children's 2011–12 mobility realizations are included in the CZ in which their parents resided in 1996–2000, whether they stayed in that CZ in adulthood or moved across the country.

While the absolute mobility measure is informative regarding the prospects of a youth from a given CZ at a national level, it is less informative regarding movement within the income distribution of the CZ itself. For example, a city that realizes substantial productivity gains relative to the nation may have youth from lower-income households whose position in the national income distribution reflects extensive mobility, and yet that youth may experience no relative gains within her own community. To address mobility within the local income distribution, Chetty et al. (2014) also create a measure of "relative mobility," which relies on the "rank-rank slope" correlation coefficient first studied by Dahl and DeLeire (2008). Here suppose

8 As of the writing, their data and documentation are available at **http://www.equality-of-opportunity.org/**.

R_i is child i's percentile rank in the children's income distribution, and P_i is the parent's percentile rank in the parents' income distribution. Regressing the child's percentile rank on the parent's percentile rank yields a regression coefficient

$$\rho_{PR} = Corr(P_i, R_i),$$

which others have labeled the rank-rank slope. This correlation serves as a measure of the strength of the association between the child's and the parent's position in their respective income distributions. When calculated at the commuting zone level, it gives us a picture of how mobile members of the commuting zone are, accounting for the degree of progress of the children of both low- and high-income parents. As mentioned earlier, important questions about the reliability of these rank-rank estimates have recently been raised by Mazumder (2015), who argues using samples drawn from the PSID that the short time frames over which Chetty and coauthors are able to observe both parent and child income may be a source of considerable downward bias in both these estimates and estimates of the IGE. This work also suggests that the problem appears to be less severe for the rank-rank coefficient than for the IGE, which we do not make use of here. We also run several specifications that feature controls for mean adjusted gross income (AGI), which we compute from ZIP code-level Internal Revenue Service data on aggregate AGI and the number of tax returns filed.[9]

Table 1 summarizes the CZ-level mobility measures provided by Chetty et al. (2014). We see that, on average across commuting zones, the expected adult income percentile rank of a child whose parents' income stood at the 25th percentile is 43.94. Hence we observe substantial, but not perfect, regression to the mean. The average of the estimated within-CZ rank-rank slopes, denoting the degree of correlation in parent and child income percentiles, is 0.33. Perhaps more importantly, each mobility measure displays substantial heterogeneity across commuting zones. The standard deviation of the CZ-level expected percentile rank of a child of the 25th percentile is 5.68 percentile points, suggesting quite a high degree of variability across localities in the expected attainment of lower income children. The standard deviation of the CZ-level parent-child income percentile correlation is 0.07, which, on a base of 0.33, again indicates wide variation in mobility across U.S. communities.

Table 2 provides summary statistics for commuting zone-level debt measures. The debt prevalences and unconditional mean balances are reasonably

9 These data are available on the IRS Statistics of Income (SOI) website at **www.irs.gov/uac/SOI-Tax-Stats-Individual-Income-Tax-Statistics-ZIP-Code-Data-(SOI)**.

Table 1: Summary statistics of mobility measures

MOBILITY MEASURE	MEAN	STANDARD DEVIATION
Absolute upward mobility	43.94	5.68
Relative mobility	0.33	0.07
Probability of moving from the bottom to the top quintile	0.10	0.05

Source: Federal Reserve Bank of New York Consumer Credit Panel/Equifax; Chetty, Hendren, Kline, and Saez (2014).

Table 2: Summary statistics of debt measures

DEBT TYPE	MEAN BALANCE		PREVALENCE	
	MEAN	STD. DEVIATION	MEAN	STD. DEVIATION
Total non-student	$22,967.65	$8,808.74	0.79	0.03
Mortgage	$41,439.93	$16,160.66	0.24	0.08
Home equity	$14,849.42	$8,469.85	0.02	0.02
Auto	$9,009.55	$1,488.81	0.24	0.05
Credit card	$4,004.37	$668.50	0.62	0.06
Student loan	$13,256.33	$4,938.42	0.08	0.04
Other	$5,728.45	$2,305.30	0.47	0.06

Source: Federal Reserve Bank of New York Consumer Credit Panel/Equifax.

consistent with what we would expect for the year 2000, based on studies of the CCP, the Survey of Consumer Finances, and other sources.[10] Note that both home equity and student debt reliance was substantially lower in 2000 than it is today. Further, the equal weighting of commuting zones in these sample averages leads to an under-weighting, relative to population-weighted studies, in debts that are more prevalent in urban areas. This also lowers the measured prevalence and unconditional means we observe in the sample for student and home-equity-based debt.

As with the mobility measures, CZ-level debt reliance, overall and by debt type, is highly variable. The standard deviation of mean debt across commuting zones is $8,808.74, the prevalence of mortgages at the CZ level shows a standard deviation of 7.79 percentage points, and the prevalence of credit card borrowing across CZs has a standard deviation of 6.4 percentage points.

10 See, for example, Bricker et al. (2012) and Brown et al. (2013).

Geographic Patterns in Debt, Creditworthiness, and Mobility

As noted above, maps of geographic variation in the Chetty et al. (2014) mobility measures and in several of the indicators pertaining to consumer indebtedness are helpful in motivating our key findings. Figures 1–3 show how absolute upward mobility, relative mobility, and the probability of moving from the bottom to the top quintile of the national income distribution differ across regions of the United States.[11] Naturally, absolute mobility and the probability of moving to the top quintile exhibit similar patterns: Mobility according to these measures is highest in the Upper Midwest and Great Plains regions and lowest in the Southeast and the Rust Belt, while falling somewhere in between in most areas in the Northeast and along the West Coast.

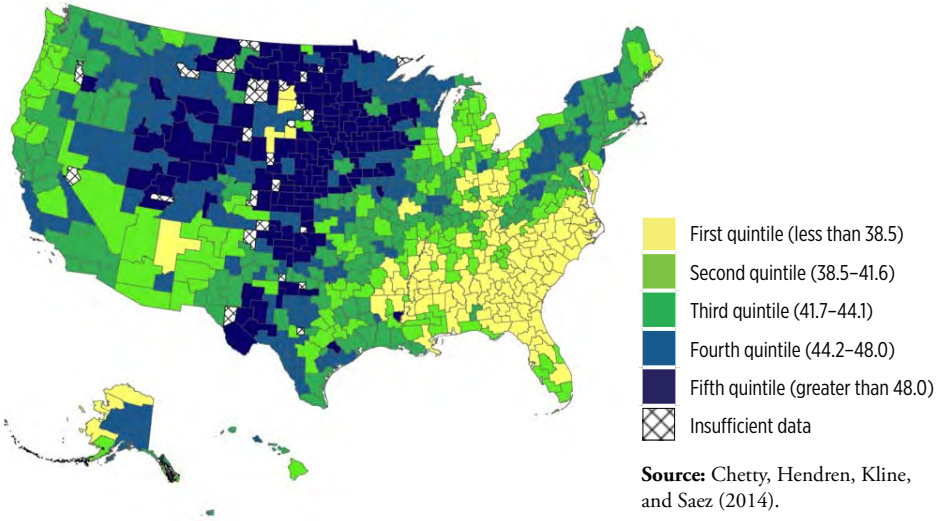
With regard to relative mobility, lower values of the Chetty et al. (2014) index reflect higher levels of relative income mobility for children of the commuting zone. While relative mobility, like absolute mobility, is weakest in the Southeast and the Rust Belt, the West Coast and Upper Midwest seem to dominate even much of the Northeast and New England. And perhaps somewhat surprisingly, relative mobility actually seems quite strong in pockets of Appalachia, which lags behind in terms of absolute mobility. The modest differences in these patterns are a further reminder that there is no *a priori* reason why a particular variable should be related to different measures of mobility in the same way or with the same sign.

Figures 4 and 5 show variation at the commuting zone level in the mean Equifax risk score and the mean risk score for ZIP codes with an average AGI in the bottom half of the national distribution. (For figure 5, we retain the quintile cutoffs used in figure 4 to facilitate comparison of the two.) The results are striking: While average risk scores are consistently high across the Upper Midwest for both all borrowers and borrowers in low-income ZIP codes, they tend to fall into the bottom quintile in low-income ZIP codes across the entire southern half of the country. Also of note is the fact that the lowest risk scores are found in states such as Louisiana, Alabama, Mississippi, Georgia, and South Carolina, which also exhibited the lowest levels of absolute and relative mobility.

Finally, figures 6 and 7 present debt-to-income ratios for both all ZIP codes and those in the bottom half of the national distribution by mean AGI, respectively. The numerator is aggregate debt as measured from the CCP and the denominator is aggregate AGI, which is taken from the Internal Revenue

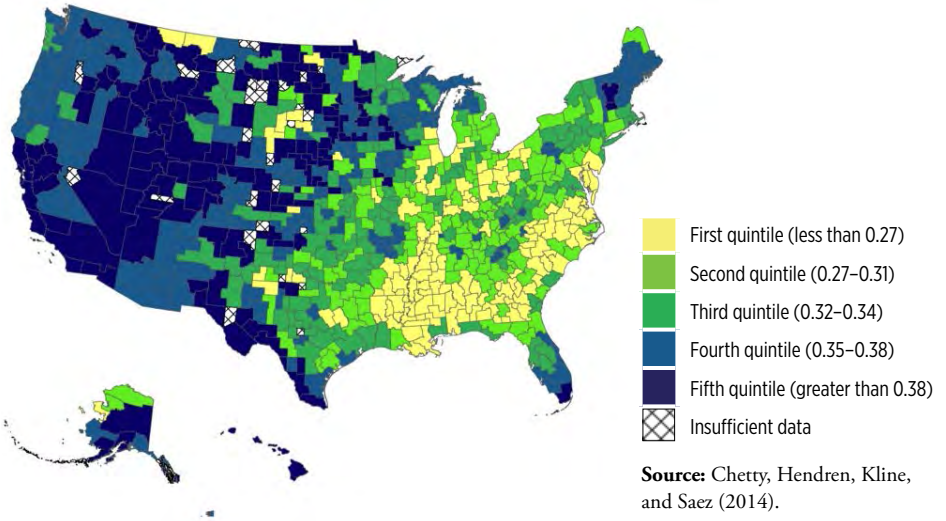
11 Figures 1 and 2 are based on figures VI(A) and VI(B) from Chetty et al. (2014).

Figure 1. Absolute upward mobility



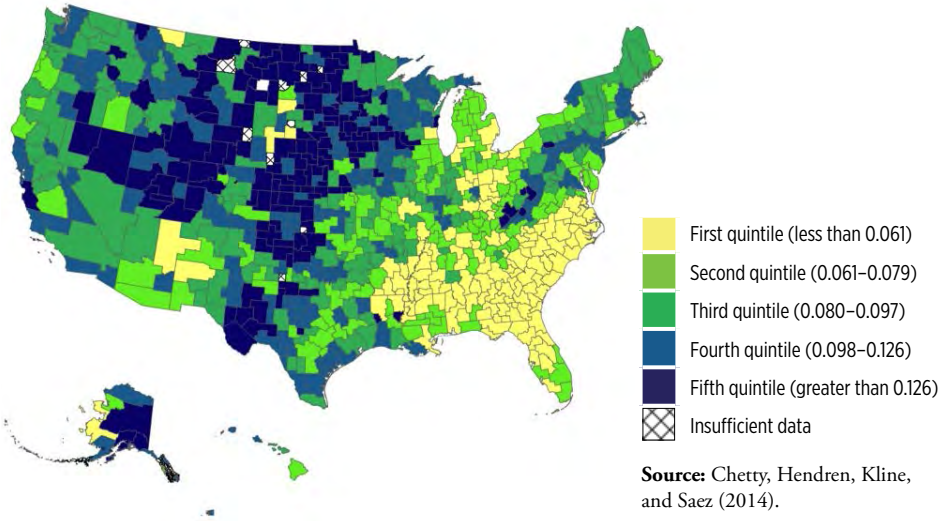
Source: Chetty, Hendren, Kline, and Saez (2014).

Figure 2. Relative mobility



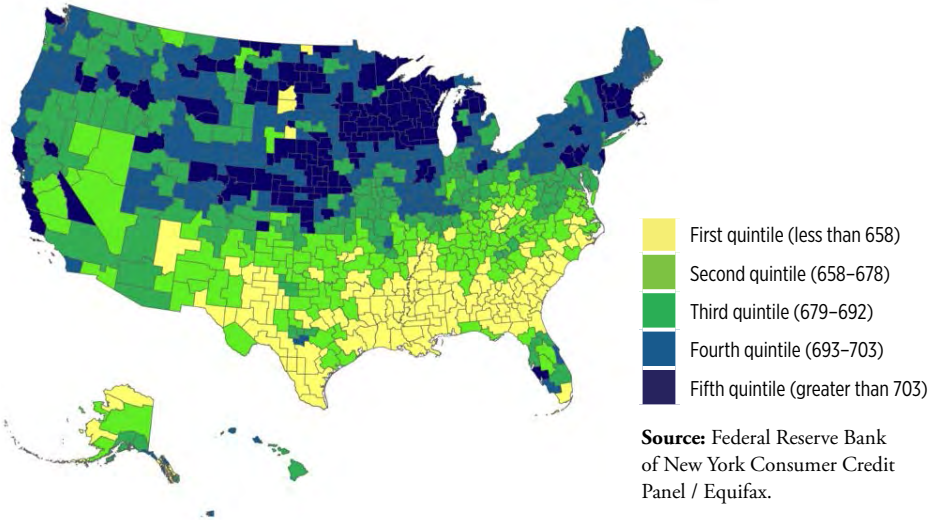
Source: Chetty, Hendren, Kline, and Saez (2014).

Figure 3. Probability of moving from the bottom to top quintile



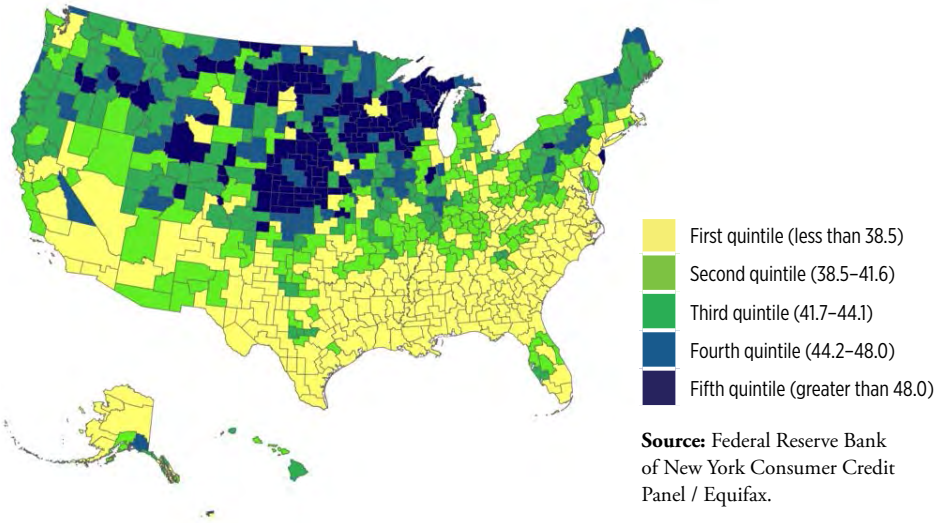
Source: Chetty, Hendren, Kline, and Saez (2014).

Figure 4. Mean risk score (all ZIP codes)



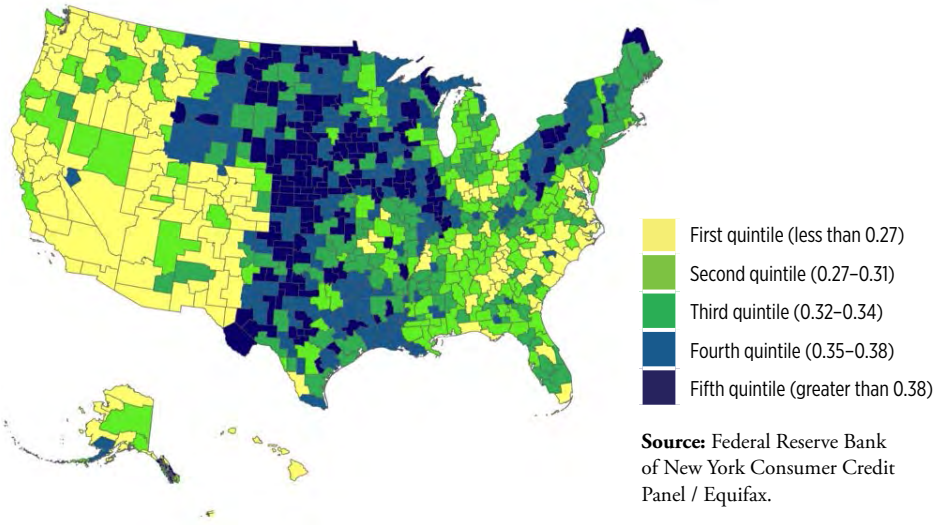
Source: Federal Reserve Bank of New York Consumer Credit Panel / Equifax.

Figure 5. Mean risk score (ZIP codes with mean AGI below national median only)



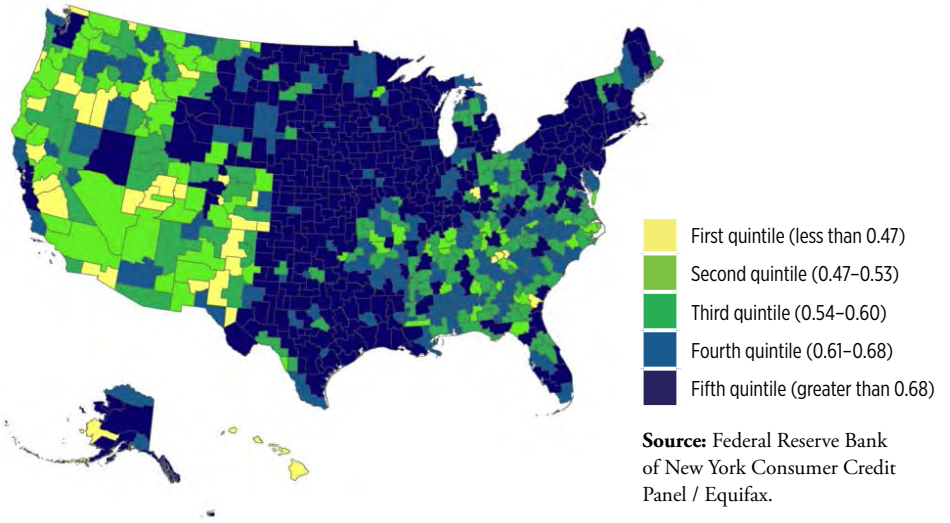
Source: Federal Reserve Bank of New York Consumer Credit Panel / Equifax.

Figure 6. Debt-to-income ratio (all ZIP codes)



Source: Federal Reserve Bank of New York Consumer Credit Panel / Equifax.

Figure 7. Debt-to-income ratio (ZIP codes with mean AGI in the bottom half of the national distribution only)



Source: Federal Reserve Bank of New York Consumer Credit Panel / Equifax.

Service Statistics of Income (SOI).[12] (We again use the same cutoffs in both maps for ease of comparison.) Here we see that debt-to-income ratios are highest in the West and parts of the Southeast, with the same pattern holding in a less pronounced form for the subsets of each commuting zone consisting of the low-income ZIP codes. The major difference between the risk score and mobility maps is in the Southwest, where scores are low but mobility moderately high. While low debt-to-income areas, such as the Plains, Oklahoma, and New England, are largely high mobility and high credit risk score areas, the Southwest is unusual. It is characterized by very high DTI, low risk scores, and yet high income mobility. Texas is peculiar for its low DTI and high mobility, and yet low credit risk scores. In sum, more mobile areas often are also areas characterized by better debt conditions for the poor, in terms of both low DTI and high risk scores, but notable exceptions exist.

Although the mobility measures and consumer debt variables do not perfectly covary, a brief inspection of these maps can provide a rough sense of the relationship between them. Both absolute mobility and mean risk scores are highest in the Upper Midwest, while mobility and risk scores are lowest

12 This numerator includes all standard debt types except student debt, as sufficiently reliable student debt measures are not available in our data for 2000.

in the Southeast. Consumer debt as a share of income also seems to be lowest in those parts of the country with the greatest degree of both absolute and relative mobility.

Our simple empirical approach involves estimating

$$M_z = X_z\beta^C + D_z\beta^D + \varepsilon_z,$$

using ordinary least squares. Here z indexes the commuting zone, vector X contains the Chetty et al. (2014) determinants of mobility and any income measures for z that may be included in the specification, and D is the vector of debt measures drawn from the CCP that are included in the estimation. We impose no geographic correlation structure on the error.

Debt and Other Correlates of Economic Mobility

Correlation of Mobility with the Chetty et al. Mobility Determinants

We begin by reviewing the relationship between economic mobility and the five local factors identified by Chetty et al. (2014) to be most closely correlated with mobility. This serves to illustrate the nature of the geographic variation in economic mobility evident in their data. Given these relationships, we will be able to examine not only the additional variation in mobility that is explained by the commuting zone's debt characteristics, but we will also be able to report the degree of robustness of these mobility correlates to the inclusion of a range of debt measures.

Chetty et al. (2014) report coefficients on the five correlates in terms of standard deviations in the regressors. Because of the widely varying units of measure across the various leading correlates of mobility, this allows some degree of comparability across the estimated mobility associations with, for example, rates of high school graduation or single parenting, and the level of social trust. In reporting our debt estimates, we follow suit wherever reasonable. This yields some ease of comparison of debt dollars, risk score points, and, for example, levels of social trust.

Table 3 reports our replication of table 6 in Chetty et al. (2014), which contains OLS estimates of the conditional correlation between mobility and the five leading correlates. Here we see that a one standard deviation increase in the fraction of commuting zone residents with a short commute is associated with a 0.3 standard deviation in absolute upward mobility. This estimate is highly significant, and is robust to estimation including state fixed effects or using only

Table 3: Correlates of intergenerational mobility

DEPENDENT VARIABLE	ABS. UPWARD MOBILITY			REL. MOBILITY		PR. Q1-Q5
	(1)	(2)	(3)	(4)	(5)	(6)
Fraction short commute	0.302***	0.227***	0.314***	-0.290***	-0.277***	0.017***
	(0.07)	(0.08)	(0.05)	(0.06)	(0.06)	(0.00)
Gini bottom 99%	-0.009	-0.017	0.06	0.006	-0.142	-0.002
	(0.05)	(0.04)	(0.10)	(0.07)	(0.09)	(0.00)
High school dropout rate	-0.147**	-0.120***	-0.109	0.01	-0.006	-0.005
	(0.06)	(0.04)	(0.09)	(0.06)	(0.08)	(0.00)
Social capital index	0.169***	0.065	0.173***	0.154**	0.232***	0.002
	(0.05)	(0.05)	(0.06)	(0.06)	(0.09)	(0.00)
Fraction single mothers	-0.487***	-0.477***	-0.555***	0.591***	0.687***	-0.022***
	(0.06)	(0.07)	(0.09)	(0.05)	(0.09)	(0.00)
State FEs		X				
MSAs only			X		X	
Observations	709	709	325	709	325	709
R-squared	0.76	0.86	0.67	0.48	0.47	0.60

Note: *, **, and *** denote significance at the 10, 5, and 1 percent levels, respectively. Standard errors, shown in parentheses, are clustered at the state level.
Source: Chetty, Hendren, Kline, and Saez (2014).

urban commuting zones.[13] A one standard deviation decline in the high school dropout rate increases absolute mobility by 0.15 standard deviations, and this is significant and robust to estimating with state fixed effects, but precision is lost when estimating among only commuting zones that intersect with MSAs.[14] A one standard deviation increase in social capital is associated with a 0.17 standard deviation increase in mobility, and much of this estimated effect arises from cross-state variation. The measure that shows the highest degree of correlation with mobility is the fraction of single mothers. A one standard deviation increase in the fraction of children being raised by single mothers is associated with roughly a 0.5 standard deviation decline in absolute mobility, and this estimate is highly significant and robust to all of the specification changes described above.

Estimated effects of the Chetty et al. (2014) five on absolute and relative mobility uncover revealing relationships. Shorter commuting distances

13 By "urban commuting zones," we mean commuting zones that intersect with metropolitan statistical areas.

14 The magnitude of the point estimate remains comparable.

and lower rates of single parenting are associated with large and significant improvements in both the absolute gains of poor children of the commuting zone relative to the rest of the country and, within the commuting zone, the relative progress of children of the poor when compared with children of the rich in the same locale. The latter is demonstrated by the large and significant coefficients on the commute and single parenting measures in the relative mobility models in columns (4) and (5). Note that a negative coefficient in the relative mobility model indicates a weaker dependence of child income on parent income, and hence more relative mobility among the children of poorer 1996–2000 parents. At the same time, a decrease in the high school dropout rate in the commuting zone is associated with a substantial improvement in absolute mobility for children of poorer parents in the commuting zone, but it not associated with any gains in relative mobility. Perhaps most surprisingly, a one standard deviation increase in the social capital index not only increases absolute upward mobility relative to the United States of children of poorer parents in the commuting zone, but it also weakens their relative mobility. Poorer children in commuting zones characterized by high social capital do an impressive job of catching up with the rest of the country, and yet a much worse job of catching up with their less disadvantaged local peers.

From here, we begin by adding mean risk score among low-income households to the list of regressors. Given the absolute mobility measure, expected income percentile of a child of 25th percentile parents, the debt characteristics of low-income families seem most pertinent. We calculate the mean risk score in each commuting zone *among parents who lived in ZIP codes whose mean income was below the national median in 1998.* In table 4, we estimate the correlation of this low-income risk score with mobility in the pooled sample of commuting zones, conditioning on the Chetty et al. (2014) regressors and IRS CZ income means. We find that a one standard deviation increase in the commuting zone's mean risk score among low-income households is associated with a 0.116 to 0.259 standard deviation increase in absolute mobility. These point estimates are substantial, and their significance and magnitude grow when we include a state fixed effect, or estimate among MSAs only. Further, a one standard deviation increase in risk score among low-income residents is associated with a 0.358 to 0.492 standard deviation decrease in the dependence of child income percentile on parent income percentile, and hence with a noteworthy jump in relative mobility. This is our first evidence of a strong positive correlation between measured creditworthiness and mobility.

Note, of course, that this substantial estimated conditional correlation between risk score and both absolute and relative mobility appears despite controls for local income levels, social capital, inequality, family stability, commuting distances, dropout rates, and state fixed effects (though the relationship

Table 4: Correlates of mobility including creditworthiness

(ZIP codes with below-median average AGI only)

DEPENDENT VARIABLE	ABSOLUTE UPWARD MOBILITY			REL. MOBILITY		PR. Q1-Q5
	(1)	(2)	(3)	(4)	(5)	(6)
Mean risk score	0.116	0.161**	0.259**	-0.358***	-0.492***	0.000
	(0.07)	(0.08)	(0.11)	(0.07)	(0.09)	(0.00)
Controls	X	X	X	X	X	X
State FEs		X				
MSAs only			X		X	
Observations	706	706	324	706	324	706
R-squared	0.76	0.86	0.71	0.52	0.57	0.60

Note: *, **, and *** denote significance at the 10, 5, and 1 percent levels, respectively. Standard errors, shown in parentheses, are clustered at the state level.
Source: Federal Reserve Bank of New York Consumer Credit Panel/Equifax; Chetty, Hendren, Kline, and Saez (2014).

with absolute mobility becomes insignificant for urban areas). The measured relationship between creditworthiness among lower earners and their children's realized mobility evidently has a substantial independent component, which is not mediated by these leading correlates of geographic variation in intergenerational income mobility. To put a finer point on the argument, we observe that the (adjusted) R-squared generated by the Chetty et al. (2014) model is improved, in some cases meaningfully, by the inclusion of risk scores for lower-income residents. The greatest gains in the fit of this simple model appear where the outcome is relative mobility; in the MSA-only relative mobility model, the addition of low-income risk scores increases the adjusted R-squared from the 0.46 generated by the Chetty et al. (2014) top five correlates to 0.56.

But how do debt prevalence and accumulated (and unrepaid) debt balances relate to local mobility? Further, which categories of consumer debt are most closely tied to mobility? We expand vector *D* of CCP debt measures to include the prevalence and mean balance among residents of lower income ZIP codes of mortgage, home-equity-based (HELOC), auto, and credit card debt in 2000, and student debt in 2004, along with their mean risk scores. Table 5 reports the results.[15] We see that the risk score coefficient estimates are robust to the expansion of the debt vector in this way. In fact, inclusion of debt

15 Note that the mean debt balances among residents of lower-income ZIP codes are defined by summing the total debt in the category over all residents in the lower-income ZIP code and dividing by the 18-and-over census population in the ZIP code.

Table 5: Correlates of mobility including creditworthiness, debt balances, and prevalence

(ZIP codes with below-median average AGI only, over-18 census population)

DEPENDENT VARIABLE	ABS. UPWARD MOBILITY			REL. MOBILITY		PR. Q1-Q5
	(1)	(2)	(3)	(4)	(5)	(6)
Mean risk score	0.273***	0.183***	0.371***	-0.325***	-0.442***	0.007**
	(0.063)	(0.048)	(0.097)	(0.063)	(0.075)	(0.003)
Mean mortgage balance	0.118**	-0.076	0.166**	-0.479***	-0.564***	0.010***
	(0.058)	(0.075)	(0.072)	(0.069)	(0.098)	(0.003)
Mortgage prevalence	-0.232***	-0.069	-0.238***	0.228***	0.185*	-0.015***
	(0.065)	(0.048)	(0.071)	(0.075)	(0.097)	(0.004)
Mean HELOC balance	0.036	0.005	-0.074	-0.027	-0.011	-0.001
	(0.051)	(0.034)	(0.077)	(0.051)	(0.073)	(0.003)
HELOC prevalence	-0.142**	-0.073	-0.078	0.119*	0.166**	-0.005
	(0.058)	(0.048)	(0.099)	(0.063)	(0.081)	(0.003)
Mean auto balance	0.095*	0.036	0.149	-0.013	-0.015	0.002
	(0.054)	(0.059)	(0.090)	(0.072)	(0.091)	(0.004)
Auto prevalence	-0.128**	-0.100*	-0.235**	0.018	0.055	-0.002
	(0.057)	(0.050)	(0.088)	(0.077)	(0.109)	(0.005)
Mean credit card balance	-0.080**	-0.024	-0.066	0.031	-0.056	-0.004**
	(0.038)	(0.030)	(0.112)	(0.041)	(0.097)	(0.002)
Credit card prevalence	0.117*	0.103	0.142	-0.103*	0.038	0.007**
	(0.067)	(0.077)	(0.123)	(0.057)	(0.127)	(0.003)
Mean student loan balance	-0.008	-0.013	0.066	0.022	0.006	-0.001
	(0.022)	(0.016)	(0.064)	(0.035)	(0.054)	(0.001)
Student loan prevalence	0.087**	0.032	0.039	-0.105**	-0.047	0.003
	(0.040)	(0.029)	(0.074)	(0.042)	(0.057)	(0.003)
Mean other debt balance	-0.090**	-0.073***	-0.205***	0.071**	0.174**	-0.004*
	(0.036)	(0.019)	(0.056)	(0.033)	(0.073)	(0.002)
Other debt prevalence	0.180***	0.111*	0.269***	0.000	-0.078	0.009***
	(0.058)	(0.061)	(0.082)	(0.056)	(0.112)	(0.003)

TABLE 5 CONTINUED ON NEXT PAGE

TABLE 5 CONTINUED

DEPENDENT VARIABLE	ABS. UPWARD MOBILITY			REL. MOBILITY		PR. Q1-Q5
	(1)	(2)	(3)	(4)	(5)	(6)
Controls	X	X	X	X	X	X
State FEs		X				
MSAs only			X		X	
Observations	705	705	324	705	324	705
R-squared	0.81	0.88	0.79	0.63	0.74	0.65

Note: *, **, and *** denote significance at the 10, 5, and 1 percent levels, respectively. Standard errors, shown in parentheses, are clustered at the state level.
Source: Federal Reserve Bank of New York Consumer Credit Panel/Equifax; Chetty, Hendren, Kline, and Saez (2014).

category means and prevalences actually increases the magnitude and precision of the risk score coefficient in column (1), the specification without state fixed effects and estimating using the full sample.

Next we discuss the debt prevalence and balance estimates that appear in table 5. While our baseline estimates represent the results of estimating expression (1) with an extended vector of debt measures, the reader might note the possibility of a high degree of correlation among some subset of our county-level debt use and credit risk measures, and this might lead to questions regarding the interpretation of coefficient estimates in table 5. In order to give some sense of the interdependence of the coefficient estimates, and the robustness of these particular observed associations to alternative specifications, we add footnotes reporting estimates in which each debt measure is the sole entry in debt vector D in expression (1), though the Chetty et al. (2014) measures are included as before, and comparing these to the table 5 results.

Turning to debt prevalence and balance, we find, surprisingly, that both housing and auto debt prevalence among lower-income families appear to weaken mobility.[16] Note that mortgage, home equity, and auto debt represent the three major types of secured consumer credit. Hence what we observe is a modest negative and significant correlation between debt secured by durable goods or assets held by lower income residents and the level of mobility in a commuting zone. A one standard deviation increase in mortgage prevalence

16 These relationships appear whether we measure auto, mortgage, and home-equity debt as mean debt among all CZ residents or as mean debt among residents of lower-income ZIP codes within the CZ. This result holds whether the housing and auto debts are included in the extended debt vector or are used as the sole county-level debt measure, though in the case of auto debt prevalence the coefficient on the measure when included alone becomes small and insignificant.

among lower income households is associated with a 0.23 standard deviation decrease in absolute mobility. Much of the variation driving this result appears to be at the state level, as adding state fixed effects decreases the magnitude of the coefficient and leads to insignificance. It is, however, just as apparent when estimating only among MSAs. The dollar amount of mortgage balances among low-income residents has a positive but weaker association with absolute mobility. HELOC prevalence is also associated with decreased absolute mobility, if somewhat less strongly.

Turning to relative mobility, again the picture is somewhat mixed. Both mortgage debt and HELOC debt prevalence are modestly but significantly associated with reduced relative mobility.[17] At the same time, we estimate a large and highly significant positive association between mortgage balance among low-income residents of the commuting zone and relative mobility.[18] A one standard deviation climb in low-income mortgage balances is associated with a 0.479 to 0.564 standard deviation drop in the rank-rank slope coefficient, and hence a marked decline in the extent to which a child's realized income depends on her parents' income in that commuting zone. On net, it appears that more prevalent housing debt among lower-income residents of a commuting zone is associated with somewhat less success for a child of the commuting zone in catching up with the rest of the United States, but that higher mortgage balances among lower-income residents of the commuting zone are associated with substantially more success for that child in catching up with her own regional peers.

In the case of auto debt, our third major category of secured consumer debt, we again see a negative, substantial, and significant association between debt prevalence and absolute mobility. A one standard deviation increase in auto debt is associated with a 0.100 to 0.235 standard deviation decline in absolute mobility. However, the coefficients on mean auto balance in the absolute mobility model are small, positive, and insignificant, and the coefficients on all auto debt measures in both relative mobility models are quite small and insignificant.[19] Hence it appears that, on net, auto debt has a weak negative relationship to absolute mobility and no clear relationship to relative mobility. In sum, secured debts, taken together, show a weak negative association with absolute mobility.

17 Unlike the secured debt prevalence results for absolute mobility, these relative mobility results are sensitive to the exclusion of other debt regressors. When included separately, HELOC prevalence has no significant relationship to relative mobility, and mortgage prevalence is actually strongly positively associated with relative mobility.

18 This results holds up whether or not one includes the other debt regressors. Hence we find a strong positive association between all measures of lower-income ZIP codes' mortgage reliance and relative mobility.

19 These results are similar whether auto debt is included alone or with the extended vector of debt measures.

On the other hand, the prevalence of each category of unsecured debt—student debt, credit card debt, and other debt (including consumer finance loans and retail debt)—is associated with greater absolute mobility.[20] A one standard deviation increase in the prevalence of credit card, student, and other debt among low-income residents is associated with, respectively, a 0.117, 0.087, and 0.180 standard deviation increase in absolute mobility.[21] Hence the estimates indicate that, while secured debt among lower-income families such as mortgage, home equity, and auto loans is negatively associated with absolute and, in many cases, relative mobility, participation in unsecured debt markets is associated with significant and substantial increases in mobility. The estimates for the unsecured debt cases are somewhat smaller and less robust, but they are, nevertheless, of economically important magnitude.

Student debt and credit card debt are also modestly and significantly associated with improved relative mobility for children of lower-income residents. On the other hand, other debt shows no meaningful association with relative mobility, and the dollar amounts of other debt are associated with lower absolute and relative mobility for children of low-income parents across the board.[22] The estimates for our three leading categories of unsecured debt suggest that use of unsecured borrowing (and hence some combination of demand for and access to unsecured loans) has a meaningful positive association with mobility, but that higher amounts of such borrowing is associated with more limited mobility, perhaps through the effects of unmanageable debt burden on parents' investments.[23]

20 This is true for credit card and student debt whether one includes the prevalence measure alone or with the extended vector of debt measures. Including other debt prevalence alone, however, leads to small and insignificant absolute mobility coefficients.

21 These point estimates are significant at the 10, 5, and 1 percent levels, respectively.

22 These results, by and large, are the same whether one estimates including each debt measure alone or with the extended vector of debt measures. One exception is the prevalence of student debt, whose estimated association with relative mobility is both significant and very large when estimated in the absence of the other debt measures; a 1 percentage point increase in student debt prevalence is associated with a decrease of 0.122 in the rank-rank slope coefficient.

23 Estimating a model analogous to that represented in table 5 that instead measures risk scores and debt using all CZ residents, instead of residents of low-income ZIP codes, produces surprisingly similar results. Coefficients on risk score and on debt prevalence and balance for auto, mortgage, and other debt are similar in both magnitude and significance. The primary differences that emerge are for the cases of student and credit card debt. There the estimated impact on mobility is similar in direction but stronger in magnitude, significance, or both when we measure debt using all CZ residents. A table of these estimates is available from the authors.

One last insight based on the estimates is that the addition of debt measures improves the fit of the Chetty et al. (2014) mobility models, and does so most effectively for the case of relative mobility. The addition of risk score, income, and debt prevalence and mean among lower-income residents by leading consumer debt categories improves the fit of the Chetty et al. (2014) absolute mobility model based on CZs that intersect MSAs from an adjusted R-squared of 0.66 to one of 0.78; it improves the fit of the MSA-level relative mobility model from 0.46 to 0.72.[24]

Conclusions

This paper extends the rich depiction of the U.S. geography of economic mobility provided by Chetty et al. (2014) to include commuting zone-level relationships between parents' debt profiles in 2000 and their children's realized economic progress by 2011–12. In a series of maps, we render the geography of debt use and creditworthiness as it pertains to the parents in the Chetty et al. (2014) mobility measures. Separate maps describe debt and creditworthiness in lower-income regions, which is, arguably, of particular relevance to economic mobility. Though the debt and mobility measures vary widely, and reflect substantial independent variation, we observe that areas characterized by weak absolute and relative mobility for children of lower-income parents are also, more often than not, characterized by poor risk scores among lower-income ZIP code residents, high debt to income ratios, or some combination of the two.

Estimates of the dependence of absolute and relative mobility on debt prevalence, levels, and low-income risk scores provide several novel insights. Higher risk scores are strongly positively associated with the mobility realized by children of lower-income parents in the commuting zone; commuting zone risk scores offer extensive explanatory power in models of mobility, even when accounting for both income and correlates of local mobility such as average commuting time, social capital, and share of single-parent households. Unsecured debt prevalence within lower income ZIP codes in a region is positively and, in many cases, substantially associated with both absolute and relative mobility. While one must recognize the conflation of evidence regarding credit access and demand for credit represented by the prevalence of unsecured debt in a county, these estimates at least suggest that access to unsecured borrowing, which can be used to smooth consumption and provide support around income, health, and household shocks, may be advantageous in producing labor market productivity in the rising generation. At the same

24 We include a mean income regressor in each of our new specifications. However, its coefficients are generally small and far from significant. Addition of only the income regressor does very little to improve fit.

time, secured debts show either a negative or a mixed association with absolute and relative mobility for children of the commuting zone, suggesting that credit used to finance large purchases may have more mixed consequences for children's attainment.

These estimated relationships are merely correlational, and should therefore be interpreted with caution. Estimating a causal relationship between local debt reliance and creditworthiness and intergenerational mobility occurring over the span of many years would be challenging for a number of reasons. This study exploits the availability of two elaborate panels, each representing millions of U.S. families over the years from 1996 (or 1999) to 2011–12, and each offering fine geographic detail, to reveal debt and economic mobility relationships that reach far beyond what was available in the past. The resulting evidence, while not causal, reveals strong relationships between unsecured debt, secured debt, creditworthiness, and intergenerational mobility that may be used to inform a wide variety of models of parental investment under credit constraints and the economic outcomes realized by their children many years later.

The strength of the relationship estimated in this paper between credit risk scores and intergenerational economic mobility gives rise to an array of questions. For example, what are the relative contributions of the household's prior economic experiences and its forward-looking credit access to this stark observed relationship between parents' measured creditworthiness and their children's outcomes? Policy-induced or other similar variation in access to credit may eventually shed light on the close correlation between current credit conditions and the opportunities available to American children. ■

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Appendix table 1: Correlates of mobility including creditworthiness, debt balances, and prevalence

(ZIP codes with above-median average AGI only, over-18 census population)

DEPENDENT VARIABLE	ABS. UPWARD MOBILITY			REL. MOBILITY		PR. Q1-Q5
	(1)	(2)	(3)	(4)	(5)	(6)
Mean risk score	0.086**	0.070*	0.386***	-0.154**	-0.331***	0.002
	(0.04)	(0.04)	(0.08)	(0.06)	(0.10)	(0.00)
Mean mortgage balance	0.061	-0.098	0.179**	-0.350***	-0.514***	0.008**
	(0.07)	(0.10)	(0.09)	(0.09)	(0.12)	(0.00)
Mortgage prevalence	-0.080*	-0.024	-0.278***	0.106	0.08	-0.005**
	(0.05)	(0.05)	(0.06)	(0.08)	(0.08)	(0.00)
Mean HELOC balance	-0.026	-0.006	0.028	-0.183*	-0.212	0.000
	(0.098)	(0.067)	(0.119)	(0.094)	(0.152)	(0.004)
HELOC prevalence	-0.059	0.033	-0.179	0.303***	0.335**	-0.004
	(0.077)	(0.044)	(0.125)	(0.076)	(0.129)	(0.003)
Mean auto balance	0.211**	0.206**	0.119	-0.066	-0.040	0.013**
	(0.098)	(0.083)	(0.115)	(0.154)	(0.106)	(0.005)
Auto prevalence	-0.151**	-0.158***	-0.141	0.086	0.087	-0.008**
	(0.061)	(0.049)	(0.094)	(0.074)	(0.093)	(0.004)
Mean credit card balance	-0.063**	-0.012	-0.033	0.044	0.002	-0.005***
	(0.028)	(0.022)	(0.092)	(0.081)	(0.112)	(0.001)
Credit card prevalence	0.072	0.044	0.025	-0.142**	-0.055	0.004
	(0.044)	(0.037)	(0.086)	(0.056)	(0.148)	(0.003)
Mean student loan balance	0.027	0.016	-0.097	-0.076*	0.110	-0.001
	(0.028)	(0.020)	(0.061)	(0.044)	(0.069)	(0.002)
Student loan prevalence	0.017	-0.014	0.271***	0.039	-0.171*	0.001
	(0.023)	(0.019)	(0.073)	(0.027)	(0.086)	(0.001)
Mean other debt balance	-0.039	0.016	-0.294***	0.091*	0.211	-0.002
	(0.042)	(0.038)	(0.108)	(0.052)	(0.138)	(0.003)
Other debt prevalence	0.058	0.012	0.276***	0.073	-0.029	0.004
	(0.039)	(0.052)	(0.090)	(0.046)	(0.112)	(0.003)

APPENDIX TABLE 1 CONTINUED ON NEXT PAGE

APPENDIX TABLE 1 CONTINUED

DEPENDENT VARIABLE	ABS. UPWARD MOBILITY			REL. MOBILITY		PR. Q1-Q5
	(1)	(2)	(3)	(4)	(5)	(6)
Controls	X	X	X	X	X	X
State FEs		X				
MSAs only			X		X	
Observations	617	617	320	617	320	617
R-squared	0.78	0.87	0.78	0.61	0.7	0.67

Note: *, **, and *** denote significance at the 10, 5, and 1 percent levels, respectively. Standard errors, shown in parentheses, are clustered at the state level.
Source: Federal Reserve Bank of New York Consumer Credit Panel/Equifax; Chetty, Hendren, Kline, and Saez (2014).

Income Gains and Month-to-Month Income Volatility: Household Evidence from the U.S. Financial Diaries

ANTHONY HANNAGAN
U.S. Financial Diaries

JONATHAN MORDUCH
New York University and U.S. Financial Diaries

*The U.S. Financial Diaries Project (**www.usfinancialdiaries.org**) was designed and implemented by Jonathan Morduch (NYU Wagner, Financial Access Initiative), Rachel Schneider (Center for Financial Services Innovation), and Daryl Collins (Bankable Frontier Associates). Morduch and Schneider are the principal investigators for the ongoing analysis, and this study develops ideas in Jonathan Morduch and Rachel Schneider, "Spikes and Dips: How Income Uncertainty Affects Households" (U.S. Financial Diaries Issue Brief, October 2013). Leadership support for the U.S. Financial Diaries Project is provided by the Ford Foundation and the Citi Foundation, with additional support from the Omidyar Network. We thank Rachel Schneider, Tim Ogden, and Julie Siwicki for valuable input. Contact: Jonathan Morduch—**jonathan.morduch@nyu.edu**.*

Introduction

The dynamics of mobility are shaped by the ups and downs of households' incomes and opportunities. The ups and downs also stand as an independent concern. When asked in a Pew national survey about which they feel is more valuable, 92 percent of respondents opted for financial stability over moving a rung up the income ladder.[1]

While month-to-month financial instability matters to families alongside mobility, the ups and downs are hard to see in typical household surveys; most collect data too infrequently to reveal the ups and downs. Yearly surveys report conditions at a moment in time, but they do not reveal much about what happens between surveys. Even with a longitudinal household survey, noisy data impedes attempts to accurately measure volatility, particularly for low-income households (Dynan et al. 2012).

Recognizing the need for a different approach, the U.S. Financial Diaries (USFD) project was designed to capture high-frequency financial volatility faced by working Americans (Morduch and Schneider 2013a). The survey tracked all cash flows over a year for a sample of low-income and moderate-income households in 10 sites in four U.S. regions (Northern California, New York City, Eastern Mississippi, and the Kentucky/Ohio border).

Beyond the high-frequency of data collection, the method directly addressed problems with noisy and incomplete data. A custom-built database incorporated ongoing data checks to ensure completeness and accuracy, and a rigorous process was put in place to verify data after collection. The method put a priority on obtaining rich and complete financial information on households, rather than aiming to form a large, representative sample. More than 300,000 independent cash flows were collected over a year for the 244 households in the USFD sample.

The data lead to five main findings. First, the data reveal large swings in income from month to month, even after removing the impact of tax refunds

1 The finding is in Pew Charitable Trusts (2015b), figure 5. There were 7,845 Pew respondents. The portion of U.S. Financial Diaries (USFD) households giving the same answer to this question is 78 percent. In the USFD sample, two-thirds of households below the poverty line chose financial stability, with financial stability becoming more important as households gain more income.

(the largest income spike for most low-income households). Households experienced, on average, 2.7 spikes (months with income above their monthly average by at least 25 percent) and 2.7 dips (months with income below average by at least 25 percent). Typical volatility is thus not the product of one or two big spikes against a background of steady income. Instead, the ups and downs for most of the sample are part of "normal" month-to-month patterns of fluctuating income.

Second, income volatility is notably greater for households below the poverty line. Poor households faced, on average, 3.6 spikes and 3.5 dips over the year, suggesting that the challenge created by instability is an important part of the challenge of poverty.

Third, while income volatility is lower for non-poor households, volatility remains relatively high even at the top of the range studied (i.e., up to a household income of $123,000).

Fourth, income volatility is mitigated in two-earner households, where the ups and downs of independent income streams partially offset each other. Non-labor income also tends to mitigate the volatility of earned income, although the effect is small.

Fifth, not only did poor households face substantially more income volatility than other households, but the income volatility was more strongly tied to ups and downs in spending. Because poorer households face greater challenges saving and borrowing, the spikes and dips of income are more likely to translate into spikes and dips of consumption.

The rest of this paper describes related findings by others, describes the novel features of the Financial Diaries methodology, and describes the key findings and their implications.

Related Literature

Economic insecurity creates ongoing worries for households, but insecurity has been difficult to quantify. Most studies measure volatility from year to year using the Panel Study of Income Dynamics (PSID), the longitudinal data set run by the University of Michigan that has followed families since 1968. The PSID allows annual snapshots, giving results that frame the month-to-month variation revealed by the Financial Diaries.

The data on year-to-year swings show striking trends over time. In summarizing the literature, Jonathan Latner (2014) shows that all of the major studies find increasing year-to-year volatility in national surveys. Dynan et al. (2012) find a 30 percent increase in income volatility in the PSID between 1971 and 2008 (where volatility is measured by the standard deviation of percent

changes in annual income across two-year spans).[2] A 2015 update that analyzes the PSID between 1979 and 2011 finds that, in a given two-year period, nearly half of households had a gain or loss of 25 percent of more (Pew Charitable Trusts 2015a, figure 2). The Pew study finds that in 2011, the chance of a gain or loss of 25 percent or more was roughly equal (21 percent for a gain versus 22 percent for a loss). Looking back to households whose income dropped by more than 25 percent in 1994, a third had not recovered to previous income levels a decade later (Pew Charitable Trusts 2015a, 3). Gottschalk and Moffit (1994 and 2009) tie the rise in income volatility to increases in income inequality.

Income volatility has limited effect on household consumption if households can adequately smooth ups and downs through borrowing, saving, or insuring. Gorbachev (2011), however, shows that the upward trends in income volatility are echoed by upward trends in the volatility of household consumption. Using the PSID, she estimates that household consumption volatility rose by 21 percent between 1970 and 2004 (Gorbachev 2011).

The main source used to track month-to-month volatility is the Survey of Income and Program Participation (SIPP). Using the SIPP, Bania and Leete (2009) find that month-to-month income volatility in poor households grew substantially between 1992 and 2003, and that monthly income volatility is highest for the poor. A subsequent Urban Institute study finds a similar disparity in month-to-month volatility across income quintiles in the SIPP, observing households for 5 months within a 17-month time frame; the lowest quintile is estimated to have a coefficient of variation (CV) of 50 percent for monthly household income, while the middle quintile has a CV of 32 percent (Mills and Amick 2010, table 2). In a 2014 analysis of the SIPP between 1984 and 2008, Morris et al. (2015) show increasing volatility of monthly income for the poorest families and falling volatility for the richest households in the sample.[3]

2 A notable exception to these findings is Dahl, DeLeire, and Schwabish (2011), who find that income volatility is flat between 1984 and 2004 in national administrative data on labor earnings.

3 The SIPP is the best source for nationally representative surveys, but researchers worry about recall bias and seam bias. Households are surveyed every three months, and they're asked to report on the previous four months, which is a relatively long stretch when income and spending are both volatile, and when, for the poorest especially, many transactions are in cash. Seam bias is a second problem in the SIPP: Seam bias exaggerates volatility, and is manifested as an implausibly large change in income from the end of one survey cycle to the start of the next one. The problem has been addressed in recent waves. Imagine that data are collected in November with questions about the preceding four months: July, August, September, and October. The next survey then would happen in March with questions about November, December, January, and February. Seam bias occurs when the answers about the four months in a given cycle are fairly uniform, but when there's an unusually large jump between responses

A complementary approach relies on self-reported assessments of income volatility. In the 2013 Federal Reserve Survey of Household Economics and Decisionmaking (SHED), a national sample of 4,134 respondents was asked about volatility in their monthly income (Federal Reserve 2014).[4] Two-thirds of the respondents reported that their income was fairly steady from month to month.[5] In answering the same question, 21 percent of respondents reported that they experienced some unusually high or low months, and another 10 percent reported that their income "often varies quite a bit from one month to the next."

Figure 1 shows that conditions are more variable in lower-income households.[6] Using Federal Reserve SHED data, the figure shows that, among households that bring in less than $25,000 for the year, 18 percent of respondents said that income "often varies quite a bit from one month to the next." The portion falls to 9 percent among households with $25,000 to $49,999 in annual income, and decreases again to 5 percent among those with household income of $50,000 or more.

Insight into income volatility can also be seen in banking transactions. A study of 100,000 customers served by JPMorgan Chase reveals substantial month-to-month income volatility, with similar levels of volatility observed for poor and rich (JPMorgan Chase Institute 2015). The banking data are weak on informal transactions and transactions in cash, however—a concern especially when interpreting the data on poorer families. At the high end, the Federal Reserve (2014) SHED data show that income volatility for the rich is disproportionately influenced by bonuses, commissions, and fluctuations in

from one cycle to the next—i.e., from October to November. An effort to address seam bias is now in place: households are reminded of previous responses before being asked for current income data. This tends to lead to smoother responses. We appreciate input from Luke Shaefer about SIPP survey methodology. See also Mills and Amick (2010).

4 The Federal Reserve ran the Survey of Household Economics and Decisionmaking (SHED) in September 2013 to get a sense of how a broad cross-section of American households are doing today. We appreciate Julie Siwicki's assistance in relating the USFD sample to national statistics and national poverty thresholds. The SHED focuses on adults over age 18. An online panel of 50,000 individuals was sampled randomly and 6,912 were asked to take the survey. About 60 percent (4,134) agreed. The survey was quick (19 minutes was the median time), but covered a lot of ground. The relatively low response rate means that it's unclear who agreed to answer, so the claim to representativeness is unclear. The report is accompanied by an appendix which slices the data by subsamples.

5 Federal Reserve 2014, Question C.85, p. 87; 4,134 observations.

6 This result has not been published previously. We are grateful to David Buchholz, Arturo Gonzalez, and Jeff Larrimore of the Federal Reserve for sharing unpublished information from the SHED. Neither they nor the Federal Reserve are responsible for the content or interpretation of this analysis.

investment income, suggesting that the volatility experienced by richer households, while evident, may result from a desirable system of incentives.

Why is month-to-month income volatility so pronounced for low-income and moderate-income households? The 2013 Federal Reserve SHED finds that the biggest culprit is an irregular work schedule.[7] The earlier 2012 study by Dynan et al. finds that increasing levels of year-to-year income volatility are due to increases in the volatility of both work hours and wages per hour. Looking at the SIPP data, Bania and Leete (2009) find that the positive trend in month-to-month volatility among poor households is mostly due to a shift from relatively steady government benefits to reliance on relatively volatile labor earnings.

Data: The U.S. Financial Diaries

The U.S. Financial Diaries project tracked the financial lives of 235 low- and moderate-income households over the course of 12 months. Here, we analyze a slightly broader sample of 244 households that reported income data for at least eight full months.

The financial diaries are not actual diaries filled out by respondents. Instead the term "diaries" is used to reflect the high-frequency nature of the data collection and the intent to capture as many details as possible, especially those that are not easy for outsiders to see.

The U.S. Financial Diaries aimed to go beyond the usual focuses on income and assets, and close attention was also paid to within-year cash flows (see Morduch and Schneider 2013a). Over the course of the study, 316,763 cash flows were collected in an attempt to capture every dollar spent, earned, borrowed, saved and shared. The data are not perfect, but a series of steps were taken to ensure data quality (described below). Most important, field researchers met with the households every two to four weeks to minimize reliance on long periods of recall. The regularity of the meetings helped build trust and provided the chance to fill in gaps as the study proceeded.

Households were sampled in four research sites: New York City, Ohio/Kentucky, Eastern Mississippi, and San Jose/Central California. Together, the samples represent a variety of household characteristics and environments, but the households are not a random sample. They were chosen to reflect typical parts of working America, not to form a representative population. The data are not weighted to reflect national population shares.

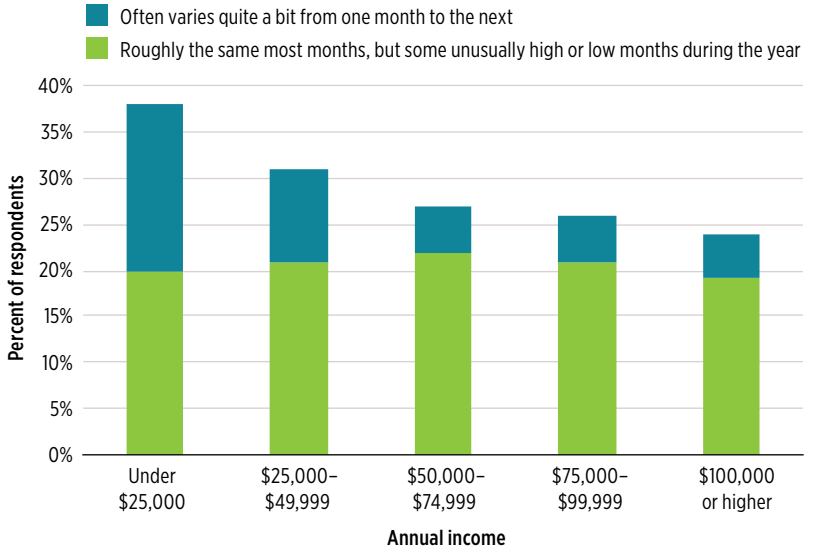
7 Federal Reserve 2014, question C.86, p. 87. This question was asked only of those who said either that income "varies quite a bit from one month to the next" or is "roughly the same in most months, but some unusually high or low months during the year."

Attrition from the USFD sample during the main survey period contributed to different households having different lengths of data collection. Of the 268 households that reported their income, 91 percent (244 households) have at least eight full months of income data, which is the sample that we analyze in this paper.

To focus the analysis on the typical experiences within the sample and to minimize the impact of data error, we exclude the 5 percent of households with the most volatile income. These are households that have a coefficient of variation of monthly household income greater than 89 percent. To focus on "normal" ups and downs, we also remove tax refunds from income (and compare results with and without tax refunds).

To normalize the data across regions, we compare household incomes to poverty thresholds defined in regional supplemental poverty measures (SPMs) (United States Census Bureau 2010). The income is thus expressed as a percentage of the SPM threshold, with poverty defined by having income under 100 percent of the SPM threshold. An important advantage of deflating by the SPM is that it controls for differences in regional cost of living.

Figure 1. Self-reported monthly income volatility, Federal Reserve SHED Survey 2013



Challenges to Accurately Measuring Volatility

Special attention was given to noisy data and two additional problems when measuring income volatility.

Noisy data. Problems with recall create noise in the data, and the noise can exaggerate impressions of volatility. Misremembered timing may also create the appearance of spikes and dips: households may forget when exactly income was received or when spending occurred, so cash flows may get clumped together in self-reported data, creating the false appearance of spikes. Misremembering is worst in households where there is greater dependence on cash (because fewer records are kept) and where income is patched together from varying sources with irregular payments (due to part-time work, self-employment, irregular hours, overtime, etc.). These households tend to be poorer, and the noise can give an exaggerated impression that poorer households have more volatile income.

The Financial Diaries methodology built in a series of steps to minimize noise. Most important, during data collection, field researchers revised upcoming surveys to capture new information. The team also tracked inconsistencies in inflows, outflows, and cash balances; the inconsistencies triggered follow-on questions, especially about cash income.

After the main period of data collection ended, for six months the team went back to the households to verify evidence indicating unusually high or low values for income or spending. The team then determined if the spikes and dips were due to measurement error or not and could probe which cash flows were missing or misrecorded. The focus was on outliers that could most easily skew the picture, especially values 50 percent above or below the household's median monthly income.

In the follow-up period, the team also checked unusually big or small values of tax refund flows, sales of physical assets, and withdrawals from retirement accounts. A similar process was used to detect typos and mistaken duplicates of information. As a cross-check, the team then turned to data collected on the form of transaction and on financial mechanisms. The team checked income inflows against the mode and deposit data to determine the net amount of the income inflow. The team then checked summary statistics to detect outliers and patterns that appeared inconsistent with the field researchers' understandings of the households and the overall sample.

Time units. When volatility is measured within a year, the focus is usually on month-to-month variation. Months go from the 1st to the end of the month, but if an end-of-month paycheck is delayed by a few days (or a beginning-of-month paycheck hits early), it can look like there's more volatility than households actually feel. Similarly, steady weekly earnings can translate

into choppy monthly earnings: when workers are paid weekly, some longer months will include five paychecks, and thus will have 25 percent more income than months with just four paychecks. But from the households' perspective things are steady week by week. We address these issues in the analysis below, by checking for robustness by redefining the time units and spreading the irregular monthly income associated with week-based (and biweekly) payment schedules.

Trend. When income is steadily rising over a time frame, measures of volatility can give the impression that there are ups and downs when in fact there is just a steady trajectory. This is because along the upward trajectory, households first spend time below their mean for the period and then time above their mean (the opposite occurs for households with falling income). We test for robustness by looking for differences when measuring volatility around the household-specific trend (rather than around the average income). Although we see both positive and negative trends over time in monthly household income, we find that income around these trends is as volatile as income around the (flat) average.[8]

Results

The data yield five major findings: (1) month-to-month income volatility is substantial; (2) volatility is greatest, on average, for poor households; (3) middle-income households face substantial volatility; (4) earners within the same household can offset volatility, as can non-labor income; and (5) the effects of income volatility translate into consumption volatility with greatest force for the poor.

Perceived Income Uncertainty

The main results report on cash flow data. At the start of the project, however, we asked households directly about volatility. They were asked: "How easy was it to predict total household income during the month?" The responses suggest substantial insecurity, with a marked trend by income, where having a higher annual income corresponds to experiencing much less uncertainty relative to the perceptions of poorer households. The pattern is reproduced in the observational data.

Households could choose from five answers that range from "very easy" to "very difficult." Comparing the answers across income groups, we find that

8 The slope and intercept of each household's income trend are estimated in an ordinary least squares regression of the household's monthly income on time (where the month is the unit of time). The results are not included here.

households who say income is easier to predict tend to be better off, with an average income of 165 percent of the poverty line in their area. In contrast, households reporting that their income is "very difficult" to predict had an average income just below the local poverty threshold (96 percent of the poverty line).

The survey guided households by providing monetary benchmarks: income that was "very easy" to predict could be predicted to the nearest $100, while "easy" corresponds to the nearest $200, "not easy" to the nearest $500, "difficult" to the nearest $1,000, and "very difficult" to the nearest $2,000. To frame the results above, we divided the amount at which income was reported as being unpredictable (i.e., $100, $200, etc.) by the household's average monthly income over the following year. The ratio delivers a rough calculation of the portion of average monthly household income that respondents view as unpredictable.

Table 1 reports that, below the poverty line, on average 26 percent of income was reported as being not easy to predict. For households with annual income between 100 percent and 150 percent of the poverty line, 15 percent of income could not be easily predicted. And among households between 200 percent and 300 percent of the poverty line (which is around households' median area income), just 9 percent of income was viewed as not easily predictable.

The Extent of Month-to-Month Volatility

Spikes and Dips in Cash Flow Data

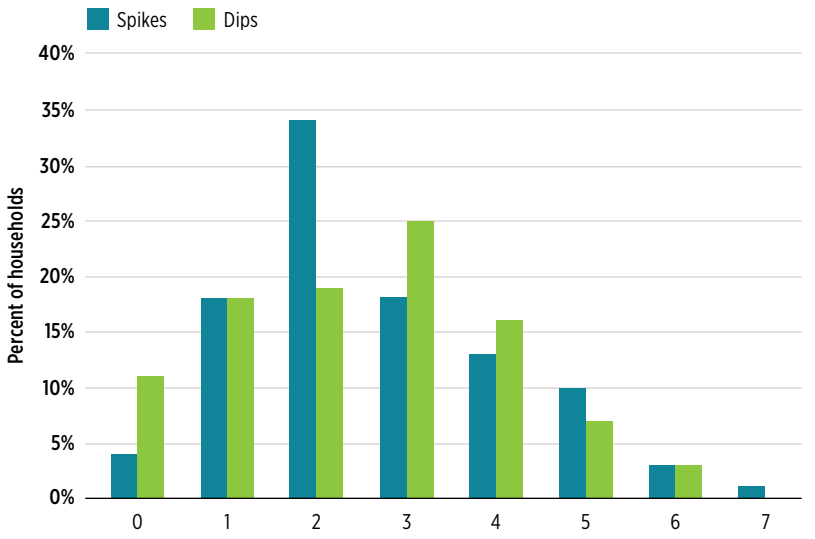
The self-reported uncertainty above parallels evidence from observed cash flows during the year. A starting point in measuring income volatility is to count the number of months in a year when measured income is far from its average. We follow Morduch and Schneider (2013b) in defining an income spike as a month when income is more than 125 percent of the household's

Table 1. Self-reported unpredictable portion of income

PERCENT	POOR (< 100% SPM)	NEAR POOR (100%–150% SPM)	MODERATE (150%–200% SPM)	MIDDLE INCOME (> 200% SPM)
Average	26	15	9	9
Median	17	9	5	3
Number of households	54	48	57	44

Note: Household income is normalized by the local threshold established by the U.S. Census Supplemental Poverty Measure (SPM). "< 100% SPM" indicates poverty.

Figure 2. Income spikes: distribution of households by number of income spikes or dips during the year, U.S. Financial Diaries



average. Similarly an income dip is a month when income is below 75 percent of the household's average.

Both spikes and dips are common. On average, households had 2.7 income spikes and 2.7 income dips in 12 months.[9] Pooling spikes and dips, households had on average 5.4 spikes or dips in 12 months. In these months, the average spike in income is in fact 55 percent above the household's average monthly income, while the average dip is 45 percent below average income. Figure 2 gives the distribution of spikes and dips across households, showing a slight skew to the right tail in the distribution of households.

Coefficient of Variation of Month-to-Month Household Income

The coefficient of variation is the most common measure of income volatility over time. The CV is the standard deviation of a household's monthly income over time expressed as a percentage of the household's average monthly income during that same period. Across USFD households, we find an average

9 The number of spikes or dips was annualized if a household had fewer than 12 months of complete income data.

CV of income of 39 percent (the left column of table 2). The finding lines up with the analysis of spikes and dips above. To see this, consider a hypothetical case in which a household's monthly income held steady at its average income during half of the year and then was 50 percent above average for the next three months and then 50 percent below average for the final three months. That pattern roughly mirrors the pattern of spikes and dips in the USFD data, and it similarly generates a CV in the range here (35 percent).

The CV result is comparable to findings in national studies. In the national 2001 SIPP panel, the average CV in the lowest three quintiles falls between 32 percent and 50 percent.[10] An analysis of the SIPP (Bania and Leete 2009) shows the median level of volatility, which ranges from 28 percent just below the poverty line to 18 percent above 150 percent of the poverty line. The median CV of income in the USFD sample is somewhat higher at 34 percent. No households in the Financial Diaries study have perfectly steady income; the lowest CV is 10 percent.[11]

A series of steps were taken to check robustness, detailed in table 2. The base result (a 39 percent CV) is from a sample that removes the 5 percent most volatile households in an effort to control for measurement error beyond the checks already in place. In the full sample, the average CV rises to 46 percent. Focusing just on the 124 households that field researchers indicated as being "high-grade" in data quality reduces the CV to 36 percent, giving confidence in the benchmark number of 36 percent. Income from tax refunds was removed from income in the benchmark; considering income inclusive of tax refunds takes the CV to 51 percent. The Brooklyn site posed the largest difficulties in data collection, though removing that part of the sample left the overall CV relatively unaffected at 37 percent. A final source of spurious volatility can occur through the imposition of months on income earned weekly, or through a payment expected at the end of one month which is delayed by a few days, making the first month low and the next month high. Efforts to address both possibilities generate CVs of 37 percent and 38 percent, again close to the benchmark.

10 In Mills and Amick (2010), seam bias was avoided by including only the month of data that immediately preceded interviews, effectively observing 5 months of household income spread out over a 17-month span.

11 The disaggregated data show that households vary in their level of volatility. The standard deviation of the coefficient of variation of income is 19 percent, within a right-skewed distribution. The bulk of households (68 percent of them) have volatility (CV) of income distributed close to uniformly between 15 percent and 45 percent, with decreasing incidence on either side of this range. The exception to the large group of households is the long, right tail, where 18 percent of households center between a 60 percent and a 90 percent CV of income. The same general pattern holds when the data are restricted to households which field researchers believed were to be of the highest quality.

Table 2. Coefficient of variation (CV) of monthly household income

SAMPLE	SUMMARY STATISTICS	INCOME AS PERCENT OF SUPPLEMENTARY POVERTY THRESHOLD				
		ALL	< 100%	100%–150%	150%–200%	> 200%
Households below 95th percentile of CV	Average	39	55	35	32	33
	Median	34	54	33	29	29
	Obs	231	64	53	59	53
All households	Average	46	66	40	36	38
	Median	36	56	33	30	30
	Obs	244	68	56	64	56
High-grade households	Average	36	48	32	35	31
	Median	32	44	31	30	29
	Obs	124	28	29	37	29
Including tax refunds in income	Average	51	62	53	47	42
	Median	45	66	46	42	39
	Obs	226	60	54	59	52
Excluding Brooklyn households	Average	37	51	32	31	33
	Median	32	47	30	29	29
	Obs	209	50	49	56	52
Month starting on the 8th	Average	37	52	31	31	31
	Median	32	48	26	29	25
	Obs	231	65	53	59	53
Spreading week-based income	Average	38	55	32	30	31
	Median	32	54	30	28	28
	Obs	231	64	53	59	53

Note: Household income is normalized by the local threshold established by the U.S. Census Supplemental Poverty Measure (SPM). "< 100% SPM" indicates poverty. The "combined robustness checks" row excludes tax refunds from income, starts months on the 8th, spreads week-based income, and narrows the sample to high-grade households, excluding households in Brooklyn (site eight), and excludes households above the top five percentile of CV in the remaining sample.

Income Volatility across Income Levels

Spikes and dips are pronounced across the sample, but they are greatest for the poorest part of the sample. Figure 3 shows that below the poverty line, the average number of income spikes is 3.6 over the year, and the average number of dips is 3.5. The averages above the poverty line are considerably reduced, but the highest income group in our sample (with income more than twice the local poverty line), nevertheless experience 1.9 spikes and 2.7 dips per year.

In line with this, the average coefficient of variation of month-to-month household income is also greatest below the poverty line, where the average CV is 55 percent. Among households between 100 percent and 300 percent of the poverty line, the CV of income is roughly flat, staying near an average CV of 34 percent (see table 2 and figure 4).

Similar trends in income appear in the national SIPP data, where Mills and Amick (2010, table 2) estimate that the CV of income in the first quintile is 50 percent, up from 37 percent in the second quintile, which is up from 32 percent in the third quintile.

Table 2 shows that checks for robustness raise and lower the average level of the CV, but the distributional pattern is maintained. Each check shows a high CV for poor households and a lower, relatively flat CV for non-poor households.

Hedging and Diversification in Labor Earnings

The volatility of labor earnings shows a similar trend to that of household income: labor earnings volatility falls on average with the level of average income relative to the household's poverty threshold (see table 3 and figure 4). The steepest difference in earnings volatility is across the poverty line, while the differences are small across income groups above the poverty line.

Labor earnings are less steady than total income during the year, and the difference is greatest for low-income households (table 3). A simple comparison at the average reveals that non-labor income tends to help steady households at each income level—even though non-labor income itself tends to be very unsteady. Examples of non-labor income are food stamps, child support, social security for disabilities or old age, safety-net support from religious institutions and nonprofits, and gifts from friends or family. The mitigating effect of non-labor income is especially large for lower-income households, where the CV of income from jobs is greatest compared to the CV of total income.

Nichols and Zimmerman (2008) use annual data to argue that the volatility of family income increased over time as men's and women's incomes have become more correlated. We cannot address changes over time in the Diaries, but we can investigate diversification within households. In the sample, the

Figure 3. Income spikes: average number of spikes or dips in income during the year, by income group, U.S. Financial Diaries

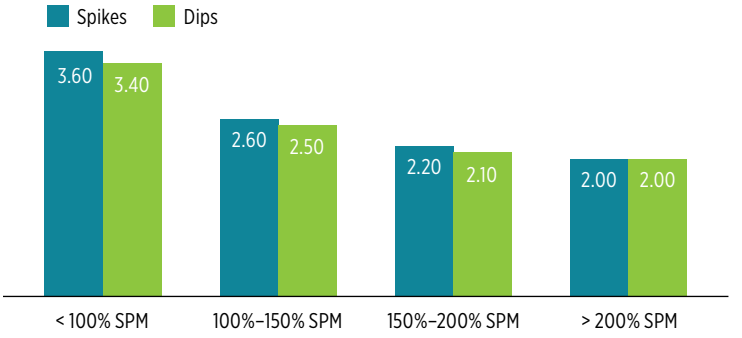


Figure 4. Volatility in income types (average CV by income group), U.S. Financial Diaries

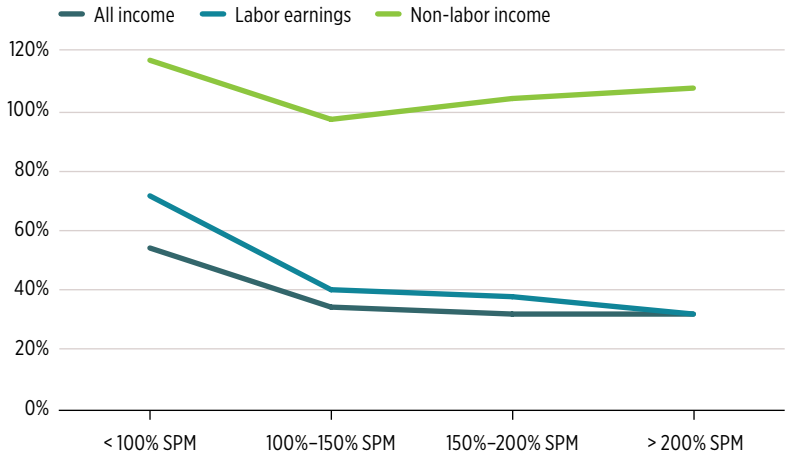


Table 3. Volatility (CV) of income by source

SOURCE	POOR (< 100% SPM)	NEAR POOR (100%–150% SPM)	MODERATE INCOME (150%–200% SPM)	MIDDLE INCOME (> 200% SPM)
HOUSEHOLD INCOME				
Average	54	34	32	32
Median	49	32	28	30
LABOR EARNINGS				
Average	72	40	38	32
Median	69	34	36	28
NON-LABOR INCOME				
Average	117	97	104	108
Median	79	68	72	91
Number of households	43	44	48	35

Note: Coefficient of variation of month-to-month income. Household income is normalized by the local poverty threshold established by the U.S. Census Supplemental Poverty Measure (SPM). "< 100% SPM" indicates poverty. Table excludes households above the 95th percentile in CV of total income, labor earnings, or non-labor income.

labor earnings of adults are on average 70 percent of a household's income during the year. Tax refunds and credits are on average 9 percent of total income for the same sample.

Adults in a household may be able to significantly reduce their combined earnings volatility by diversifying their labor income. Across households, the average correlation in labor earnings between a man and a woman in the same household is 0.17, with a relatively large standard deviation of 0.34 within a left-skewed distribution. The median correlation is slightly higher, at 0.20.

The evidence shows that a man's coefficient of variation of labor earnings is on average 17 percent higher than the coefficient of variation of labor earnings of the household. This implies a substantial role of the woman's earnings in reducing the household's volatility. Still the drop in volatility is only a bit less than a fifth, leaving 83 percent of the volatility in male labor earnings to translate into volatility in total household earnings. Similarly, a woman's coefficient of variation of labor earnings is on average 26 percent higher than that of the household, which also suggests that the steadying effect from men's and women's earnings is roughly equal on average.

In the sample, women tend to be the secondary earners in terms of income, although not always. We distinguish the labor earnings share of the worker from their gender, though we find similar results in either analysis. Across households, the average correlation between the primary earner and the secondary earner is

0.14, still with a relatively large standard deviation of 0.34 within a left-skewed distribution. The median correlation is slightly higher at 0.16.

The evidence shows that the coefficient of variation of earnings from the primary earner is just 5 percent higher than that of the household, due to the labor income of the secondary earner, which indicates relatively little volatility-reduction from secondary workers on average.

The results by gender and earnings-share differ from each other slightly. A simple comparison shows that the damping by the woman's earnings owes largely to the portion of households where the woman is the primary earner. In general, the data show that primary earners, while they obtain higher labor earnings during the year, also have much steadier labor earnings. So it is not surprising that women's earnings tend to act strongly against the volatility from the male secondary in the same household, while the effect tends to be smaller when women are the secondary earners.

The analysis of adults so far does not highlight marital status. Similar to national figures, the USFD sample shows that working men and women who are married account for about half of the total number of households where working men and women live together. We compared the main results here to the results for married couples and found little difference. The average correlation in labor earnings between married couples is 0.12, down from 0.17 in the full sample. The standard deviation is still relatively large at 0.34 within a right-skewed distribution. The median is lower, at 0.05. While this comparison suggests a slightly lower correlation generally among spouses, the difference is relatively small and the correlation still tends to be positive (rather than distinctly negative).

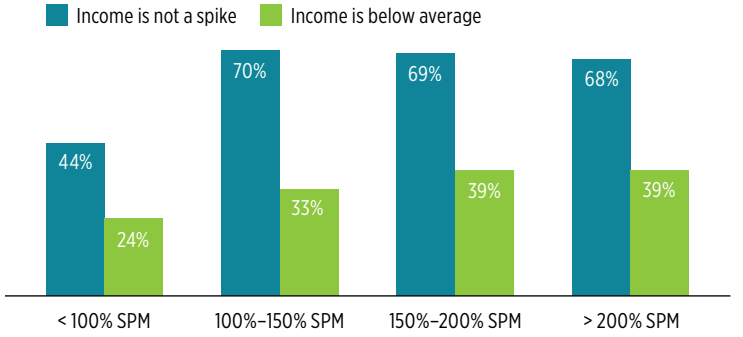
Consumption Smoothing and Mismatch

Households save, borrow, and share with others as a way to insulate their consumption from the ups and downs of income. Overall, the correlation of monthly income and monthly spending is 0.43, indicating considerable smoothing. Households are not living paycheck to paycheck, which would be implied by a correlation of 1.0.

Consumption-smoothing is most difficult for poor households, who tend to lack a substantial cushion of savings and have greater difficulty borrowing. In line with this, for better-off households the income-consumption correlation is relatively low at 0.36. For poor households, the income-consumption correlation is much higher at 0.53.

The ability to smooth consumption can also be seen in comparisons of the timing of income spikes/dips and spending spikes/dips, where both are defined as months in which income or spending is greater or less than 25 percent of the monthly average for the year.

Figure 5. Mismatch of spending spikes and income spikes, U.S. Financial Diaries



Note: Across income groups, the percent of months in which spending spikes occur without a corresponding income spike (dark bar) and where monthly income is below its average for the year.

Looking at the timing of spending and income across the sample, 61 percent of spending spikes occur when there is no matching income spike, and 33 percent of the spending spikes occur when income is below the average level. This mismatch between income and spending levels is more common above the poverty line (see figure 5). For the poor, spending tends to track income more closely, suggesting fewer options to de-couple spending and income. In this sense, greater mismatch is a sign that households have more options, since it means that households have the means to spend when they want, irrespective of the timing of income. Poor households are much more likely to delay spending until income is available or to find extra income when spending is needed. The evidence on mismatch, in sum, shows that not only do poorer households have less stable income, but the fluctuations in income are more likely to translate into fluctuations in consumption.

Conclusion

Economic insecurity is a growing concern in America, part of a story about transformations in the country that parallel transformations in inequality and mobility (e.g., Western et al. 2012). Uncertainty directly affects well-being and complicates choices over jobs, budgeting, planning, saving, and borrowing.

Income is seldom completely steady over the year. For many Americans though, the bumps are hardly noticed: the ups and downs are small and households have enough saved up to provide a financial cushion. But not

everyone has a good cushion, and many households experience large spikes and dips.

Most financial data on insecurity tracks changes from year to year. Here, we analyze data designed to capture ups and downs within the year. The U.S. Financial Diaries data are not representative of the United States population, but the sample reflects important elements of the U.S. population—big city, small city, small town, and rural; immigrant and U.S.-born; white and black; poor, low-income, and moderate-income. A series of robustness checks shows that while particular numbers change depending on the sample, the general patterns do not. The findings align, too, with data from large national surveys.

We show that overall income volatility is relatively high during the year, and it is particularly high for the poor. When more than one adult household member is working, total household labor earnings volatility tends to fall, but households are still exposed to considerable volatility. Better-off households are able to smooth the swings to a degree, while the spending of poorer households is much more likely to track the ups and downs of income.

The results suggest that within-year income variation deserves far greater attention. The challenges of living on a low income begin with limited resources, but the difficulties faced by households are exacerbated by the swings of income from month to month.

The evidence suggests that the problem of poverty is not just one of low incomes. Poverty is also tightly bound up with the volatility and uncertainty of income, a notion developed in an international context by Collins et al. (2009) and in the U.S. context by Edin and Shaefer (2015). The finding has implications for the design of means-tested programs and is a cornerstone of a broader view of the condition of poverty (e.g., Mullainathan and Shafir 2013).

The evidence also shows that the poor are not alone in facing substantial income volatility. Many households at the highest range in our data (around the local median income) also face considerable income volatility. Policies to reduce volatility, or that give households better financial tools to accommodate volatility, thus hold the possibility of improving the well-being of a broad section of working America. ■

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SECTION 3

Economic Mobility & Communities

Individual and Community Economic Mobility in the Great Recession Era: The Spatial Foundations of Persistent Inequality

ROBERT J. SAMPSON
Harvard University

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Once relegated to debates in the halls of academe, it is now common knowledge that income inequality is increasing. Most of the attention has focused on the pulling away of the very rich—the so-called "one percent" whose gains have far outpaced those of everyone else (Piketty 2014). But academic and public concerns go well beyond the very top. The hollowing out of the middle class, stagnation of wages, and recent evidence on the lack of upward mobility across generations all strike at the very heart of the American ideal. In one widely reported study, the odds of a child from a poor family climbing up the income ladder to reach the top fifth of the income bracket as an adult were less than 10 percent for the nation (Chetty et al. 2014b).

Less debated but no less consequential is the fact that individuals are born into, grow up in, and become adults in neighborhoods that are also highly unequal. Concentrated poverty, violence, and poor school quality, for example, tend to cluster together at the neighborhood level and influence life chances across a variety of outcomes. It follows that equal attention should be paid to community-level inequality. In particular, individual transitions into and out of neighborhood poverty and the distribution of neighborhood income status over time are fundamental to understanding the nature of income inequality and the impact of neighborhood contexts on individual outcomes. Yet surprisingly little is known about stability and change in the spatial foundations of neighborhood inequality, especially the movement of individuals across different income environments over crucial periods of the life course and historical eras.

This paper addresses these challenges by reporting results from a new long-term project that combines the study of neighborhood change across the United States with an original longitudinal study of individuals in two American cities that are very different in urban form and history: Chicago and Los Angeles. The paper addresses two basic questions: (1) how mobile are neighborhoods, and (2) how mobile are individuals across neighborhood income types? At the neighborhood level (question 1), stability and change in economic status are examined across two decades for all urban neighborhoods in the United States, and neighborhood-level changes in economic status are examined specific to Chicago and Los Angeles. The paper assesses whether patterns of neighborhood mobility were similar throughout the last two decades, or whether they differ between the relatively prosperous 1990s and the Great

Recession era. In both cities and for the nation as a whole, the data show that neighborhood income status is surprisingly persistent at the extremes.

At the individual or contextual level (question 2), who moves up versus down the neighborhood income ladder is examined, as well as how the mobility of individuals across neighborhood income status varies by race, socioeconomic factors, individual characteristics, life-cycle change, and the shock of the Great Recession. Analogous to individual mobility studies, this paper examines how common is it for children who grew up in a poor neighborhood to attain a higher-income neighborhood in adulthood. An essential American notion is that individuals can triumph over circumstance and that individuals, including the poor, can always move to a better neighborhood—what can be thought of as upward contextual mobility (Sharkey 2013, 16). In this view of neighborhood mobility, individual characteristics govern escape from neighborhood poverty. Assessing this claim with data on neighborhood economic attainment among individuals, based on longitudinal studies from Los Angeles and Chicago, the evidence leads to the same conclusion: upward contextual mobility in neighborhood economic status is relatively rare and governed by a structure of stratification that is persistent and strongly linked to race. Legacies of neighborhood inequality are thus more resilient than commonly assumed and call into question policies that unduly focus on individual mobility or that ignore the unique contextual environments that blacks have historically endured in the United States.

The following section briefly reviews the literature that motivates the focus on neighborhood-level inequality and describes the data and measures before presenting the key findings. The concluding section synthesizes the main results and probes their implications for whether and how policies should intervene in the lives of individuals (e.g., housing vouchers) or at the scale of communities (e.g., place-based interventions), including the question of whether "affirmative action for neighborhoods" is needed.

The Spatial Foundations of American Inequality

Over 50 years ago the urbanist Lewis Mumford claimed, "Neighborhoods, in some primitive, inchoate fashion exist wherever human beings congregate" (1954, 258). The contemporary archaeologist Michael Smith (2010, 137) finds broad empirical support for this claim, arguing that the "spatial division of cities into districts or neighborhoods is one of the few universals of urban life from the earliest cities to the present" (see also Smith et al. 2014). The salience of neighborhood difference has persisted across long-time scales and historical eras despite the transformation of specific boundaries, political regimes, and

the layout of cities. The fact of neighborhood differentiation from ancient cities to the present suggests that spatial arrangements constitute a fundamental organizing dimension of social inequality (Sampson 2012, 362).

There is a large body of research that supports this idea using a variety of empirical definitions of urban neighborhood, which can be conceptualized as a geographical subsection of a larger city or region that has socially distinctive characteristics (Sampson 2012, 53–57). Some examples of the operational units that researchers have used to measure neighborhood characteristics include city block groups, census tracts, city planning or health districts, political wards, and locally defined community areas. It is beyond the scope of this paper to summarize the voluminous research on neighborhoods using these various units, but there is widespread consensus that there is considerable social inequality between neighborhoods, especially in terms of socioeconomic position and racial/ethnic segregation (Massey and Denton 1993; Sampson 2012, 31–49).

There is less consensus on the status of neighborhood effects on outcomes like economic achievement, health, and crime. A major worry is the possibility that the estimated effects of factors like concentrated poverty instead reflect the effects of prior family characteristics or individual choices. For example, individuals may systematically select high-income neighborhoods based on the same characteristics that also predict positive adult outcomes (e.g., family income, parental education, home ownership), leading to spurious associations. Observational studies have been criticized for such "selection bias" (Mayer and Jencks 1989). In addition, evidence from the "Moving to Opportunity" (MTO) randomized voucher experiment in five cities (Ludwig et al. 2012; Sanbonmatsu et al. 2011) has cast doubt on the causal role of neighborhood poverty on adolescent outcomes and young adult achievement.

Comprehensive reviews of the literature have nonetheless identified credible evidence of the deleterious effects of concentrated disadvantage on a number of individual outcomes relevant to understanding economic mobility, especially with respect to longer-term or developmental neighborhood influences (see e.g., Galster et al. 2007; Galster 2011; Leventhal and Brooks-Gunn 2000; Sampson 2012; Sharkey and Faber 2014). For example, Wodtke, Harding, and Elwert (2011), Wodtke (2013), and Sharkey and Elwert (2011) find that living in a disadvantaged neighborhood has negative effects on high school graduation and cognitive ability, with longer durations of exposure to concentrated disadvantage associated with more negative outcomes. Sampson et al. (2008) find that growing up in severe disadvantage attenuates the learning of verbal skills, approximately equivalent to losing a year in school, and Sharkey (2010) finds that exposure to neighborhood violence depresses test scores. Using national-level U.S. data on income mobility, Chetty and colleagues

(2014a) report that the odds of intergenerational income mobility vary sharply by geography. High mobility places, such as San Jose and Salt Lake City, are characterized by less neighborhood segregation, less income inequality, better primary schools, greater "social capital," and greater family stability.

There is also experimental evidence of long-term neighborhood effects on adult income attainment. A recent study of the MTO participants found that voucher-induced moves to a lower-poverty neighborhood during childhood are associated with higher adult earnings and that the magnitude of this effect declines with age, eventually flattening out to no effect among those who were adolescents at the time of moving (Chetty, Hendren, and Katz 2015). This pattern strongly suggests that the duration and timing of exposure to concentrated poverty is important for later adult outcomes, especially upward economic mobility. Moreover, when researchers compared the MTO voucher study to observational studies obtained from the same city, they found convergent negative effects of concentrated poverty on cognitive skills that were larger for those children who moved out of the most severely disadvantaged environments (Burdick-Will et al. 2011). Comparing across MTO sites, children's test scores were also found to improve the most when residential changes led to major reductions in exposure to violent crime.

In sum, although causality is rarely definitive in the social sciences—even in randomized experiments (Sampson 2008)—prior research provides strong motivation for prioritizing the study of neighborhood economic mobility. Indeed, the evidence showing that neighborhood poverty inhibits verbal learning and high school graduation commands our attention if we are concerned about economic mobility. It is not only upward or downward neighborhood mobility that is at stake, but the interrelated components of human and social capital that undergird such mobility. The project described in the next section permits a direct examination of stability and change in the spatial foundations of neighborhood inequality and the movement of individuals across different income environments over crucial periods of the life course.

The Mixed-Income Project

The Mixed-Income Project (MIP) is a longitudinal and probability-based study that followed individuals from Los Angeles and Chicago and tracked their residential histories. The two anchor studies for the MIP are the *Project on Human Development in Chicago Neighborhoods* (PHDCN) and the *Los Angeles Family and Neighborhood Survey* (L.A.FANS, hereafter LAFANS). The PHDCN and LAFANS are widely recognized for rich longitudinal data on neighborhoods and on educational, health, and behavioral outcomes. The MIP

was designed to study individual and neighborhood dynamics and to permit comparison of a newer Southwest city (Los Angeles) fundamentally different in urban form and composition than the older "Rust Belt" context exemplified by Chicago. In particular, Los Angeles is characterized by more suburban sprawl and less racial segregation than Chicago. Further details on the sampling design and rationale for the two study sites are provided in related papers (Perkins and Sampson 2015; Sampson, Mare, and Perkins 2015a; Sampson, Schachner, and Mare 2015b).[1]

Measures and Strategy

This paper examines and compares two measures of neighborhood income status—median family income at the census tract level and the degree of mutual exposure of lower- and higher-income persons within a census tract.

The first measure, median family income at the census tract level, is a summary indicator of neighborhood quality and resource potential with the added benefit of a clear metric—the dollar. Each tract in the United States and within Los Angeles County and Chicago's Cook County is assigned to a median family income quintile with cut points based on all U.S. census tracts within counties that are at least partly within a metropolitan statistical area at four points in time: Census 1990, Census 2000, American Community Survey (ACS) 2005–09 and ACS 2008–12.[2] This approach enables neighborhood trajectories to be tracked relative to each other and relative to the national distribution simultaneously.

1 Briefly, the PHDCN is based on a probability-based sample of children and caretakers assessed starting in 1995 and again in two follow-ups at approximately two and a half year intervals, ending in the early 2000s (wave 3). In 2012–13, the Chicago Mixed-Income Project (MIP) traced and re-interviewed randomly sampled participants last contacted at wave 3 of PHDCN in the original birth cohort and the age 9–15 cohorts. Despite the long time that elapsed since last contact at wave 3 and the contemporary setting, the MIP fourth wave achieved a response rate of 63 percent of eligible cases overall (1,057 respondents). The analyses in this paper focus on the 9-, 12-, and 15-year-old cohorts who transitioned to young adulthood (ages 26–32) by 2013. LAFANS is also a probability-based sample of both children and adults assessed at two waves (1999 and 2007). The third wave MIP follow-up in 2012–13 achieved a final response rate of 76 percent of eligible participants for a combined sample of 1,032. Addresses were geocoded at each wave and matched to census data from 1990, 2000, and the American Community Surveys (2005–12).

2 Median family income quintile cutoff points are based on national metropolitan statistical area (MSA) census tracts (excluding Puerto Rico and tracts with family populations below 50)—rather than all census tracts (i.e., including rural areas)—because they better reflect the urban and suburban contexts of theoretical interest. MSAs also constitute a more accurate basis of comparison for Los Angeles and Chicago areas, which are particularly urbanized.

The second measure is the degree of mutual exposure of lower- and higher-income persons within a census tract. The Index of Concentrated Extremes (ICE) = $\frac{A_i - P_i}{T_i}$, where A is the number of affluent residents in neighborhood i, P is the number of poor residents, and T is the total number of residents. ICE can range from –1 (all residents are poor) to 1 (all residents are affluent).[3] Greater income mixing or a more even balance of the poor and affluent, typically in middle class areas, is centered on zero. As with median income, neighborhood transitions are examined across nationally determined ICE quintiles.

At the individual level in Los Angeles, mobility tables are described for changes in median family income and ICE quintiles of respondents' neighborhoods between Census 2000 and ACS 2008–12, aligned with LAFANS wave 1 and the MIP survey. For Chicago, census measures from 1990 and 2000 were interpolated to the year of interview for waves 1–2, and the ACS 2008–12 for wave 4. The focus on quintiles comports with prior research on income mobility at the individual level (Chetty et al. 2014a) and neighborhood level (Sampson et al. 2015a). The study design permits the comparison of two phases of the life course at the individual level: the transition to young adulthood and the period of middle adulthood. Specifically, this paper examines 670 children and early adolescents (9–15, average age of 12) in Chicago who transitioned to young adulthood over the course of the study. By 2012, the Chicago adolescents were between the ages of 26 and 32. The mobility transition is thus from the social origins of the parental or home neighborhood when growing up to the neighborhood in which the individual resides as an adult (cf. Hout 2015). In Los Angeles, the focus is on middle adulthood, looking at neighborhood income trajectories of adults (with and without children) from the initial LAFANS wave 1 interview that were confirmed to reside within L.A. County during their wave 2 and MIP interviews. The analytic file of 635 randomly selected adults were about 40 at baseline. In both samples, the data are weighted to reflect the sampling design and potential attrition bias.

Taken together, the MIP research designs for Chicago and Los Angeles, combined with a national-level picture of neighborhood income mobility, offer a unique vantage point for addressing the theoretical questions of this paper.

1. Necessary information is gained on the large-scale structural changes that shape individual lives and choices by focusing on neighborhood-level transitions, both nationally and in Chicago and Los Angeles.

3 Operationally, the national upper- and lower-income quintiles of family income are used as the cutoffs for affluent and poor families, respectively. ICE scores were assigned each year from 1990 to 2010 (using interpolation) at the census tract level in the Chicago area and for all neighborhoods in the United States. The ICE measure thus controls for shifting income distributions over time (Sampson et al. 2015a, 161).

2. The MIP is based on coordinated representative samples, in contrast to samples that are selected on the outcome of interest, such as neighborhood income attainment.
3. The longitudinal data are rich in detail, measuring a wealth of similar information on both individual background characteristics and transitions over the life course. In Chicago, the data span a considerable period of the adolescent and young adult life course—approximately 18 years for three age cohorts—and in Los Angeles, the data span a dozen years across middle adulthood.
4. The research design permits examination of pre- and post-Great Recession measures of income at both the individual and neighborhood levels.
5. Both sampling designs capture well the racial and ethnic diversity of the United States and how cities have changed, including a significant representation of first- and second-generation immigrants.

Community-Level Transitions

Table 1 presents the mobility rates for all (50,000+) metropolitan neighborhoods in the United States. Panel 1 shows considerable persistence in income segregation. Just over 80 percent of neighborhoods in the United States that were in the bottom or top quintile of neighborhood median income in 1990 remained there in 2000. Similarly, in the decade of 2000–10 there was a persistent rate of over 75 percent for low-income neighborhoods and virtually no change in the probability that affluent neighborhoods retain their status (approximately 80 percent). There is little upward or downward mobility across the decades, despite widespread reports of gentrification in recent decades. For example, less than 3 percent of neighborhoods nationwide in the bottom two categories of income moved above the 60th percentile of income in either decade. Only a handful of neighborhoods rose from the bottom fifth to the top fifth. Downward mobility of neighborhoods is extremely rare too, even in the decade of the Great Recession, when change mainly took place in the middle of the income distribution. Roughly half of middle-income neighborhoods stayed in the middle category, with mobility more or less evenly split between upward and downward movement in both decades. Table 2 demonstrates that the basic patterns do not change when transitions in concentrated extremes of income (ICE) are examined.

This paper also examines neighborhood-level transitions for the counties that contain Chicago and Los Angeles, the sites of the individual-level

MIP data. In both areas, there is a similar persistence of concentrated-poverty neighborhoods (the first quintile group of ICE), at over 70 percent. As with the United States as a whole, relatively few neighborhoods upgrade from the bottom two quintiles to above the 60th percentile—"stickiness" is the general rule, particularly at the extremes of the distribution. Somewhat surprisingly, these inertial tendencies are even stronger at the neighborhood level in Los Angeles than what many consider the epitome of neighborhood inequality in Chicago. For example, 77 percent of Chicago neighborhoods in the top quintile remained in place between 2000 and 2010 (the midpoint of the 2008–12 ACS), whereas in Los Angeles the persistence rate reached 87 percent among the highest quintile neighborhoods. Neighborhood inequality in Los Angeles thus appears more rigid in comparison to Chicago and to the United States as a whole (Sampson et al. 2015b), a pattern that is also seen in figure 1, which plots pre- and post-Recession ICE values.

There is more fluidity in the middle of the income distribution in both cities compared to the United States. In Chicago, only 37 percent of neighborhoods remained mixed- to middle-income over the decade, and approximately 45 percent of mixed- to middle-income neighborhoods lost ground over the decade. Los Angeles neighborhoods show a somewhat different pattern, where the mixed- to middle-income category has a persistence rate of 47 percent and more of the middle moved up than lost ground. Overall, though, especially including the decade of the 1990s, middle-income neighborhoods are tenuous, showing more fragility and hollowing out (Sampson et al. 2015b). The basic picture, then, is one of rigidity at the extremes and vulnerability or precariousness in the middle.

Individual-Level Transitions

This section shifts from the neighborhood to the individual as primary unit of analysis but retains the analytic focus on change. Do individuals remain within their initial neighborhood income status, or is there substantial upward and downward mobility over the course of the study? Table 3 shows the transition matrix of individual exposure to neighborhood income environments (ICE) over a 13-year period (2000 to 2013) in the LAFANS-MIP sample of adults, and over 18 years for the transition to young adulthood in Chicago. Parallel to the previous analyses, neighborhood ICE and income measures are based on nationally determined quintiles.[4]

The data reveal that there is more mobility of individuals across neighborhood income groups than there is change in neighborhoods over time for both

4 All estimates employ analytic weights to correct for the stratified sample design and potential attrition bias over the course of the follow-up. For further details and results, see Sampson et al. (2015a,b).

Table 1. Neighborhood-level mobility in median family income, 1990 to 2000 and 2000 to 2008–12: United States, excluding Puerto Rico

A.		1990 MEDIAN FAMILY INCOME QUINTILES					
		1	2	3	4	5	TOTAL
2000 income quintiles	1	8,059	1,856	193	25	4	10,137
		80.15	18.36	1.91	0.25	0.04	20.06
	2	1,747	5,700	2,344	343	21	10,155
		17.37	56.39	23.14	3.39	0.21	20.09
	3	181	2,237	5,315	2,270	151	10,154
		1.80	22.13	52.48	22.41	1.49	20.09
	4	50	252	2,099	5,908	1,774	10,083
		0.50	2.49	20.72	58.33	17.53	19.95
	5	18	63	177	1,582	8,172	10,012
		0.18	0.62	1.75	15.62	80.74	19.81
Total		10,055	10,108	10,128	10,128	10,122	50,541
		100	100	100	100	100	100

B.		2000 MEDIAN FAMILY INCOME QUINTILES					
		1	2	3	4	5	TOTAL
2008–12 income quintiles	1	7,727	2,124	249	28	5	10,133
		76.26	20.96	2.46	0.28	0.05	19.96
	2	1,943	5,287	2,584	338	12	10,164
		19.12	52.02	25.42	3.33	0.12	20.02
	3	311	2,303	4,992	2,395	159	10,160
		3.06	22.67	49.13	23.57	1.56	20.01
	4	79	342	2,116	5,779	1,851	10,167
		0.78	3.36	20.81	56.84	18.20	20.03
	5	45	103	218	1,628	8,145	10,139
		0.44	1.02	2.15	16.06	80.07	19.97
Total		10,105	10,159	10,159	10,168	10,172	50,763
		100	100	100	100	100	100

Note: Cell entries are the number of cases and column percent, respectively; only census tracts with family populations above 50 in 1990 (N=50,667), 2000 (N=50,887) and 2008–12 (N=50,959) are included.

Table 2. Neighborhood-level mobility in ICE (index of concentrated extremes), 1990 to 2000 and 2000 to 2008–12: United States, excluding Puerto Rico

A.		1990 MEDIAN FAMILY INCOME QUINTILES					
		1	2	3	4	5	TOTAL
2000 ICE quintiles	1	8,134	1,821	164	20	3	10,142
		80.81	18.00	1.62	0.20	0.03	20.07
	2	1,729	5,800	2,312	300	19	10,160
		17.18	57.34	22.86	2.96	0.19	20.10
	3	158	2,219	5,347	2,270	146	10,140
		1.57	21.94	52.86	22.43	1.44	20.06
	4	32	225	2,125	5,880	1,828	10,090
		0.32	2.22	21.01	58.10	18.06	19.96
	5	13	50	167	1,651	8,128	10,009
		0.13	0.49	1.65	16.31	80.28	19.80
Total		10,066	10,115	10,115	10,121	10,124	50,541
		100	100	100	100	100	100

B.		2000 MEDIAN FAMILY INCOME QUINTILES					
		1	2	3	4	5	TOTAL
2008–12 ICE quintiles	1	7,799	2,091	232	17	3	10,142
		77.13	20.58	2.28	0.17	0.03	19.98
	2	1,908	5,411	2,515	317	9	10,160
		18.87	53.27	24.75	3.12	0.09	20.01
	3	292	2,292	5,096	2,355	125	10,160
		2.89	22.56	50.14	23.18	1.23	20.01
	4	91	303	2,132	5,788	1,845	10,159
		0.90	2.98	20.98	56.97	18.14	20.01
	5	21	61	188	1,683	8,189	10,142
		0.21	0.60	1.85	16.56	80.51	19.98
Total		10,111	10,158	10,163	10,160	10,171	50,763
		100	100	100	100	100	100

Note: Cell entries are the number of cases and column percent, respectively; only census tracts with family populations above 50 in 1990 (N=50,667), 2000 (N=50,887) and 2008–12 (N=50,959) are included.

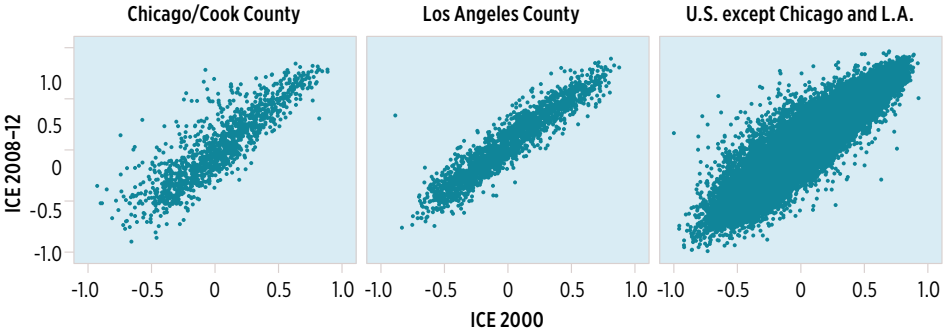
Table 3. Individual-level transitions in exposure to income extremes (ICE), Chicago (1995–2013) and Los Angeles MIP samples (2000 to 2013)

A.		CHICAGO WAVE 1 ICE QUINTILES					
		1	2	3	4	5	TOTAL
Wave 4 ICE quintiles	1	140	50	30	6	4	229
		60.56	34.42	18.89	5.66	11.08	34.14
	2	53	35	46	18	2	155
		23.17	24.36	29.27	17.5	6.24	23.06
	3	23	36	33	15	3	109
		9.96	24.65	20.76	14.79	7.76	16.27
	4	9	14	26	35	12	97
		3.99	9.73	16.69	34.61	33.53	14.46
	5	5	10	23	28	15	81
		2.32	6.84	14.39	27.45	41.39	12.07
Total		231	145	157	101	37	671
		100	100	100	100	100	100

B.		LOS ANGELES WAVE 1 ICE QUINTILES					
		1	2	3	4	5	TOTAL
Wave 3 ICE quintiles	1	112	13	1	2	0	128
		59.98	12.02	1.36	3.04	0.00	21.00
	2	38	73	29	11	9	160
		20.17	65.50	33.50	14.85	6.08	26.18
	3	23	20	33	10	3	88
		12.11	17.51	37.89	13.75	2.07	14.44
	4	12	2	23	32	40	109
		6.48	2.04	26.35	42.48	26.25	17.84
	5	2	3	1	20	100	126
		1.26	2.94	0.91	25.89	65.60	20.55
Total		186	112	86	76	152	612
		100	100	100	100	100	100

Note: Cell entries are the number of cases and column percent, respectively.
Source: Panel A is reproduced from Sampson, Mare, and Perkins (2015) and Panel B is reproduced from Sampson, Schachner, and Mare (2015).

Figure 1. Relationship pre- and post-recession for ICE (index of concentrated extremes in income): Chicago/ Cook County, Los Angeles County, and the United States, excluding Puerto Rico, 2000 to 2008/2012



Chicago and Los Angeles. Yet there are distinct patterns of stability and change, with some unexpected patterns. For younger adults in Chicago, for example, there is more downward mobility and more individuals in the lower quintile group compared to Los Angeles. Even so, almost 75 percent of adolescents in Chicago who grew up in the highest-income neighborhoods (the top fifth) remained either at the top or in the second-highest income group. The basic message is that retention of neighborhood income status is considerable even for the highly mobile and unstable period of young adulthood. Indeed, only 11 percent of the Chicago sample starting out with advantage is downwardly mobile in the sense of ending up in the lowest quintile. In Los Angeles, a remarkable 90 percent of middle-adulthood respondents who lived in upper-income neighborhoods stayed at or near the top. At the other end of the distribution, remaining in poverty is also similar and substantial in both cities despite the age and follow-up differential: 60 percent of individuals in both Los Angeles and Chicago were in the bottom quintile of neighborhood ICE at the beginning and end of the study. And in both cities, fewer than 3 percent of individuals in the bottom neighborhood-income group climbed to the top by the end of the follow-up; under 10 percent rose to the fourth income group.

Moreover, in both cities, and similar to the neighborhood-level findings, fluidity in the middle of the income distribution is common. Less than a quarter of young adults in Chicago and 38 percent of adults in Los Angeles lived in the middle-income category at both time points, and in both cities a significant proportion of those starting out in mixed- to middle-income neighborhoods lost ground—over a third in Los Angeles and almost half in Chicago. Similar results

were obtained for mobility across median income groups, although there is more downward mobility for adolescents in Chicago. Despite the vast differences in the life cycle of the samples and urban structure between Los Angeles and Chicago, the data reinforce a common picture of persistence at the extremes and fluidity in mixed- to middle-income residential exposure at the individual level.

Individual Differences and Contextual Mobility

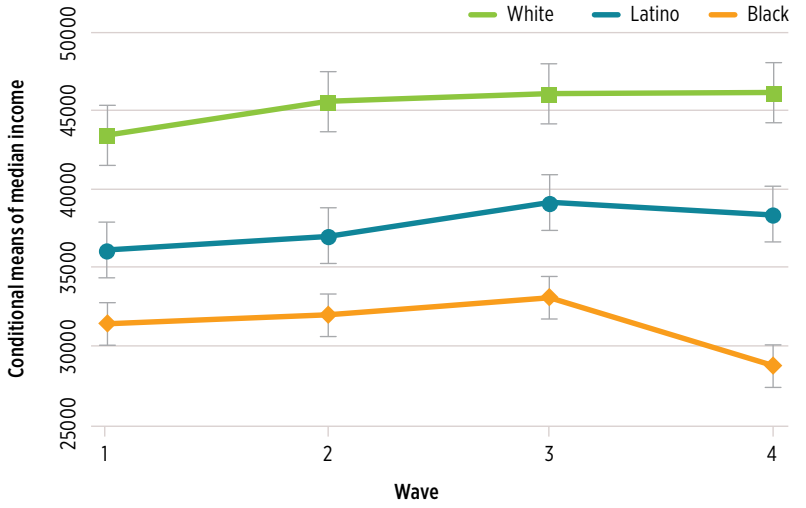
The findings to this point underscore the spatial persistence of neighborhood inequality, but a set of critical questions remains for the goal of better linking neighborhood and individual life-course processes of economic mobility. Do the background characteristics or changing life circumstances of individuals alter trajectories of neighborhood economic status? As noted in the introduction, there are strong theoretical reasons to expect that class, educational, and family factors explain who ends up in poor or rich neighborhoods and may therefore alter pathways of contextual mobility. Residential mobility is also a factor of theoretical relevance: does accounting for movers and stayers alter the inertial tendencies observed thus far?

Another critical question given past research is how economic mobility patterns differ by race and ethnicity. In particular, we know that blacks and whites live in different neighborhood environments (Sampson 2012; Sharkey 2013), but much less about whether background or life-course characteristics explain the differential exposure to neighborhood inequality over the life course and against the backdrop of the Great Recession. We also know very little about Latino trajectories of exposure to different income environments over the life course.

This section addresses these questions by examining trajectories of neighborhood income exposure in both Chicago and Los Angeles. A series of models are analogous in specification, bearing in mind the life-stage differences of adolescents in Chicago and middle-age adults in Los Angeles. For each site, mixed-effect regression models of time-varying median income and ICE are estimated by race/ethnicity that control for the person-specific characteristic of age, sex, and length of residence in neighborhood at baseline, in addition to residential mobility over time.[5] A set of background characteristics assessed at

5 Specifically, mixed-effect or hierarchical linear models are estimated that account for moving across tracts, a within-person error term, and a person-specific error term. Later Chicago analysis expands residential mobility to adjust for both moving across tracts and moving out of the city of Chicago over the course of the follow-up. LAFANS analysis also controls for moving across tracts, but the Los Angeles vs. county distinction is not comparable to the Chicago sample, so later models control for moving out of the central core of Los Angeles instead. For discussion of mover-stayer results see Sampson et al. (2015b).

Figure 2. Chicago median-income trajectories of young adulthood MIP sample by race/ethnicity, adjusting for age, sex, length of residence, residential mobility, immigrant generation, education, employment, family income, HH size, homeowner, and marital status (95 percent CI)

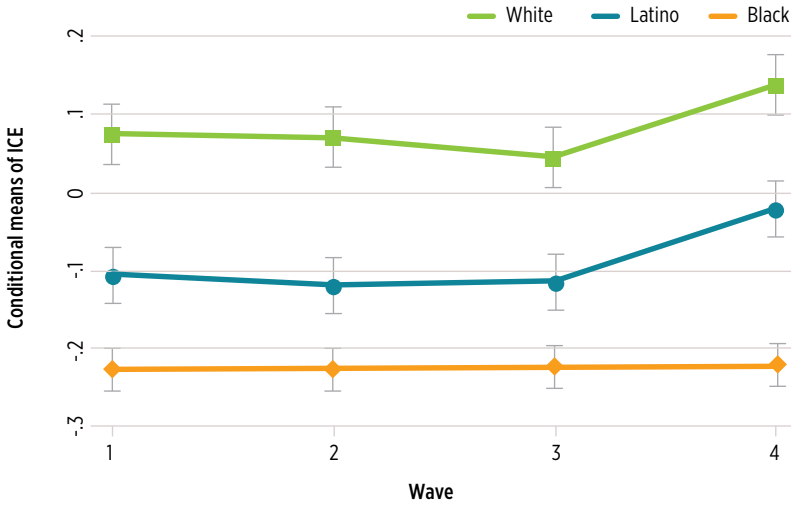


wave 1 referring to the parents of the Chicago adolescences and the adults in Los Angeles control for

- immigrant generation (first- and second-generation),
- education,
- employment,
- family income,
- household size,
- home ownership, and
- marital status.

For example, family income in Chicago means the income of the family of origin at wave 1 for the adolescents (ages 9–12). In Los Angeles, family income refers to the person him or herself plus other family members at wave 1.

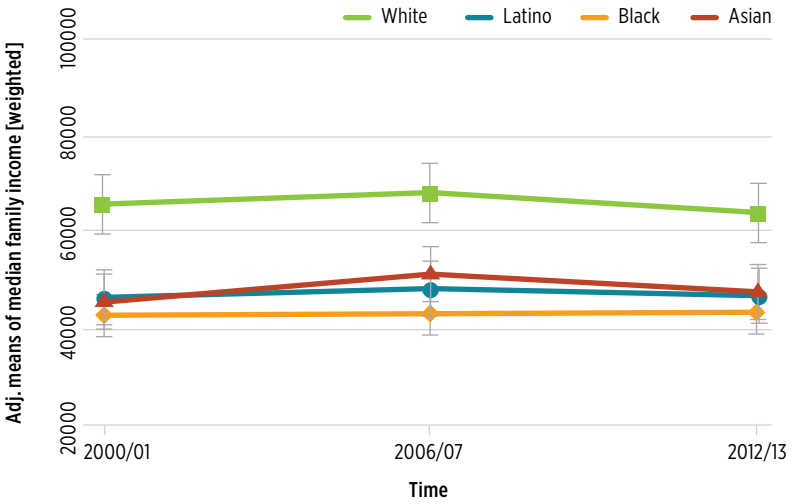
Figure 3. Chicago ICE trajectories of young adulthood MIP sample by race/ethnicity, adjusting for age, sex, length of residence, residential mobility, immigrant generation, education, employment, family income, HH size, homeowner, and marital status (95 percent CI)



This analytic strategy allows for questioning how Chicago adolescents fare in neighborhood economic mobility during the transition to young adulthood, adjusting for major differences in family social origins (see Hout 2015) and residential mobility. In Los Angeles, the strategy allows for questioning whether how well middle-age adults fare is conditional on their status in younger adulthood at the point where the Chicago sample leaves off (age 28 on average) and their later residential mobility. Overall, this strategy thus permits a cross-cohort look at individual and neighborhood economic mobility, with a focus on pre- and post-Great Recession outcomes by race/ethnic inequality.

The results in figures 2 to 5 paint a clear picture. Despite differences in age cohort, length of follow-up period, and measurement differences, a major finding is that white privilege in neighborhood status is maintained after controlling for the classic mobility-related features of individual background and residential mobility, in addition to the macro effects of the Great Recession. Whites enjoy a substantial advantage when it comes to neighborhood

Figure 4. Los Angeles median-income trajectories of middle adulthood MIP sample by race/ethnicity, adjusting for age, sex, length of residence, residential mobility, immigrant generation, education, employment, family income, HH size, homeowner, and marital status (95 percent CI)

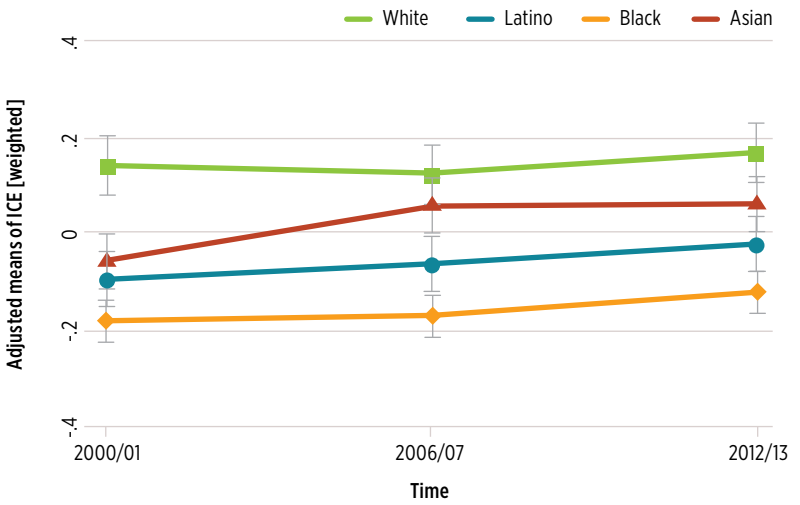


economic status, with a dollar difference compared to blacks of at least $15,000 in median income in each city and a gap in ICE scores of over a standard deviation in Chicago and nearly a standard deviation in Los Angeles. In Chicago, black adolescents also appear particularly hard hit by the Great Recession. The decline in neighborhood income for blacks compared to whites from wave 3 to wave 4 is statistically significant and amounts to nearly $5,000 (figure 2); by contrast, whites were impervious to the shock of the recession and the slight decline for Latinos is not significant.[6] At the upper end, white and Latino adolescents increased their exposure to concentrated affluence from wave 3 to wave 4, but the ICE value for blacks remained flat (figure 3).

Adults in Los Angeles are better off overall than young adults in Chicago with respect to average neighborhood income and concentrated affluence (figures 4–5), and they were seemingly unaffected by the Great Recession. But this

6 Further analysis by Perkins and Sampson (2015) reveals that increases in neighborhood poverty among non-poor blacks between wave 3 (ending by 2002) and wave 4 (ending in 2013) occur primarily after the Great Recession, not between 2002 and 2007.

Figure 5. Los Angeles ICE trajectories of middle adulthood MIP sample by race/ethnicity, adjusting for age, sex, length of residence, residential mobility, immigrant generation, education, employment, family income, HH size, homeowner, and marital status (95 percent CI)



pattern is somewhat expected because adults have had a longer time to advance in their careers and have more resources than adolescents to cushion against the recession. Note, too, that Latinos in Los Angeles are closer to blacks in their contextual mobility trajectories, and that Asians, while a relatively small group, fare quite well compared to whites in neighborhood economic status. Still, the white-black gap is large in both cities and cannot be explained away in terms of background characteristics.

Moving Up?

The question of upward mobility has generated intense debate in the United States of late, but largely in terms of individual income changes across generations (Chetty et al. 2014b). Contrasting questions of what the legacy of initial neighborhood poverty is and what factors predict changes in contextual economic mobility can be answered by estimating the linear change in median income and ICE from origin to destination in addition to logistic regression

models of movement from the lower quintile of neighborhood income and ICE at the upper quintile.

There is evidence of the path dependence of initial neighborhood economic level—where you end up living is contextually shaped. Conditional on starting position, blacks continue to see large deficits in the odds of upward mobility despite controlling for social and residential mobility. Moreover, individual differences play a subdued role once initial conditions are controlled; in Chicago, none of the background or individual social origin predictors attain significance in the transition to young adulthood (e.g., parental income, education, household size, immigrant status, and even residential mobility). For adults in Los Angeles, higher income respondents do see a boost in neighborhood incomes, and factors such as homeownership and marital status play a role, but overall the driving factors are initial position and race/ethnicity.

Figure 6 summarizes selected results for linear models of median income where a dollar value can be attached to race/ethnic categories and prior neighborhood status. The data reveal an interesting city pattern consistent with the idea that the black "penalty" for changes in neighborhood income status over time is larger in Chicago than in Los Angeles by a considerable degree. Adjusting for wave 1 neighborhood income and the usual suspects that are posited in prior research to account for income mobility, black young adults in Chicago live in neighborhoods that are on average over $19,000 lower in median income than white young adults as of 2013, whereas in Los Angeles, the gap for middle-aged adults is also significant but much less, about $7,500. Although age or life-cycle may account for the difference in part, the differential black-white gap is likely driven by the structural reality of severe and enduring racial segregation in Chicago for much of its history (Massey and Denton 1993; Sampson 2012).[7]

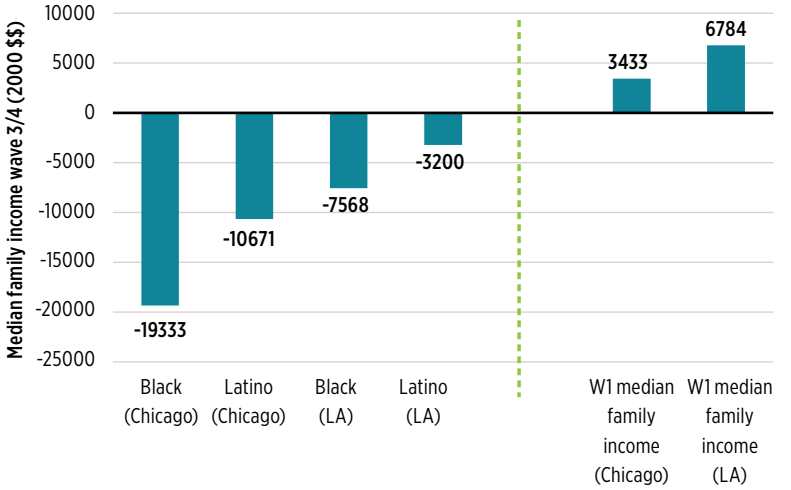
In addition, Los Angeles residents reap a greater benefit than Chicagoans on initial neighborhood position. For every $10,000 in neighborhood income at baseline, L.A. adults get a later return of more than $6,700, compared to $3,433 in Chicago. The follow-up is longer in Chicago (1995–2012), but when the model is revised to examine the period 2000 to 2012, insuring an exact time frame for comparison, the estimate for Chicago is just under $3,000, or less than half that of Los Angeles. The basic result thus holds.

Summary and Policy Implications

The results of this paper militate against the idea that neighborhood income inequality is somehow recent or that neighborhoods have radically repositioned

7 Further analysis shows that the strong black-white gap is obtained for the caretakers of the birth cohort who are similar in age to the LAFANS adults.

Figure 6. Selected coefficients predicting neighborhood median income of MIP respondents in 2012 (wave 3 Los Angeles and wave 4 Chicago). Adjusted for age, race, sex, length of residence, residential mobility (including out of Chicago/Central L.A.) and baseline family income, neighborhood income, education, HH size, homeowner, employment, and marital status



Note: The coefficients on Wave 1 Median Family Income have been re-scaled by 10,000. For the Chicago sample, baseline socio-economic covariates refer to the caregiver (e.g., marital status) or family (e.g., income), given the young age of respondents at the beginning of the panel. The Los Angeles data on middle-age adults pertain to the respondent or his or her family. Median neighborhood income at final wave is in 2000 dollars.

themselves. Just as individual income mobility has been fairly low for some time (Chetty et al. 2014b), the odds of neighborhood-level upgrading are relatively low and persistent neighborhood inequality has existed for decades. It is true that some cities have changed dramatically and that the middle class is in peril, but large-scale secular changes have been, for the most part, superimposed on preexisting structures of inequality. These structures exist nationally and in both cities studied, although the persistence of concentrated extremes is as high or higher in the newer sunbelt city of Los Angeles than in the older city of Chicago that is typically considered more divided by place.

At the individual level, the results show greater change, or contextual mobility, but persistence still dominates. Retention of neighborhood income status is considerable even during the highly mobile and unstable transition to young adulthood; in Chicago, only about a tenth of adolescents experienced downward mobility into their 30s. In Los Angeles the retention of privilege is even greater; 90 percent of adult respondents who lived in upper-income neighborhoods stayed at or near the top. At the other end of the distribution, the prevalence of those remaining in poverty is also similar and substantial in both cities despite the age difference and follow-up differential. For example, in both cities, fewer than 10 percent of individuals in the bottom neighborhood-income group climbed to the top by the end of the follow-up.

Perhaps the most troubling finding is the pronounced magnitude of racial inequality in neighborhood economic status and contextual mobility. Whites enjoy a substantial advantage, at least $12,000 more in neighborhood income than blacks in each city at each wave, and a gap in ICE scores of over a standard deviation in Chicago and nearly a standard deviation in Los Angeles. Further analysis shows that patterns are similar for all age cohorts, suggesting that these findings are not developmental in nature. When examining change models by controlling for baseline neighborhood income status, blacks end up in destination neighborhoods with about $19,000 lower median income than whites in Chicago and almost $8,000 lower in Los Angeles (figure 6). In both cities, initial conditions in median income also directly predict destination median income. These findings underscore the path dependence of living in neighborhood poverty and the significant racial penalty that blacks in Chicago and Los Angeles pay.

Do changes in life circumstances materially alter the basic patterns in the data that have been presented here? Perhaps surprisingly, a direct assessment of both residential and social mobility (e.g., increases in income or education, marital changes, and employment transitions) does *not* change the fundamental inequalities shown in figures 4 and 5 for Los Angeles (Sampson et al. 2015b). Moreover, Perkins and Sampson (2015) find that racial differences in neighborhood exposure to poverty are so strong that even *high-income* blacks are exposed to greater neighborhood poverty than *low-income* whites. For example, nonpoor blacks in Chicago live in neighborhoods that are nearly 30 percent in poverty—traditionally the definition of "concentrated poverty" areas—whereas poor whites lives in neighborhoods with 15 percent poverty, about the national average. A substantial minority of blacks in Chicago (about 18 percent) also experienced living in poor neighborhoods *and* living in individual poverty at the same time by the end of our study—what can be called "compounded deprivation" (Perkins and Sampson 2015)—compared to only a handful of whites (less than 1 percent). This large difference remains after controlling for anxiety/

depression, self-control, delinquency, and cognitive skills of the respondent, along with exposure to violence in the community and family criminality. It is thus clear that for blacks in particular, whether in Los Angeles or Chicago, the social realities of poverty are spatially constricted in a strong and persistent way, even when accounting for individual residential and social mobility, and, in Chicago, for the foundations of human capital development (Heckman 2006).

Affirmative Action for Neighborhoods?

The results of this paper imply that a singular focus on individual income mobility is misleading. It is not that individual mobility is unimportant, but that neighborhood mobility has its own logic and demands independent inquiry. The spatial foundations of inequality further imply that policies should aim to change where individuals live or change the neighborhoods themselves.[8]

The person-based approach to reducing spatial inequality focuses on individual residential mobility—attempting to move individuals out of poor communities and into middle-class or even rich areas. A prominent strategy is to give housing vouchers to induce residents to move away from areas of concentrated poverty, as occurred in the MTO experiment.[9] The front-page headline in the *New York Times* reporting long-term results on the MTO study and another study on moving across neighborhoods laid bare the dominant policy takeaway: "Change of Address Offers a Pathway out of Poverty" (May 4, 2015)—the "move out" approach.

Instead of moving out, the goal of place-based interventions is to intervene holistically at the community level and renew the existing but disinvested and often troubled neighborhoods in which the poor live with an infusion of new resources. When poor individuals are asked about problems in their communities or why they want to move, the answers turn on issues like getting away from violence, drugs, gangs, and poor performing schools (Wilson and Mast 2014). Logically, this finding suggests that what poor residents want in their neighborhoods is what everyone wants, and that living among the poor is seen as a problem by residents only insofar as it means the denial of valued resources, like safety and quality education.[10] In theory at least, people can stay in place at the community level but still "move up" or realize improved lives and access to resources through place-based intervention.

8 The ideas in this section were introduced in the essay, "Move Up or Out? Confronting Compounded Deprivation," The Dream Revisited Blog, New York University, Furman Center.

9 Another variant is to tear down poor communities and disperse residents, as occurred in the Robert Taylor Homes or Cabrini Green projects in Chicago.

10 For a similar argument about racial segregation, see Pattillo (2014).

Person-based versus place-based interventions have been the subject of much debate that goes well beyond the scope of this paper, but a concise summary is that there is no "magic bullet" intervention at either level (e.g., Ellen and Turner 1997; Galster 2011; Sharkey 2014). Voucher programs like MTO have shown some positive effects, but the evidence is still uncertain overall. It is also not clear that scaling up voucher programs to the national level is feasible—can the nation afford to move tens of millions of residents? And what if concentrated poverty is shifted to other locations when mobility programs are scaled up (Sampson 2012, 380–82)? Meanwhile, community-level interventions have produced uneven evaluation results and, while neighborhood income-mixing has surfaced as a favored policy tool, research is sparse and has produced conflicting results (Joseph and Chaskin 2012).

Although both person- and place-based interventions have a mixed record of success, the data on persistent inequality points to the need for creative thinking on sustained interventions. In particular, it is surprising how few neighborhood policies take the long view; most interventions are single-site or time-constrained with outcomes measured locally and in the short run. As Sharkey (2013, 179; 2014) has argued, there is a need for durable investments in disadvantaged urban neighborhoods to match the persistent and longstanding nature of institutional disinvestment that such neighborhoods have endured over many years. Several strategies exist to improve communities that are logical candidates for retooling with an emphasis on sustained investment. Candidates include

- violence reduction integrated with community policing and prisoner reentry programs that foster the legitimacy of criminal justice institutions;
- integrated community-based social services that recognize the multidimensional nature of poverty;
- code enforcement and crackdown on landlord disrepair and illegal eviction practices;
- enhanced protections against housing discrimination; and
- educational reform and support for healthy child development in high-risk, poor communities.

Federal interventions in many cities, such as Choice Neighborhoods and Promise Neighborhoods, are to date relatively small-scale and unevaluated, but they too may prove useful in informing the next generation of place-based interventions. Hybrid interventions that seek to create a more

equitable mix of incomes, such as the HOPE VI mixed-income intervention, also make logical sense.[11]

A policy option that combines a person- and place-based approach is to give cash assistance or reduce the tax rate for those in compounded deprivation (Perkins and Sampson 2015)—that is, poor residents who also live in poor or historically disinvested areas. Cash assistance or tax relief (e.g., along the lines of a negative income tax) could also be combined with job training or public works job creation. The logic behind this idea is that poor individuals who have lived for an extended period in poor neighborhoods have accumulated a set of disadvantages very different than poor individuals who have otherwise been surrounded by the resources of better-off neighborhoods (see also Wilson 1987).

Racial inequality cannot be set aside in this discussion. African Americans, more than whites or Latinos, have historically borne the brunt of differential exposure to compounded deprivation, and the data presented in this paper show that this continues to the present day. These challenges could be addressed, and communities potentially preserved, even with a policy targeted at all qualified persons regardless of race. The ecological impact would disproportionately benefit minorities, and, unlike MTO-like voucher programs, such a policy would allow poor residents to remain in place, if desired, while at the same time increasing their available income. Extra income would, in effect, lower the neighborhood poverty rate and, in theory, lead to longer-run social investments in the community among stayers. Length-of-residence requirements could be imposed to counteract attempts to exploit the system by in-movers, and incentives to move could remain an alternative for residents wishing to leave.

Regardless of the specific initiative, there are encouraging trends that give hope to the idea that revitalizing disadvantaged communities through place-based interventions and person-based income, tax, or job policies is not naïve. For one thing, contrary to stereotypes, disadvantaged communities have latent collective efficacy (e.g., organizational capacities; reservoirs of informal social control) that are otherwise suppressed by the cumulative disadvantages built up after repeated everyday challenges (Sampson 2012, 394–413). The further good news is that some of the challenges that have accrued to disadvantaged communities have abated. Violence is down dramatically in most cities, people are moving back to cities, racial segregation is moderating, and immigration has revitalized many neighborhoods across the country (Sampson 2015). Taken together, these facts suggest real prospects for the increased integration of neighborhoods across race and class boundaries in urban areas that not too long ago were written off or were thought to be dying (Ellen 2000). These trends also raise the possibility that, with sustained policy

11 For a description of these and other mixed-income and neighborhood-level interventions, see Chaskin and Joseph (2015).

interventions, the black-white gap in community resources that has dominated the urban scene for so long may decline.

In conclusion, the ultimate consensus goal is to break the longstanding link in American society between neighborhood of residence and the deprivation of essential resources. There is nothing intrinsic about policy to prevent intervening at the scale of the community to accomplish this goal while attending to the realities of individual choice. Voucher policies remain important and should be improved, but the persistence of neighborhood inequality demands that we simultaneously invest in sustained place-based interventions that give poor individuals a chance, if desired, to "move up" in place. How best to combine person- and place-based interventions is therefore a key policy challenge for the future. ■

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Can Schools Level the Intergenerational Playing Field? Lessons from Equal Educational Opportunity Policies

RUCKER C. JOHNSON
University of California, Berkeley

This paper builds on prior joint work with Kirabo Jackson and Claudia Persico (Northwestern University). Please direct correspondence to Rucker Johnson, University of California, Berkeley, Goldman School of Public Policy, 2607 Hearst Avenue, Berkeley, CA, 94547, or e-mail to ***ruckerj@berkeley.edu****.*
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Introduction

One of the longstanding missions of U.S. public education is to promote equality of opportunity. The question is, *"Are we there yet?"* Access to quality schools and educational resources for children are key engines of upward mobility in the United States, holding the potential to break the cycle of poverty from one generation to the next. Over the past several years, our leading national newspapers—*The New York Times, The Wall Street Journal, The Washington Post, The Los Angeles Times*—have each independently published a series of articles on mobility in the United States, describing and questioning its fluidity as a reality or an American dream deferred. While the shared values of an equitable structure of opportunity are deeply embedded in public consciousness, there remains ongoing debate regarding the underlying determinants of mobility and how it relates to notions of equity.

Recent research has shown that intergenerational mobility is much lower in the United States than previously assumed (Chetty et al. 2014; Mazumder 2005; Solon 1992), is significantly less than many other advanced developed countries (Jäntti et al. 2006), and black children experience significantly lower rates of upward mobility conditional on their parents' positions in the family income distribution (Bhattacharya and Mazumder 2011; Hertz 2005). Moreover, there is a high degree of persistence in economic status across generations in the United States, particularly in the lower and upper tails of the income distribution. What are the main transmission mechanisms of intergenerational mobility, and where does one look for the early developmental origins of inequality in life outcomes? Various dimensions of inequality in adulthood are rooted in childhood conditions, wherein schools play a pivotal role in either reinforcing or mitigating the intergenerational reproduction of socioeconomic advantage (Card and Krueger 1992). Residential segregation by race and class that leads to unequal access to quality schools is often cited as a culprit in perpetuating inequality in attainment outcomes. However, the role of school quality factors in contributing to the intergenerational persistence of economic status, and in being a source of racial differences in rates of intergenerational mobility, have received little attention in the literature.

The nature and amount of public investment in children has changed substantially during the post-World War II era. The major thrust of policies aimed at equality of opportunity over this period has been intended to ensure educational access to quality resources K–12 and beyond, and more recently greater investments in pre-school years. Over the past five decades, three major government interventions have had substantial impacts on the provision of school resources and have narrowed black-white differences in access to dimensions of school quality:

1. court-mandated school desegregation
2. state legislation and legal action aimed to change the distribution and level of school funding
3. the expansion of targeted early childhood pre-school programs for disadvantaged children through Head Start

This paper draws on recent research on the long-run impacts of school desegregation (Johnson 2015), effects of school finance reform-induced increases in school spending (Jackson, Johnson, and Persico 2015), and evidence on the long-run effects of Head Start (Johnson and Jackson 2015), and combines them with a focus on these three major school reforms' impacts on intergenerational mobility. It focuses on how school quality factors contribute to the intergenerational persistence of economic status and are a source of racial differences in rates of intergenerational mobility. The collective evidence from the roll-out of desegregation implementation, school finance reforms, and expansions of early childhood education programs is strong in providing a testbed for the study of the efficacy of the first-generation suite of equal education policy reforms. This paper explores the mechanisms that tie childhood school-level factors to aggregate mobility rates.

Court-ordered school desegregation has been described as the most controversial and ambitious social experiment of the past 60 years. Despite the magnitude of these changes, no large-scale data collection effort was undertaken to investigate school desegregation program effects, particularly on longer-run outcomes. Before the study by Johnson (2015), there were no quasi-experimental studies of the impacts of desegregation that had followed students over a long horizon beyond their early 20s. While many prior studies have examined effects of school resources on test scores and more proximate student achievement outcomes, less evidence is available on how school spending influences intergenerational mobility (Jackson, Johnson, and Persico 2015, a notable exception). Similarly, controversy about whether Head Start produces lasting benefits in practice has surrounded the program since its inception.

In parallel literature, there is an impressive body of evidence on the measurement of intergenerational mobility and the extent of mobility for different countries and over time (Bjorklund and Jäntti 1997; Solon 1992). However, little is known about the precise mechanisms underlying the persistence of economic status across generations; identifying what factors inhibit or facilitate upward mobility for those born into humble beginnings has remained illusive. Identifying the major factors and pathways that lead to economic (im)mobility is important for the optimal design of education policies and implementation of effective childhood interventions to promote greater equality of opportunity. There is currently a paucity of direct evidence from the United States on the effects of school quality on intergenerational income mobility.

This paper extends two branches of literature on economic mobility:

1. the relationship between school resources/quality and socioeconomic success

2. racial inequality in adult socioeconomic attainment outcomes that are rooted in childhood conditions

At the nexus of these two literatures, this paper examines the role of school quality as the key propeller of upward mobility. An important contribution of this work is that it uncovers sources and identifies mechanisms underlying generational mobility, integrating the analysis of the linkages between educational investment opportunities across the continuum of developmental stages of childhood—including pre-school program participation and K–12 school resources—to investigate their long-run consequences on the extent of intergenerational mobility.

The persistent residential segregation of poor and minority populations coupled with the heavy reliance on local property taxes to fund K–12 schools, often leads to disparities in school resources. In light of this, this paper investigates the extent to which patterns of segregation influence whether schools weaken or reinforce the role of family background in determining children's outcomes and compares the intergenerational mobility rates across communities and time periods with differing access to educational opportunities and school quality, separately by race. In this way, this analysis considers a narrower slice of the broader question of how where you live influences life chances and economic success.

This investigation requires not only a convincing research design to address concerns about endogeneity bias but also requires high quality income data spanning multiple years of adulthood for two generations of the same set of families. This study combines high-quality intergenerational income data with compelling research designs to identify the causal effects of school desegregation, school spending, and Head Start, respectively.

The study analyzes the economic status trajectories of children born between 1945 and 1979 followed through 2013 using data from the Panel Study of Income Dynamics (PSID) and its supplements on early childhood education, where the data have been geocoded to the census block level. This intergenerational microdata set is linked with administrative data on school district per-pupil spending, Head Start per capita spending, and comprehensive case inventories on the timing and type of court-ordered school desegregation and school finance reforms spanning the period 1965–2010. Thus, this analysis uses the longest-running U.S. nationally representative longitudinal data spanning four decades linked with multiple data sources containing detailed neighborhood attributes and school quality resources that prevailed at the time these children were growing up.

A sharp increase in generational income mobility among African Americans among successive birth cohorts born between 1955 and 1979 shows its relatedness to dimensions of access to school quality. The study explains black-white differences in upward mobility and its subsequent convergence among successive cohorts born between 1955 and 1979 with a focus on the role of school quality. The study analyzes the effects of the court-ordered desegregation plans of public schools, implemented in the 1960s, '70s, and '80s, and subsequent court-ordered school finance reforms that accelerated during the 1980s and '90s on the extent of intergenerational mobility. The wide variation in the timing of implementation of desegregation plans and school funding formula changes is exploited to identify their effects. Using policy-induced changes in school spending (school resource inputs) across cohorts within the same district and across different districts from the same cohort is used to estimate the impact of school spending on socioeconomic status attainments.

Consistent evidence demonstrates that low-income and minority students experienced both larger reform-induced increases in school spending (access to school resource inputs) and larger resultant impacts of a given change in spending on long-term outcomes. African Americans who grew up following school desegregation implementation, and poor children following court-ordered school finance reforms, were more likely to occupy a higher position in the income distribution than their parents, and distances moved across the distribution were greater, relative to those experienced for prior birth cohorts who were 18 or older at the time of their schools desegregation implementation or imposition of school finance reforms. The results highlight the role of childhood school quality in contributing to (and subsequently narrowing) racial differences in intergenerational mobility.

Extending Previous Work

Background on Desegregation

Residential segregation may affect access to quality schools and subsequent mobility prospects through its effects on school resources (e.g., school district per-pupil spending, class size, teacher quality). During the 1950s, '60s, and '70s when a majority of the individuals in the PSID sample were school-age, there was substantial variation across districts in school quality inputs (e.g., per-pupil spending, pupil-to-teacher ratio), which was generated by limited state support for K–12 education in the vast majority of states and a heavy reliance on local property taxes. During the 1960s and '70s, states, on average, contributed roughly 40 percent of the cost of K–12 education, and much of this aid was a flat per-pupil payment that was not related to local property wealth of the district (U.S. Department of Education 2001).

While the premise of *Brown v. Board of Education of Topeka* was "separate is inherently unequal," the decision alone was not sufficient to compel school districts to integrate.[1] Minimal school desegregation occurred in the 1950s and early 1960s following the *Brown I* and *II* rulings issued in 1954 and 1955.[2]

As seen most notably in the South, racial disparities in school resources were compounded by racial school segregation within districts prior to the enactment of desegregation plans. Before school desegregation plans were enacted, school district spending was directed disproportionately to the majority-white schools within districts (Johnson 2015; Cascio et al. 2010). School desegregation did not begin in earnest in the South until after 1964, and a significant share occurred over the five-year period between 1968 and 1972.

The passage of the 1964 Civil Rights Act[3] prohibited school districts that were operating a racially dual school system from receiving federal aid, and allowed the Justice Department to join suits against school districts that were in violation of the *Brown* order to integrate. This resulted in a significant drop in the extent of racial school segregation thereafter reinforced by the actions of federal courts. A substantial portion of school districts adopted desegregation plans only after court order (or the threat of court action) due to individual cases filed.

Johnson (2015), using data linked with a comprehensive case inventory of the timing of all desegregation litigation cases, shows school district per-pupil

1 *Brown v. Board of Education of Topeka* 347 U.S. 483 (1954).

2 Ibid. *Brown v. Board of Education of Topeka* 349 U.S. 294 (1955).

3 Civil Rights Act of 1964, Pub.L. 88–352, 78 Stat. 241 (1964).

spending increased by nearly $1,000 by the end of the fourth year after court-ordered desegregation relative to the year immediately preceding the initial court order, which differed markedly from the trend leading up to the year these rulings went into effect. The large increase in school district per-pupil spending was driven solely by the infusion of state funds following the timing of court-ordered school desegregation in districts with a sizable number of black students. Johnson (2015) provides suggestive evidence that states infused greater funds into districts undergoing desegregation to ensure that black students would receive the same level whites were previously receiving (i.e., without affecting prevailing resource levels for white students).

Furthermore, Johnson (2015) finds that, for blacks, school desegregation significantly increased educational and occupational attainments, college quality, and adult earnings; reduced the probability of incarceration; and improved adult health status. Desegregation had no effects on whites across each of these outcomes. The results suggest that the mechanisms through which school desegregation led to beneficial adult attainment outcomes for blacks include improvement in access to school resources reflected in reductions in class size and increases in per-pupil spending. The idiosyncratic nature of the timing of court-ordered desegregation helps to identify its effects on intergenerational mobility separately by race (outlined and presented on pages 310–321).

School Finance Reforms

Historically, the rules that determine school funding have not necessarily helped realize the long-standing ideal of equal educational opportunities for all children. School funding disparities in K–12 education, caused in part by disparities in local taxable property wealth and concerns that school spending inequalities undermine the provision of equal educational opportunities fueled a movement toward school finance reform litigation and legislation over the past several decades. For example, in 1970, on the eve of the first successful state litigation case with regard to school finance, school spending varied dramatically, by multiples, even within the same state.[4] While average public school spending levels have increased significantly since 1970, aggregate spending levels mask substantial differences in the distribution of spending.

Courts played an important role in school-related cases during the past three decades, particularly school finance reform. The judicial landmarks of the school desegregation cases provided part of the basis upon which the

4 Note that many low-income urban districts raise local funding from commercial property, so although low-income students typically receive lower levels of funding *on average*, this is not always the case (Hoxby 2001).

movement toward school finance reform litigation and debates about the constitutionality of local finance systems would be waged. School finance cases were founded on the basis that existing local systems of school finance violated the equal protection clause of the relevant state constitution and the responsibility of the state to provide access to adequate and equitable public schooling to all children. In response to large within-state differences in per-pupil spending across wealthy and poor districts, state supreme courts overturned school finance systems in 28 states between 1971 and 2010, and many states have implemented legislative reforms leading to important changes in public education funding.[5] As documented in Jackson, Johnson, and Persico (2014) (hereafter JJP), the school finance reforms (SFRs) that began in the early 1970s and accelerated in the 1980s caused some of the most dramatic changes in the structure of K–12 education spending in U.S. history.

JJP, using a comprehensive inventory of the timing of school finance litigation across states and the type of state aid formula changes that occurred between 1970 and 2010, found that court-ordered school finance reforms have been instrumental toward the goal of equalizing per-pupil spending and have worked primarily by raising spending at the bottom of the distribution while leaving spending at the top unchanged. Well-designed SFRs successfully weakened the link between district per-pupil spending and local property wealth, while at the same time increasing the level of spending in lower-income districts thereby reduced spending disparities caused by differences in local taxable property wealth. Furthermore, JJP found that, for low-income children, a 10 percent increase in per-pupil spending throughout school-age years leads to about 0.5 additional year of completed education, 10 percent higher earnings, and a 6 percentage-point reduction in the annual incidence of adult poverty.

Head Start

Head Start is the largest targeted early childhood intervention program in the United States and was established in 1964 as part of President Lyndon B. Johnson's War on Poverty to provide education, health, and other services to poor children. Head Start is a comprehensive, national, federally funded program with the potential to improve the human capital, health capital, and school readiness of poor children and thereby reduce the intergenerational persistence of poor economic status. While Head Start has been shown to have positive long-term impacts on schooling and other outcomes (Garces et al. 2002; Ludwig and Miller 2007; Deming 2009), lack of data linking early childhood education, K–12 school experiences, and adult outcomes has limited

5 The first of these cases was the well-known California case, *Serrano v. Priest*, decided in 1971. *Serrano v. Priest*, 5 Cal.3d 584.

some prior evaluation efforts; this analysis aims to fill some of the gap with regard to economic mobility.

Failure to adequately address the endogeneity of Head Start participation and resultant selection bias issues can lead to an understatement of the potential benefit of the program, since the program targets economically disadvantaged children. Following Johnson and Jackson (2015), the research design takes advantage of the geographic expansion of Head Start programs and spending increases during the first 15 years of the program (1965–80) to overcome these selection issues. The changing availability and quality of Head Start was largely beyond the control of parents during the early years of the program's inception and roll-out and would not be expected to affect children independently of the programs themselves. As a result, residentially immobile poor families were often able to enroll younger but not older children.

Early-life interventions, such as Head Start, may not realize their potential long-term returns without subsequent investments in quality schools during the school-age years. Prior research shows that initial gains in academic achievement tests from participation in Head Start "faded out" in elementary school; perhaps this decline occurred because the former Head Start participants generally attended lower quality schools (Currie and Thomas 2000). The quality of early care may influence the ability to make use of later school opportunities and educational supports during school-age years. Accordingly, the potential interactive influences of human capital investments from pre-school through high school are investigated in this paper. In particular, children's differential exposure to Head Start spending (at age four) and SFRs during their school-age years, depending on place and year of birth, are used to analyze the interactive effects of both Head Start spending increases and school finance reform-induced spending increases on children's subsequent rates of intergenerational mobility. The roll-out of Head Start, desegregation, and school finance reform-induced increases in school spending during these birth cohorts' childhood provide a unique opportunity to evaluate the long-term impacts of ground-breaking legislation designed to improve educational investment opportunities for poor and minority children.

Intergenerational Mobility Measures

The overwhelming majority of research on intergenerational mobility focuses only on parental income (where parental income serves as a proxy for parental investments). However, investments through government spending on children may have equally significant effects in influencing future income

potential. Indeed, direct government investments in human capital are substantial in the United States.[6]

One of the predictions of the standard Becker-Tomes (1979; 1986) human capital model of intergenerational income transmission posits that greater public provision of schooling increases intergenerational income mobility (see also Solon 2004). A large increase in public investment in education is expected to increase economic mobility across generations, because it affects children from low-income families more than children from affluent families. Increases in the return to education that have occurred over the past three decades will strengthen the link between parent and child incomes (Solon 2004), other things equal, and may change the social and economic costs of unequal opportunity.

The most commonly used measure of intergenerational mobility, the intergenerational elasticity (IGE), is not well suited for comparing black-white differences in mobility with respect to the *entire* income distribution (comprising both blacks and whites). Moreover, it does not provide a detailed picture of which individuals are moving up or down in the income distribution. The IGE, which is focused on averages, offers a limited view of mobility in that it is not informative about the persistence of economic status across generations at different points of the parental income distribution (e.g., for bottom quintile, middle, versus upper quintile). The same intergenerational elasticity can characterize both a society with high levels of mobility in the middle of the parental distribution and less mobility in the tails, as well as a society with moderate levels of mobility throughout the distribution. In addition, the IGE cannot distinguish between a societal opportunity structure in which the variance in children's adult incomes, conditional on parental income, is large and one in which the variance is small as long as the expected values of the child's adult income are the same. In these ways, IGE can miss important features in characterizing differences in mobility opportunities. Therefore, the present analysis goes beyond these aggregated measures of mobility.

Building on the recent methodological contributions of Bhattacharya and Mazumder (2011), measures of upward mobility that compare the relative positions of parents and children are used in the income distribution of each

6 Currently, education expenditures alone exceed $450 billion annually, or more than $5,800 per person between the ages of 5 and 24. In addition, federal outlays for health exceed $350 billion per year. Public school spending and other government expenditures targeted toward disadvantaged families may, in principle, substantially narrow the investment gap between children of rich and poor families, and thereby reduce the resultant education and earnings gap. This will depend in part on the progressivity of the education policy and other public investments in children's human capital (i.e., the degree to which children from disadvantaged backgrounds disproportionately benefit from public programs).

respective generation. For example, upward mobility can be measured by an indicator for whether the child's rank in the distribution is higher than the parents' rank in the prior generation (and the extent of generational change in rank). These measures are well suited for comparing group differences in intergenerational mobility rates. A key advantage of these measures is that, unlike the transition probability that imposes an arbitrary threshold for measuring mobility, these upward mobility measures use the parents' rank as a yardstick for mobility.

Following Bhattacharya and Mazumder (2011), this paper uses a measure of upward rank mobility (UP), which estimates the likelihood that an individual will surpass their parent's position in the income distribution by a given amount, conditional on their parents being at or below a given percentile.

$$UP_{t,s} = \Pr(Y_1 - Y_0 > \tau \mid Y_0 \leq s) \quad (1)$$

In the simple case where $\tau = 0$, this is simply the probability that the child exceeds the parents place in the distribution. Positive values of τ enable measurement of the *amount* of the gain in percentiles across generations. Results are presented for τ =0, 0.1, 0.2, 0.3 and also as s is progressively increased and estimates are presented based on parental rank intervals.

The regression models also use as a mobility measure the generational change in rank position in the (respective generation's) income distribution as a dependent variable, which is simply the child's rank minus parent's rank. Importantly, the mobility measures use distributions that pool across races so that mobility is compared using a common distribution. The regression models also control for the parent's rank and, in some models, condition the sample on being born in the bottom half of the parental income distribution.

$$UP_{\tau,s} = \Pr(Y_1 - Y_0 > \tau \mid s_1 \leq Y_0 \leq s_2) \quad (2)$$

Measures of permanent family income for each generation are utilized to create the mobility measures. The measure of permanent family income of parents uses multi- year averages of income when children were between the ages of 12 and 17.[7] The measure of permanent family income of children in adulthood is constructed using data on the adult family income of the children during all survey years when sample members were between the ages of 28 and 40 and were not in school and were not pregnant. Observation of adults in their

7 For a small subset of children for which this information is not available (e.g., children born 1945–49), information collected in the 1988 survey reports of parental income and retrospective reports of parental economic status collected in other waves is used (when this information was unavailable it was imputed based on mother's and father's occupation and education). Results are very similar when the sample is restricted to only those in which parental income is available when children are ages 12–17.

30s are used to compare measures of permanent family income of children from different birth cohorts at the same age. Years of zero income are included in the multi-year averages between ages 28 and 40 if the individual was not in school and not pregnant. Family income is converted into real 2000 dollars using Consumer Price Index for All Urban Consumers (CPI-U) inflation adjustments. Haider and Solon (2006) demonstrate that lifecycle bias can affect estimates of the intergenerational elasticity in permanent income, but that such bias is minimized in the United States when income is measured between the ages of 35 and 40. Upward rank mobility measures utilized here appear less sensitive to life cycle bias than IGE measures of mobility, and the construction of permanent family income of children in adulthood on average is evaluated at age 35, when any such potential bias is minimized. This paper focuses on measures of *relative* mobility across generations and the measures are relevant for answering questions concerning the relative progress of blacks compared to whites.

Data

This paper compiles data on school spending, which is linked to databases on Head Start budgets and data describing the timing of school desegregation and various school finance reforms. These data are linked to a nationally representative longitudinal dataset that tracks individuals from childhood into adulthood. Education funding data from several sources is combined to form a panel of per-pupil spending for U.S. school districts in 1967 and annually from 1970 through 2010.[8] County-level Head Start spending during the first 15 years of the program (1965–80), when these individuals were three to five years old, were acquired from the National Archives and Records Administration (NARA). To avoid confounding nominal changes with real changes in spending over time, school spending is converted across all years to 2000 dollars using the CPI. School district boundaries that prevailed in 1969 are used to link school districts to counties and pull county-level median family income data from the 1970 Census. The spending data are then linked to databases of initial timing of court-ordered desegregation and SFRs between 1954 and 2010.[9]

8 The Census of Governments has been conducted every five years since 1972 and records school spending for every school district in the United States. The Historical Database on Individual Government Finances, contains school district finance data annually for a sub-sample of districts from 1967, and 1970 through 1991. After 1991, the Common Core of Data School District Finance Survey (F-33) includes data on school spending for every school district in the United States. Additional details on the data and the coverage of districts in these data are contained in Jackson, Johnson, and Persico (2015).

9 Additional details on the data and the coverage of districts in these data are contained in Jackson, Johnson, and Persico (2015).

The intergenerational data of adult economic outcomes come from the PSID (1968–2013) that links individuals to their census blocks during childhood.[10] The sample consists of PSID sample members born between 1945 and 1979 who have been followed into their 30s through 2013. This corresponds to cohorts that both straddle the first major waves of desegregation implementation and first set of court-mandated SFRs (the first court order was in 1971) and who are also old enough to have completed formal schooling and be observed with valid family income measures in their 30s by 2013. Sixty-six percent of those cohorts in the PSID grew up in a school district that was subject to a desegregation court order sometime between 1954 and 1990, and two-thirds of those cohorts in the PSID grew up in a school district that was subject to a court-mandated school finance reform between 1971 and 2000. Both the Survey Research Center component and the Survey of Economic Opportunity component, commonly known as the "poverty sample," of the PSID sample are included. The PSID oversampled low-income and black families, which enables sufficient sample sizes of Head Start eligible children among these birth cohorts. All of the analyses utilize the PSID sampling weights to produce nationally representative estimates.

To avoid complications arising from endogenously changing district boundaries over time, the earliest available childhood residential address is matched to the school district boundaries that prevailed in 1969. The algorithm is outlined in Jackson, Johnson, and Persico (2015).[11] Each record is merged with data on school spending, county-level Head Start spending per four year old, and the aforementioned school desegregation and school finance variables at the school district level that correspond with the prevailing levels during their school-age years. Finally, In-county characteristics from the 1962 Census of Governments and 1970 Census are merged with information on other key policy changes (described on pages 310–13) during childhood,

10 The PSID began interviewing a national probability sample of families in 1968. These families were re-interviewed each year through 1997, when interviewing became biennial. All persons in PSID families in 1968 have the PSID "gene," which means that they are followed in subsequent waves. When children with the "gene" become adults and leave their parents' homes, they become their own PSID "family unit" and are interviewed in each wave. The original geographic cluster design of the PSID enables comparisons in adulthood of childhood neighbors who have been followed over the life course. Studies have concluded that the PSID sample remains representative of the national sample of adults (Fitzgerald, Gottschalk, and Moffit 1998).

11 Many school districts were counties during this period, including more than one-half of Southern school districts. Prior work (Johnson 2014; Jackson, Johnson, and Persico 2015) shows that the results are not biased by endogenous residential mobility and are robust to using only those who lived in their childhood residence prior to initial court orders.

allowing for an unusually rich set of controls.[12]

The final sample includes 13,540 individuals (5,063 black children; 8,127 white children; 7,285 low-income children;[13] 6,255 non-poor children) from 4,735 childhood families, 1,570 school districts, 1,229 counties, and all 50 states and the District of Columbia.

Unconditional Estimates of Intergenerational Mobility

Upward mobility estimates are presented for all children and separately by race among cohorts born between 1945 and 1979. Table 1, figures 1A-1B, and figure 2 present estimates of upward rank mobility based on equation (1). In addition, the black-white difference is plotted along with 95 percent confidence bands.[14] The results reveal significant black-white differences in rates of upward mobility at virtually every parental percentile rank interval. For example, 48.5 percent of blacks whose parents were between the 21st and 25th percentile surpass their parents' percentile in the family income distribution, whereas that percent is 69.6 among whites (a statistically significant 21 percentile-point race difference) (figure 1A). Blacks exhibit especially lower rates of substantial mobility (i.e., surpass their parents' percentile in the family income distribution by more than 20 percentile points) than corresponding rates of whites at the same parental percentile rank interval (figure 1B). As shown in table 1 and figure 1B, 32.6 percent of blacks whose parents were between the 21st and 25th percentile surpass their parents' percentile in the family income distribution by more than 20 percentile points, whereas that percent is 47 among whites (a statistically significant 14.4 percentile-point race difference).

12 The data include measures from 1968–88 Office of Civil Rights data; 1960, 1970, 1980, and 1990 Census data; 1962–99 Census of Governments data; Common Core Data compiled by the National Center for Education Statistics; Regional Economic Information System data; a comprehensive case inventory of court litigation regarding school desegregation over the 1955–90 period (American Communities Project); and the American Hospital Association's Annual Survey of Hospitals (1946–90) and the Centers for Medicare and Medicaid Services data files (dating back to the 1960s) to identify the precise date in which a Medicare-certified hospital was established in each county of the United States (an accurate marker for hospital desegregation compliance).

13 Following Ben-Shalom, Moffitt, and Scholz (2011) and Short and Smeeding (2012), a child is defined as "low income" if parental family income falls below two times the poverty line for any year during childhood. This captures both the poor and the near poor.

14 These are produced by using the bootstrap method. Bhattacharya and Mazumder (2011) show that the bootstrap method is a valid method of inference for these measures.

Table 1. Upward mobility estimates by race using intervals of parental income

$$UP_{\tau,s} = \Pr(Y_1 - Y_0 > \tau \mid s_1 \leq Y_0 \leq s_2)$$

PARENT INCOME RANK (S)	$\tau = 0$				$\tau = 0.1$			
	ALL	WHITES	BLACKS	W-B	ALL	WHITES	BLACKS	W-B
1 to 5	0.960094	0.956975	0.963021	-0.006047	0.685064	0.742234	0.618715	0.123519
	0.007517	0.012506	0.007282	0.014246	0.017251	0.027263	0.021505	0.035593
6 to 10	0.857048	0.900065	0.769841	0.130224	0.665150	0.747107	0.484472	0.262635
	0.014546	0.017365	0.026784	0.032246	0.020330	0.026240	0.028770	0.039440
11 to 15	0.770869	0.796608	0.698573	0.098035	0.652069	0.685164	0.555835	0.129328
	0.019871	0.025215	0.033356	0.042917	0.023499	0.029125	0.038698	0.047878
16 to 20	0.729591	0.763878	0.587921	0.175957	0.603372	0.638755	0.439337	0.199418
	0.022349	0.024973	0.037505	0.044455	0.023228	0.027221	0.042826	0.050976
21 to 25	0.670662	0.695512	0.485347	0.210165	0.545073	0.569630	0.409578	0.160051
	0.022504	0.025263	0.049516	0.054579	0.021346	0.025216	0.047517	0.054132
26 to 30	0.610259	0.638741	0.485314	0.153428	0.491663	0.519455	0.371162	0.148293
	0.020758	0.023372	0.045614	0.052879	0.023277	0.026788	0.049263	0.057967
31 to 35	0.595934	0.622267	0.450275	0.171992	0.492705	0.513551	0.360157	0.153395
	0.023318	0.025202	0.064036	0.066555	0.023485	0.025325	0.055819	0.062389
36 to 40	0.575779	0.592950	0.296073	0.296878	0.447899	0.462280	0.212991	0.249289
	0.024286	0.025889	0.072146	0.080124	0.026498	0.028252	0.059039	0.066851
41 to 45	0.530750	0.539638	0.382038	0.157601	0.428393	0.434632	0.320205	0.114427
	0.023057	0.023883	0.067294	0.071458	0.022127	0.023169	0.077964	0.081786
46 to 50	0.537554	0.547191	0.403047	0.144144	0.434219	0.443258	0.285319	0.157940
	0.025098	0.026956	0.076582	0.081956	0.023672	0.025749	0.068855	0.074381

TABLE 1 CONTINUED ON NEXT PAGE

TABLE 1 CONTINUED

PARENT INCOME RANK (S)	$\tau = 0.2$				$\tau = 0.3$			
	ALL	WHITES	BLACKS	W-B	ALL	WHITES	BLACKS	W-B
1 to 5	0.502154	0.564924	0.439008	0.125916	0.375359	0.448003	0.299662	0.148341
	0.019494	0.030367	0.022726	0.038369	0.020835	0.033274	0.026194	0.044088
6 to 10	0.502917	0.552696	0.389579	0.163117	0.386359	0.425868	0.304348	0.121520
	0.022468	0.029494	0.031087	0.042915	0.017783	0.025396	0.026200	0.038673
11 to 15	0.528285	0.570976	0.399664	0.171311	0.403770	0.455714	0.285894	0.169820
	0.023332	0.027960	0.038819	0.046764	0.022723	0.027551	0.034587	0.043455
16 to 20	0.515719	0.556944	0.336184	0.220760	0.399662	0.437934	0.249599	0.188335
	0.026313	0.031819	0.039496	0.049123	0.022792	0.027383	0.032182	0.039438
21 to 25	0.448168	0.469921	0.325947	0.143974	0.335782	0.352125	0.238027	0.114098
	0.025792	0.030793	0.040930	0.051120	0.022035	0.025169	0.045511	0.052044
26 to 30	0.396582	0.423600	0.279706	0.143894	0.298690	0.325184	0.166222	0.158963
	0.022702	0.026156	0.045677	0.054465	0.020433	0.024699	0.031878	0.041841
31 to 35	0.388555	0.404243	0.314096	0.090147	0.294985	0.309146	0.203268	0.105879
	0.024244	0.026324	0.059752	0.063905	0.020413	0.023285	0.049668	0.055762
36 to 40	0.318380	0.327804	0.160121	0.167683	0.219474	0.221544	0.137462	0.084081
	0.024711	0.026662	0.051676	0.058213	0.020758	0.021671	0.054310	0.054578
41 to 45	0.302060	0.304104	0.262789	0.041316	0.212612	0.213481	0.185498	0.027983
	0.024704	0.025322	0.068290	0.071817	0.021835	0.023104	0.056872	0.063442
46 to 50	0.327918	0.329326	0.250693	0.078633	0.213841	0.213483	0.134349	0.079134
	0.022135	0.024048	0.064474	0.071469	0.019208	0.019469	0.055563	0.056042

Note: Analysis sample includes all PSID individuals born 1945–79, followed into at least their 30s through 2013, and their parents' income. 13,540 individuals (5,063 black children; 8,127 white children; 7,285 low-income children ; 6,255 non-poor children) from 4,735 childhood families, 1,570 school districts, 1,229 counties, and all 50 states. Bootstrapped standard errors presented below mobility estimates.
Source: Intergenerational income data: PSID (1968–2013).

Figures 1A-B. Upward mobility estimates by race using intervals of parental income

FIGURE 1A. $\tau = 0$

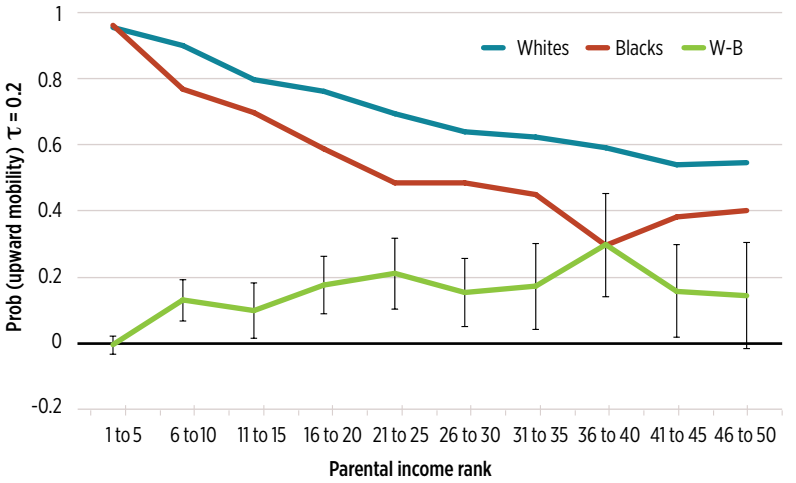


FIGURE 1B. $\tau = 0.2$

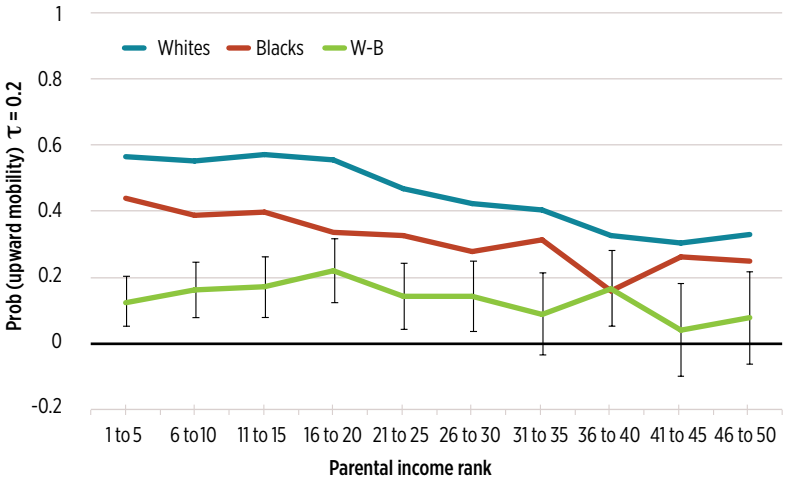
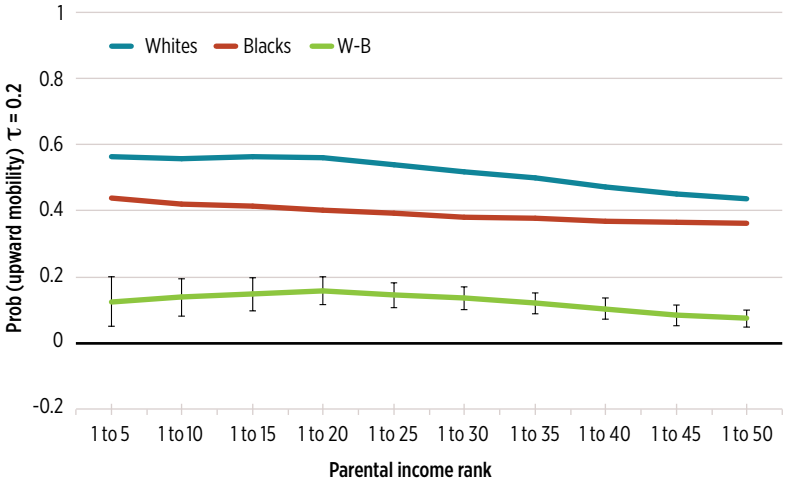


Figure 2. Upward mobility estimates by race: $\tau = 0.2$



Figures 1A-1B and figure 2 present similar patterns of race differences in upward mobility rates throughout the range of parental percentile rank intervals among children born in the bottom half of the income distribution.

In order to estimate how rates of upward mobility differ by birth cohort for both blacks and whites using a non-parametric approach, samples of children born in the bottom half of the income distribution are used to estimate locally weighted regressions, by race, where the outcome is an indicator for children exceeding their parents' rank as an adult. The models control for parental percentile rank in the income distribution. A series of plots of the upward mobility probability are produced for each of the various birth cohorts spanning 1945–79 for blacks and whites (conditional on parental percentile rank). Since there are a large number of potential estimates of upward mobility, the analysis is simplified by focusing only on the probability that children surpass their parents' position in the income distribution and the probability that they surpass their parent's position by at least 20 percentile points (i.e., substantial mobility), both conditional on their parents' rank. The birth cohort patterns of the conditional mobility outcomes are calculated using a Jianqing Fan (1992) locally weighted regression smoother, which allows the data to determine the shape of the function, rather than imposing a functional form. The racial differences presented are all statistically significant.

As shown in figures 3A-3C, whites exhibit roughly similar rates of upward mobility across the various cohorts born between 1950 and 1979; for example,

Figures 3A-C. Intergenerational mobility estimates among children born into bottom half of income distribution, by race and year of birth

FIGURE 3A. τ = 0

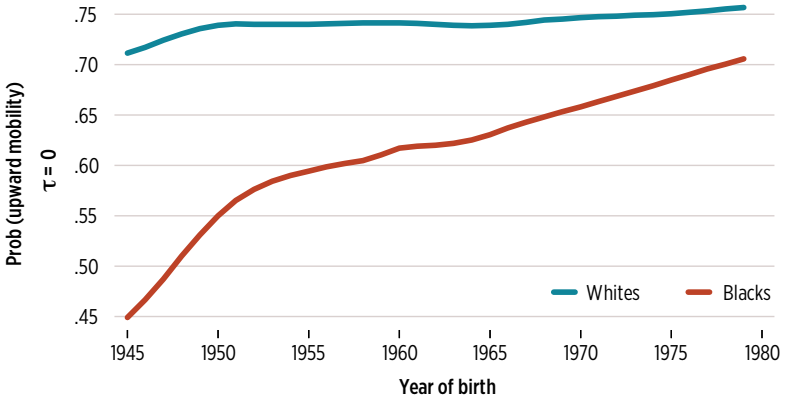
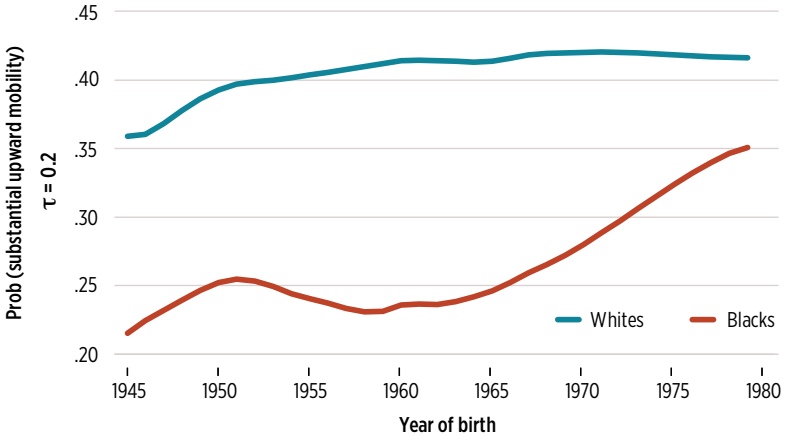
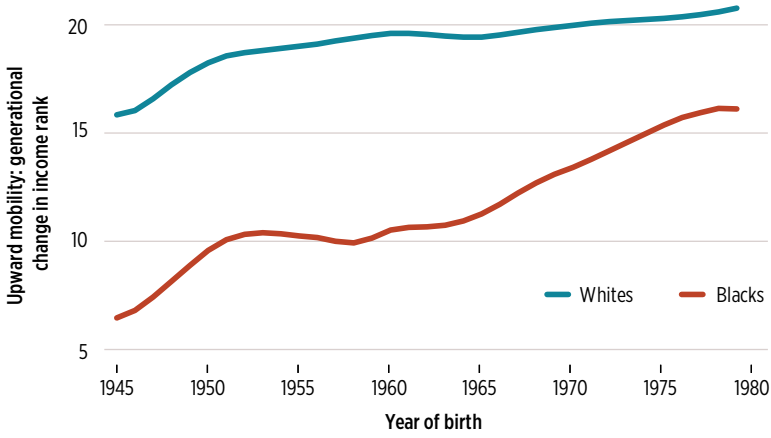


FIGURE 3B. τ = 0.2



about 75 percent of white children whose parents were at the 20th percentile surpassed their parents' percentile in the family income distribution (figure 3A), and roughly 41 percent of whites experienced substantial mobility (figure 3B). These rates did not significantly change for successive cohorts of whites born between 1950 and 1979. In stark contrast, rates of upward mobility for

FIGURE 3C.



blacks rose sharply for successive cohorts born between 1945 and 1979. The rapid convergence of blacks' rates of upward mobility with that of whites is highlighted in the fact that for cohorts born in the late 1940s and early 1950s (cohorts that were not exposed to desegregation implementation and SFRs during their school-age years), the black-white difference in the likelihood of upward mobility among children whose parents were at the 20th percentile was nearly 20 percentile points (about 0.55 vs. 0.74); for cohorts born in the late 1970s this mobility gap narrowed to only a 5 percentile-point difference (about 0.70 vs. 0.75) (figure 3A). As shown in figure 3B, a similar pattern of rapid racial convergence emerges for successive cohorts born between 1960 and 1979 when the probability of substantial mobility is examined (albeit not as stark), which is driven by significant improvements for blacks over this period. Figure 3C presents the results for the generational change in income rank, where we see that for cohorts born in the late 1950s and early '60s the black-white difference in the average generational change in rank among children whose parents were at the 20th percentile was nearly 10 percentile points (about 10 vs. 19); for cohorts born in the late 1970s this racial mobility gap had shrunk by more than half (about 16 vs. 20).[15]

15 In a related study, Chetty et al. (2014) find measures of intergenerational mobility have remained stable for more recent cohorts born between 1971 and 1993. The present paper finds a sharp increase in generational income mobility among African Americans among successive birth cohorts born between 1955 and 1979 and shows its relatedness to dimensions of access to school quality. The two sets of findings do not necessarily conflict, as the study time periods barely overlap and Chetty et al. cover the whole population for more recent cohorts while the present study focuses on mobility rates for blacks and whites among older birth cohorts that overlap these policy changes.

Using the National Longitudinal Survey of Youth, Bhattacharya and Mazumder (2011) find that cognitive skills during adolescence appear to explain much of the difference in the racial gap in men's upward mobility. This paper focuses on reform-induced changes in dimensions of school quality during pre-K–12 that may influence both cognitive and non-cognitive skill development and thereby affect upward mobility prospects.

Empirical Strategy

The main difficulty in disentangling the relative importance of childhood family, neighborhood, and school quality factors is isolating variation in school quality characteristics that are unrelated to family and neighborhood factors. The primary interest is shedding light on the causal school-related factors that may explain the observed patterns of intergenerational mobility and the impacts of equal educational opportunity policies designed to address racial differences in mobility. For example, this paper investigates whether school desegregation improved the prospects for upward mobility of black children and whether it reduced the racial gap in upward mobility rates. Similarly, it examines the extent to which both school finance reform-induced spending increases and Head Start spending led to increases in upward mobility for poor children.

It is hypothesized that school desegregation may have long-run impacts on the upward mobility of African Americans through several potential mechanisms:

1. school quality resource effects (e.g., the distribution and level of per-pupil spending, class size, teacher quality)
2. peer exposure effects (e.g., children in classrooms with highly motivated and high-achieving students are likely to perform better due to positive spillover effects on other students in the classroom)
3. effects on parental, teacher, and community-level expectations of child achievement

The long-run effects of each hypothesized mechanism operate via their influence on the quality and quantity of educational attainment, examining the hypothesized primary mechanism: changes in school quality resulting from abrupt shifts in racial school segregation.

Following Johnson (2015), an event-study difference-in-difference framework is used to exploit the wide quasi-random variation in the timing and scope of court-ordered desegregation during the 1960s, '70s and '80s to identify the impacts of school desegregation on intergenerational mobility,

separately by race. Treatment dosage in this context is the product of the number of school-age years of exposure and the treatment intensity (i.e., the amount of reform-induced changes in school segregation and school spending). This paper tests for a dose-response effect with years of exposure (see Johnson 2015 for full details and discussion of the estimation methods). Specifically, this paper estimates equations of the form:

$$Y_{idb} = \sum_{T=-20}^{-1} \alpha_T^r \bullet I_{T_{idb}=T} + \sum_{T=1}^{12} \theta_T^r \bullet I_{T_{idb}=T} + \sum_{T=13}^{20} \delta_T^r \bullet I_{T_{idb}=T} \quad (3)$$
$$+ X_{idb}\beta + Z_{db}\gamma + (W_{1960d} * b)\phi^r + \eta_d^r + \lambda_b^r + \varphi_g^r * b + \varepsilon_{idb}$$

where i indexes the individual, d the school district, b the year of birth, g the region of birth (defined by 9 census division categories), and r the racial group. The variable T_{idb} is the year individual i from school district d turned age 17 minus the year of the initial desegregation court order in school district d. Accordingly, the timing indicators, $I_{T_{idb}=T}$, are equal to 1 if the year individual i from school district d turned age 17 minus the year of the initial desegregation court order in school district d equals T and zero otherwise. I include indicators for values of T between -20 and 20, which is the full support of years individuals were age 17 relative to initial court order years in the sample. Values of T between -20 and -1 represent unexposed cohorts who turned between the ages of 18 and 37 in the year of the initial court order; a value of 0 is our reference category and represents individuals who turned 17 in the year of the initial court order and were thus not exposed; values between 1 and 11 represent exposed cohorts who were "partially treated" because they were of school-going age (6 through 16) at the time of the initial court order but had less than 12 years of expected exposure; and values of 12 and greater represent fully treated exposed cohorts who turned 5 or younger during the year court-ordered desegregation was enacted and were therefore expected to attend desegregated schools for all 12 years of public schooling.

The model includes race-specific school district fixed effects (η_d^r), race-specific birth year fixed effects (λ_b^r), race-by-region of birth cohort trends ($\varphi_g^r * b$), controls for an extensive set of child and childhood family characteristics (X_{idb}: parental education and occupational status, mother's marital status at birth, birth weight, child health insurance coverage, gender). To control for trends in factors hypothesized to influence the timing of court orders, interactions are included between 1960 characteristics of the county of birth and linear trends in the year of birth ($W_{1960d} * b$): 1960 county poverty rate, percent black, average education level, percent urban, population size, percent of the county that voted for Strom Thurmond in the 1948 Presidential election (as a proxy for white segregationist preferences). Finally, to account for the effect of

other policies, county-by-birth year level measures are included of per capita expenditures on Head Start (at age four), hospital desegregation, community health centers, state funding for kindergarten, imposition of tax limit policies, in addition to Title I school funding (average during ages 5–17), and average childhood spending on food stamps, Aid to Families with Dependent Children, Medicaid, and unemployment insurance, (Z_{db}). Few studies simultaneously account for so comprehensive a set of policies.

The analyses of the effects of school finance reform-induced increases in per-pupil spending employ a similar set-up following Jackson, Johnson, and Persico (2015) and use both the timing of passage of court-mandated reforms and the type of funding formula introduced by that reform as exogenous shifters of school spending. Specifically, for each district the spending change that the district would experience after the passage of court-mandated school finance reform is predicted based on the experiences of similar districts facing similar reforms in different states. It is then determined if "treated" cohorts (those young enough to have been in school during or after the reforms were passed) have better mobility outcomes relative to "untreated" cohorts (children who were too old to be affected by reforms at the time of passage) in districts predicted (based on the experiences of similar districts in other states) to experience larger reform-induced spending increases (see Jackson, Johnson, and Persico 2015 for full details and discussion of the estimation methods).

Finally, the identification strategy used to isolate effects of county-level Head Start spending compares mobility outcomes among those who grew up in communities where Head Start was not available by the age of four with individuals from those same areas (the same childhood county of upbringing) after Head Start became available (controlling for year of birth and age effects, and the inclusion of school district fixed effects). The changing availability and quality of Head Start was largely beyond the control of parents during these early years of the program's inception and roll-out (1965–80), and would not be expected to affect children independently of the programs themselves. As a result, residentially immobile poor families were often able to enroll younger but not their older children.

A key innovation here is modeling early and later educational investments jointly, as the impact of policies at each childhood-specific investment stage may have long-run consequences for investment at other stages. Accordingly, this paper explores potential synergies between the effects of increases in Head Start spending and effects of reform-induced increases in K–12 school spending due to SFRs (or desegregation) on children's subsequent economic mobility outcomes. In particular, interactions are included between Head Start spending increases and instrumented school spending increases during K–12 (resultant from SFRs, where the timing of court-mandated reforms

and the type of funding formula introduced are used as instrumental variables for average K–12 per-pupil spending). All models include the same main set of controls:

- school district fixed effects
- race-specific region and year of birth effects
- controls for linear cohort trends in 1960 county characteristics
- controls at the county-level for the timing of hospital desegregation interacted with race
- roll-out of "War on Poverty" and related safety-net programs
- childhood family characteristics[16]

Standard errors are all clustered at the school district level.

Regression Results

The mean probability of upward mobility for black children whose parents were between the 16th and 20th percentile rank of the income distribution was 0.588 and that likelihood was 0.336 for the probability of substantial mobility (i.e., surpass their parents' percentile in the family income distribution by more than 20 percentile points). In contrast, the mean probability of upward mobility for white children whose parents were between the 16th and 20th percentile rank of the income distribution was 0.764 and that likelihood was 0.557 for the probability of substantial mobility (table 1, figures 1A-1B). Similarly, among children born in the bottom quintile, the probability of substantial mobility for blacks is 0.402, whereas that probability is 0.561 for whites (a statistically significant 16 percentile-point race difference) (figure 2). As documented on pages 313–21, there was rapid racial convergence in upward mobility rates over this period. This section examines the role of equal education opportunity policies as a potential factor that fueled this convergence.

16 The models that analyze effects of desegregation also include an indicator for whether the school district was ever under court order at some point between 1954–90 and interaction terms of this indicator with all controls, since districts that were never under a court order may exhibit different time trends independent of desegregation implementation as these districts typically had small fractions of minority students. The identification in these models thus relies exclusively on the quasi-random timing of desegregation court orders. The desegregation models focus on cohorts born between 1945 and 1968, given the earlier timing of desegregation implementation (relative to SFRs).

Effects of Desegregation

Figures 4A and 4B present results from fully non-parametric event-study models of the effects of school desegregation exposure on intergenerational mobility, separately for blacks and whites. Three key patterns clearly emerge from the analysis.

First, there is no evidence of pre-existing trends in mobility outcomes before desegregation orders are enacted.

Second, after enactment, there is a structural break in the trend for blacks. The results indicate that, for blacks, the onset of desegregation exposure produces an immediate jump in mobility prospects. Each additional year of exposure leads to a 1.5 percentile-point increase in the generational relative rank in the income distribution with an additional jump for those exposed throughout their school-age years (figures 4A–4B). Similarly, conditional on their parents' rank, there are large, statistically significant effects on the likelihood of substantial upward mobility (i.e., the probability that they surpass their parents' position by at least 20 percentile points) for blacks. Each additional year of exposure to court-ordered desegregation leads to a significant increase in the likelihood of experiencing substantial upward mobility; in particular, a generational change in income rank of nearly 20 percentile points on average is found when comparing blacks who attended segregated schools throughout their school-age years to blacks who were exposed to desegregated schools throughout K–12 (controlling for birth cohort differences and other factors) (figures 4A-4B). The mean and standard deviation change in exposure to court-ordered desegregation for the sample is roughly five years; thus, a five-year increase in exposure translates into a generational change in income rank of 10 percentile points on average for blacks.

Third, in stark contrast, for whites there are consistently no significant effects of desegregation exposure on mobility outcomes, and the point estimates are negligible (figure 4A). The small, insignificant effects for whites provide further evidence to rule out the competing hypothesis that blacks' improvements in upward mobility were driven by secular trends in desegregated districts.

Effects of School Spending

Figure 5 presents results from fully non-parametric event study models of SFR-induced spending effects on intergenerational mobility. Table 2 presents two-stage least squares (2SLS) estimates of the effects of reform-induced spending increases on mobility outcomes of all children and children born into the bottom half of the income distribution, respectively. Once again, three key patterns clearly emerge from the analysis.

Figures 4A-B. The effects of court-ordered school desegregation on intergenerational mobility, by race

FIGURE 4A

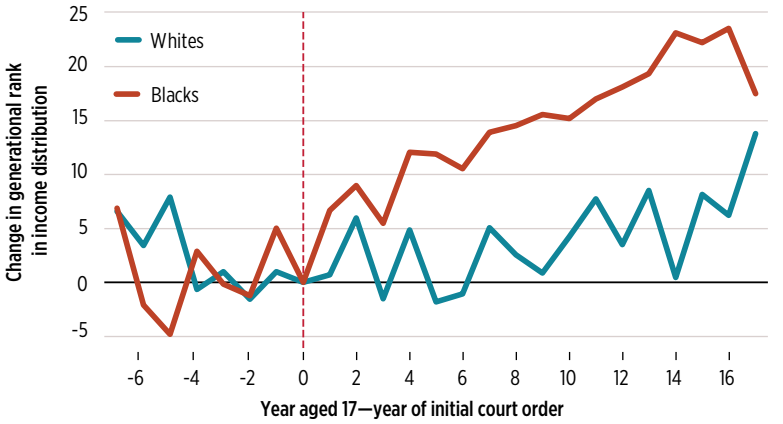
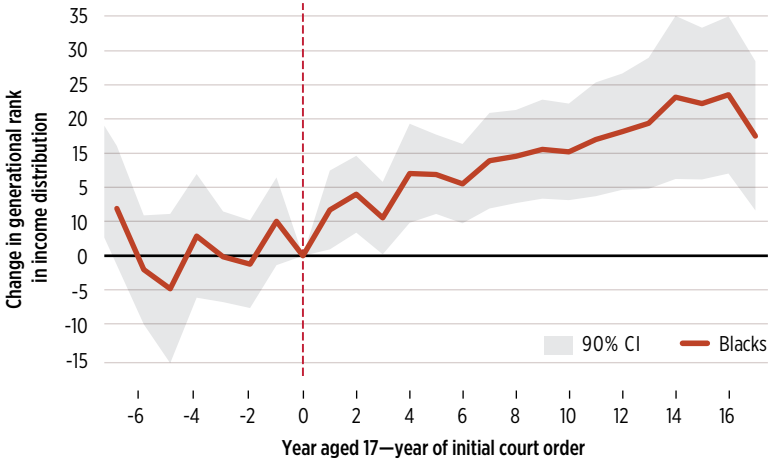


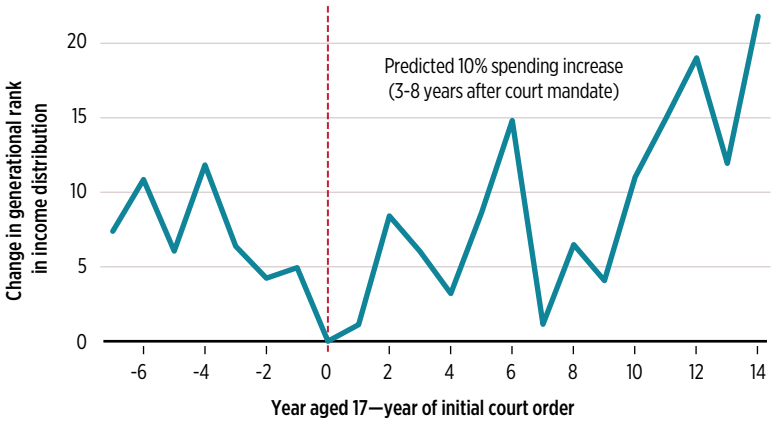
FIGURE 4B



First, there is no evidence of positive pre-existing trends in mobility outcomes before court-ordered SFRs are enacted (if anything, there is pre-existing downward trend in mobility) (figure 5).

Second, after enactment, there is a structural break in the trend for children who grew up in districts that experienced significant increases in school spending (due to SFRs); this pattern is particularly pronounced for children

Figure 5. The effect of court-ordered school finance reform on intergenerational mobility, all kids



born into the bottom half of the income distribution. While the fully nonparametric event study estimates of SFR effects on mobility face significant precision issues, the post-reform coefficients for districts predicted to experience significant increases in spending due to reforms are statistically significantly different from the pre-reform trends (p-value <0.01). The 2SLS/instrumental variables (IV) results indicate that, for low-income children, a 10 percent increase in per-pupil spending each year for all 12 years of public school leads to a generational change in income rank of 7.3 percentile points on average (p-value <.01) (table 2, column 4). Additionally, no effects on mobility outcomes are found when SFRs led to negligible changes in school spending.

Third, the results indicate that the positive impacts of school spending increases on upward mobility prospects are most pronounced for lower-income children, as no significant relationship is found between reform-induced changes in spending on the mobility outcomes of children from higher-income families (i.e., those whose parents were in the top half of the income distribution). These results mirror the findings reported in Jackson, Johnson, and Persico (2015).

Effects of Head Start Spending

As shown in table 2, the results from these models also indicate significant impacts of county-level Head Start spending on mobility outcomes (independent of exposure to desegregation or SFRs). The results indicate that a $1,000

Table 2. 2SLS/IV estimates of court-ordered school finance reform induced effects of per-pupil spending on intergenerational mobility

	DEPENDENT VARIABLE: GENERATIONAL CHANGE IN RELATIVE RANK IN INCOME DISTRIBUTION			
	ALL KIDS		KIDS BORN INTO BOTTOM HALF OF INCOME DISTRIBUTION	
	(1)	(2)	(3)	(4)
Number of years of SFR exposure$_{(age\ 5–17)}$	0.2925		0.6586*	
	(0.2567)		(0.3524)	
Number of years of SFR exposure$_{(age\ 5–17)}$ * Predicted SFR-induced district spending change (in logs)$_{(3–8yrs\ after\ court\ mandate)}$	4.0830***		5.2678***	
	(1.1250)		(1.8617)	
Instrumented Ln (school district per-pupil spending)$_{(age\ 5–17)}$		42.6781**		72.9640***
		(19.5633)		(26.0591)
County Head Start spending per 4-year old$_{(age\ 4)}$ (in 000s)	0.1730***	0.1711***	0.1840***	0.1812***
	(0.0537)	(0.0541)	(0.0547)	(0.0553)
Number of individuals	13,442	13,442	9,737	9,737
Number of childhood families	4,713	4,713	3,788	3,788
Number of school districts	1,561	1,561	1,353	1,353

Robust standard errors in parentheses (clustered at school district level)
Note: *** p<0.01, ** p<0.05, * p<0.10
Data: PSID geocode data (1968–2013), matched with childhood school and neighborhood characteristics. Analysis sample includes all PSID individuals born 1945–1979, followed into at least their 30s through 2013.
Models: Results are based on 2SLS/IV models that include: parents' relative rank in income distribution, school district fixed effects, race-specific year of birth fixed effects, race*census division-specific birth year fixed effects; controls at the county-level for the timing of school desegregation*race, hospital desegregation*race, roll-out of "War on Poverty" & related safety-net programs (community health centers, food stamps, medicaid, AFDC, UI, Title-I (average during childhood yrs.)), timing of state-funded Kindergarten intro and timing of tax limit policies; controls for 1960 county characteristics (poverty rate, percent black, education, percent urban, population size, percent voted for Strom Thurmond in 1948 Presidential election*race (proxy for segregationist preferences)) each interacted with linear cohort trends; and controls for childhood family characteristics (parental income/education/occupation, mother's marital status at birth, birth weight, gender). The first-stage model include as predictors the school-age years of exposure to school finance reform interacted with the quartile of the respective school district's predicted reform-induced change in school spending based on the timing and type of court-ordered reform interacted with 1970 (within-state) district income and spending percentile categories. There exists a significant first-stage.

increase in Head Start spending leads to a generational change in income rank of 0.18 percentile points on average (p-value <.01) (table 2, column 4), and is associated with statistically significant increases in both the probability of upward mobility and substantial upward mobility among low- income children. While the point estimates for Head Start spending per four-year-old children in the county may appear small in magnitude, these should be viewed as intent-to-treat estimates, since many children in these communities were not eligible and/or did not attend Head Start, so the treatment-on-the-treated (TOT) estimate would likely be sizable.[17]

Importantly, no significant interactive effects are found of Head Start spending increases and increases in K–12 per-pupil spending (due to SFRs) on the mobility outcomes of low-income children, where the long-run effects of increases in Head Start spending are amplified when followed up by attending schools that experienced significant increases in per-pupil spending (table 3). And vice versa, the effects of school spending increases on mobility for low-income children were elevated if they were preceded by growing up in a community with higher Head Start spending per four-year-old child during their pre-school years, presumably because of boosts to school-readiness and other child developmental trajectories. Thus, for low-income children, the combined effects on mobility prospects of growing up in districts with greater Head Start spending and higher K–12 school spending are significantly greater than the sum of their parts (i.e., the independent effects of increases in Head Start and school spending in isolation).

Similarly, interactive effects of Head Start spending and desegregation exposure for poor black children can be seen, where the long-run effects of increases in Head Start spending are amplified when followed up by attending desegregated schools (table 4). And vice versa, the effects of desegregation exposure for black children were enhanced if they were preceded by growing up in a community with higher Head Start spending per four-year-old child during their pre-school years. Another way of interpreting this evidence is that it suggests the effects of Head Start are more likely to fade out when they are not followed by access to quality schools during the K–12 years.

The results highlight the importance of modeling early and later educational investments jointly, as the impact of policies at each investment stage has long-run consequences for investment at other stages. The findings provide suggestive evidence that when health care and education providers have more interaction, as in the case of children who participate in early intervention

17 Insufficient information is available from the NARA data on how many Head Start participants there were at the county level for these early years (1965–80) to compute an implied TOT effect from these estimates.

Table 3. 2SLS/IV estimates of interactive effects of Head Start spending and school finance reform-induced effects of per-pupil spending on the intergenerational mobility of low-income children

	DEPENDENT VARIABLE: GENERATIONAL CHANGE IN RELATIVE RANK IN INCOME DISTRIBUTION
	KIDS BORN INTO BOTTOM QUARTILE OF INCOME DISTRIBUTION
	(1)
County Head Start spending per 4-year old$_{(age\ 4)}$ (in 000s)	1.0701**
	(0.4739)
(SFR) instrumented Ln (school district per-pupil spending)$_{(age\ 5–17)}$	54.7257**
	(22.0752)
Head Start spending per 4-year old$_{(age\ 4)}$ * instrumented school spending$_{(age\ 5–17)}$	8.9386**
	(4.6398)
Number of individuals	5,307
Number of childhood families	2,231
Number of school districts	840

Robust standard errors in parentheses (clustered at school district level)
Note: *** p<0.01, ** p<0.05, * p<0.10
Data: PSID geocode data (1968–2013), matched with childhood school and neighborhood characteristics. Analysis sample includes all PSID individuals born 1945–79, followed into at least their 30s through 2013.
Models: Head Start spending per 4-year old in the county is centered around $5,000 (and measured in 000s) and instrumented ln (school district per-pupil spending during ages 5–17) is centered around 0.1, to facilitate interpretation of the main effects as these are roughly the mean increases among low-income districts that underwent reforms. Results are based on 2SLS/IV models that include: parent's relative rank in income distribution, school district fixed effects, race-specific year of birth fixed effects, race*census division-specific birth year fixed effects; controls at the county-level for the timing of school desegregation*race, hospital desegregation*race, roll-out of "War on Poverty" & related safety-net programs (community health centers, food stamps, medicaid, AFDC, UI, Title-I (average during childhood yrs)), timing of state-funded Kindergarten intro and timing of tax limit policies; controls for 1960 county characteristics (poverty rate, percent black, education, percent urban, population size, percent voted for Strom Thurmond in 1948 Presidential election*race (proxy for segregationist preferences)) each interacted with linear cohort trends; and controls for childhood family characteristics (parental income/education/occupation, mother's marital status at birth, birth weight, gender). The first-stage model include as predictors the school-age years of exposure to school finance reform interacted with the quartile of the respective school district's predicted reform-induced change in school spending based on the timing and type of court-ordered reform interacted with 1970 (within-state) district income and spending percentile categories. There exists a significant first-stage.

Table 4. Interactive effects of Head Start spending and school desegregation on intergenerational mobility

	DEPENDENT VARIABLE: GENERATIONAL CHANGE IN RELATIVE RANK IN INCOME DISTRIBUTION
	ALL KIDS
	(1)
County Head Start spending per 4-year old$_{(age\ 4)}$ (in 000s)	0.1459+
	(0.0978)
Years of desegregation exposure$_{(age\ 5–17)}$ * Head Start spending per 4-year old$_{(age\ 4)}$ * black	0.1333*
	(0.0714)
Years of desegregation exposure$_{(age\ 5–17)}$ * Head Start Spending per 4-year old$_{(age\ 4)}$ * white	0.2066*
	(0.0)
F-TEST OF JOINT SIGNIFICANCE OF HEAD START SPENDING VARIABLES: P-VALUE <0.01	
Number of individuals	8,091
Number of childhood families	3,733
Number of school districts	1,190

Robust standard errors in parentheses (clustered at school district level)
Note: *** p<0.01, ** p<0.05, * p<0.10
Data: PSID geocode data (1968–2013), matched with childhood school and neighborhood characteristics. Analysis sample includes all PSID individuals born in 1950s and 1960s, followed into at least their 30s through 2013.
Models: Head Start spending per 4-year old in the county is centered around $5,000 (and measured in 000s) and school-age years of desegregation exposure is centered around 12, to facilitate interpretation of the main effects as representing the mean effects of Head Start spending when it is followed up with exposure to desegregated schools throughout one's K-12 years. The main desegregation exposure variables are included in model (non-parametric specification) but suppressed in table—see event study figure B to view effects of school desegregation on mobility by race (which are evaluated at mean Head Start spending among low-income districts that had Head Start programs). Results are based on models that include controls for: parent's relative rank in income distribution, school district fixed effects, race-specific year of birth fixed effects, race*census division-specific birth year fixed effects; controls at the county-level for the timing of school desegregation*race, hospital desegregation*race, roll-out of "War on Poverty" & related safety-net programs (community health centers, county expenditures on Head Start (at age 4), food stamps, medicaid, AFDC, UI, Title-I (average during childhood yrs)), timing of state-funded Kindergarten intro and timing of tax limit policies; controls for 1960 county characteristics (poverty rate, percent black, education, percent urban, population size, percent voted for Strom Thurmond in 1948 Presidential election*race (proxy for segregationist preferences)) each interacted with linear cohort trends; and controls for childhood family characteristics (parental income/education/occupation, mother's marital status at birth, birth weight, gender).

pre-school programs, it accelerates child development, enhances school readiness and educational achievement, and leads to significantly greater likelihood of upward mobility prospects later in life.

Summary Discussion and Conclusions

The key contributions of this study are three-fold.

First, the paper provides a more detailed descriptive portrait of intergenerational economic mobility in the United States.

Second, the paper attempts to explain why black-white mobility differences narrowed significantly for successive cohorts born between 1955 and 1979, with a focus on the role of three major equal educational opportunity policies pursued over this period: school desegregation, school finance reforms, and roll-out and expansions of Head Start, improving the understanding of the intergenerational mobility process in the United States and illuminating the central role schools play in the transmission of economic success from one generation to the next.

Third, the paper emphasizes differences in early education and school quality—in particular, Head Start and school spending—as important components of the persistence in income across generations.

Indeed, schools—and policies that influence their optimal functioning—are transformative agents that either provide or deprive children of the opportunity to reach their full potential. These equal educational opportunity policies were instrumental in the making of a growing black middle class. The evidence shows that the footprints of paths toward upward mobility are preceded by access to high quality schools beginning in early childhood through 12th grade. These school reforms expanded on-ramps to poor and minority children to get on that path.

Evidence on the long-term productivity of education spending demonstrates that equal education policy initiatives can play a pivotal role in reducing the intergenerational transmission of poverty. ■

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Rebound Neighborhoods in Older Industrial Cities: The Case of St. Louis

TODD SWANSTROM
University of Missouri-St. Louis

HENRY S. WEBBER
Washington University in St. Louis

MOLLY W. METZGER
Washington University in St. Louis

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Neighborhoods in American cities are changing all the time. A study of 35 metropolitan areas from 1950 to 2000 found dramatic change in the economic status of neighborhoods, with the relative economic status of an average census tract moving up or down about 13 percent per decade (Rosenthal 2007). Researchers have extensively studied the causes and consequences of neighborhood decline. Research on revitalizing or rebounding neighborhoods is less extensive but growing. A recent study of over 50,000 census tracts between 1970 and 2009 classified between 13.6 percent and 20.6 percent in each decade as "ascending" (Owens 2012).[1] Even in the most distressed older industrial cities some neighborhoods are doing quite well. Fueled by the growth of relatively high-paid professional jobs in urban cores and the growing demand of young professionals for exciting, pedestrian-friendly urban environments, many urban neighborhoods are rebounding from decline (Ehrenhalt 2012; Leinberger 2008).

The term most often used to describe ascending urban neighborhoods is "gentrification." The dominant view in the literature is that gentrification is harmful to the long-time low-income and minority residents of the area. Burdened by rising rents and taxes, critics argue, long-time residents are forced to move out of the neighborhood, severing social ties and paying more for replacement housing. Even if they are able to remain, affluent newcomers can push longtime residents to the economic, cultural, and political margins of the community. Retail outlets catering to the luxury consumption patterns of the newcomers, for example, replace stores meeting the basic needs of longtime residents.[2]

The critical view of gentrification depicts neighborhood change not as the result of housing markets in equilibrium continually bringing supply and demand into balance. Rather, according to Neil Smith's "rent gap" thesis (1979; 1986), gentrification is driven by the gap between land rents realized under existing land uses and the land rents that could be charged if the land were converted to higher value luxury consumption. Large rent gaps make gentrification occur suddenly—like a rubber band snapping back after being stretched. Rent gap theory implies that gentrification is not an alternative to neighborhood decline

1 Owens defines ascending census tracts as those that increased their rank in the metropolitan area on her indicators of socioeconomic status by 10 percentile points or more.

2 For a synthesis of the literature on gentrification that stresses its negative effects, see Lees, Slater, and Wyly 2008.

but in fact declining and ascending neighborhoods are complementary. Rebound requires decline.

The critical view of gentrifying neighborhoods is also rooted in sociological tipping point theory. According to racial tipping point theory, once a neighborhood reaches a certain threshold of black population, whites will begin to panic and flee the neighborhood en masse (Grodzins 1957; Schelling 1969; 1971). The critical view of gentrification implies a kind of reverse tipping process: as a minority neighborhood experiences an influx of whites it could reach a tipping point where people of color would feel unwelcome and the area quickly would transition to all-white. A similar process could be hypothesized for an influx of affluent households. One of the basic explanations of "gentrification" is that it occurs in proximity to growing clusters of professional employment in the central business districts of major cities. This increased demand for housing concentrates in nearby neighborhoods with historic architecturally significant housing stock and urban amenities. Once a critical threshold of affluent households has been reached, market behavior could become infected by "contagion effects," or what might be called "panic buying," causing rapidly rising housing values that force out low-income residents.

Besides economic and social processes driving gentrification, critics argue that public policies play a key role. Through public investments in infrastructure, zoning changes, repeal of rent control, tax abatements, and other subsidies, local governments have accelerated gentrification and the displacement of low-income and minority residents.[3] Research has also documented how federal programs, such as HOPE VI, have been used to reduce the number of public housing units, contributing to gentrification of valuable urban real estate (Goetz 2013).

But the view that an influx of higher income residents and new investment necessarily harms long-time low-income and minority residents is far from universal. To some scholars, neighborhood ascendancy is characterized as "revitalization." Some researchers have found that gentrifying neighborhoods do not have higher rates of involuntary displacement than other neighborhoods. Even if revitalization leads to rising rents, neighborhood uplift can benefit longstanding low-income and minority residents by improving the quality of life in the area, providing, for example, more retail outlets and local job opportunities (Freeman 2002; 2006; Vigdor 2002; Hartley 2013).

Moreover, neighborhoods with a strong social fabric may be able to resist displacement from gentrification pressures. Strong "social capital" has been correlated with neighborhood stability (Temkin and Rohe 1998). Mixed-income and mixed-race neighborhoods exist and have been correlated with strong

3 Under so-called "third-wave gentrification," beginning in the 1990s, governments in league with corporate interests became more involved in directly promoting gentrification (Lees, Slater, and Wyly 2008, 178–9).

social networks that cut across racial and economic divides (Nyden, Maly, and Lukehart 1997). A study of West Mount Airy, Philadelphia, for example, found that strong social organization in the neighborhood, led by the churches, played a key role in enabling the neighborhood to maintain its racial diversity while improving economically (Ferman, Singleton, and DeMarco 1998).

Finally, public policies can be used to protect the interests of long-time residents in revitalizing urban neighborhood from forced relocation. Housing production trust funds, rent controls, tax refunds, right of first refusal on condominium conversions, and the use of low-income housing tax credits (LIHTC), and Housing Choice Vouchers (also known as "Section 8") can be used to enable residents to remain in neighborhoods that are trending upward. Community Development Corporations (CDCs) are often credited for representing the interests of longtime residents to remain in the neighborhood as it rebounds through land trusts, limited-equity coops, and expanding the supply of nonprofit housing.[4]

In short, the scholarly literature has developed two contrasting models of ascending or what we call "rebound neighborhoods." The critical view, associated with the term "gentrification," posits that ascending neighborhoods almost invariably harm low-income and minority residents. A more favorable view, associated with the term "revitalization," maintains that ascending urban neighborhoods do not necessarily harm and may even benefit long-time low-income and minority residents.

This paper explores whether the gentrification or revitalization model best describes the process of neighborhood ascendency in St. Louis, Missouri. Almost all of the research on ascending neighborhoods has focused on strong market cities on the two coasts, such as New York and Seattle. In contrast, St. Louis is an older industrial "weak housing market" metropolitan area. A weak housing market is often defined as a market where the ratio of median house price to median household income is less than 3:1. Among the largest 25 metropolitan areas in the United States, St. Louis had the fifth lowest ratio of median housing price to median income (2.85) (American Community Survey 2013).[5] Compare this to ratios of 7.8:1, 7.7:1, and 6.1:1 in the Los Angeles, San Francisco, and New York City metropolitan areas, respectively. Moreover, St. Louis is a sprawled-out metropolitan area where the number of new housing units built on the suburban fringe has consistently outpaced the growth of new households, leading to housing vacancy and abandonment in the urban core (Bier and Post 2003).

4 Critics of CDCs argue that they often promote disruptive gentrification (Stoecker 1997). For a defense of CDCs see the rejoinders to Stoecker by Rachel Bratt and Dennis Keating in the same volume.

5 Median house value for all owner-occupied units = $159,700 (2013 dollars)/ median household income = $54,109 (2013 dollars). American Community Survey, retrieved from Social Explorer, tables ACS 2013, 1-Year Estimates, SE.

Older urban neighborhoods are essentially forced to "run up a down escalator"—though this escalator has slowed in recent years with renewed interest in urban living by young, educated professionals and empty nesters. Much research suggests that the gentrification model well describes neighborhood ascendancy in strong market cities. What is unclear is whether the same conclusions would hold in weak market cities like St. Louis.

This data analysis is guided by these two contrasting models of ascending urban neighborhoods. Findings do not indicate that it is either possible or desirable, however, to "test" individual hypotheses about neighborhood change in classic social science fashion. For example, findings do not show that it is possible to test the reverse tipping point hypothesis, i.e., that the influx of white higher-income households into low-income minority neighborhoods reaches a point where the neighborhood inevitably becomes all white and high income. It would be impossible to isolate the independent variables (percent white and high income) while holding all other variables constant. Neighborhoods are open systems influenced by *intertwined* economic, social, and political forces; everything varies together. Using the "gold standard" of scientific research to isolate and test causal variables could actually distort reality by isolating variables that cannot be understood apart from their interactions with each other. This paper follows Robert Sampson's advice to work toward a "contextual social science" (Sampson 2012, 382–83). Neighborhood change needs to be understood in a holistic and interdisciplinary fashion; causal relationships can vary from one context to another.[6]

In order to explore the issue of how neighborhood ascendancy affects low income and long-term residents, within the limits of available data and methodology, this paper pursues the following descriptive questions: *How widespread are rebound neighborhoods in St. Louis metropolitan area? Are rebound neighborhoods a major or minor trend, i.e., do they have the potential to slow down or even reverse longstanding urban population decline and disinvestment? Finally, do rebound neighborhoods in St. Louis more closely resemble the critical view of gentrification or the more benign model of neighborhood revitalization?*

Data and Methods

Following a common practice, census tract data is used to trace neighborhood change. In order to track neighborhood trends over time, the data set extends over a 40-year period (1970 to 2010).[7] To ensure that uniform

6 For an extended version of this analysis, including qualitative case studies of five rebound neighborhoods, see Webber and Swanstrom (2014).

7 The most recent period uses the American Community Survey. Years 2008 through 2012 are combined in order to disaggregate to the census tract level. This is referred to by the mid-year, 2010.

geographies are tracked across time, the US2010 Longitudinal Tract Data Base (LTDB) is used, which normalizes data for each census into 2010 tract boundaries.[8] This paper focuses on urban neighborhoods that have revived after periods of economic stagnation or decline. It does not examine rural areas that improved socioeconomically when new suburban development occurred. For this reason, the data base consists of all 218 census tracts in the "urbanized area" of St. Louis in 1950 as defined by the U.S. Census Bureau (figure 1).[9] In 1950, the study area represented 55.6 percent of the metropolitan area population; by 2010 that had declined to 28.4 percent as the population sprawled out into distant suburban counties. These post-1950 suburban areas are not included in this neighborhood analysis.

In order to identify rebound neighborhoods, a three-part index is used based on: (1) median home value, (2) median rent, and (3) per capita income.[10] The Rebound Index (RI) is a tract-level simple additive index of standardized scores (Z-scores) for these three variables. For each variable, a standardized score (Z) is computed by subtracting the variable's mean value ($\bar{x}$) from the variable's observed value (x) and dividing by the standard deviation (s). Expressed symbolically:

$$Z=(x-\bar{x})/s$$

The resulting standardized scores are then summed, so that for every tract:

$$RI= Zi+Zp+Zo$$

Where RI is the Rebound Index, Zi is the Z-score of housing values, Zp is the Z-score of rent, and Zo is the Z-score of per capita income. This calculation provides a measure of how the census tract did relative to the mean score for all 218 census tracts for that year.

8 More information is at Brown University, "Census geography: Bridging data from prior years to the 2010 tract boundaries," **www.s4.brown.edu/us2010/Researcher/Bridging.htm**.

9 The urbanized area generally consists of contiguous territory that is part of a metropolitan area of at least 50,000 people that has a density of at least 1,000 persons per square mile. For a more complete explanation of how the Census Bureau defines urbanized area see U.S. Bureau of the Census, Urban and Rural Definitions, October 1995, **www.census.gov/population/censusdata/urdef.txt**. Only census tracts that were wholly within the urbanized area as of 1950 were included; small parts of the urbanized area in 1950, therefore, are not included in the data set.

10 The authors note that this paper accounts for the weaknesses of using census data to track housing values. The Census Bureau asks respondents to estimate how much their home is worth. The median home values used in this paper are therefore based on perceptions not actual sales. Respondents may overestimate values when prices are going up and underestimate when prices are declining. However, the data reasonably accurately track differences between neighborhoods across extended periods.

"Ascending tract" is defined as any census tract that moved up at least 10 percentile points in the rankings.[11] Descending neighborhoods are the mirror image of rebound neighborhoods, that is, census tracts that descended 10 percentile points or more in the rankings. This paper differentiates neighborhoods using a relative, not an absolute, measure of performance in order to focus on how they are doing after controlling, as much as possible, for the common challenges facing all older neighborhoods in the region. As described below, 1970–2010 was a period of sharp decline in St. Louis and most neighborhoods declined. Despite these daunting regional head winds, nearly every ascending tract improved in absolute terms on all three scores from 1970 to 2010 (controlling for inflation).

This paper uses a typology of six different types of neighborhoods based on their trajectory—ascending, stable, and descending neighborhoods—and where they end up ("high" being those in the top 50 percent and "low" being those in the bottom 50 percent). Based on the results of the Rebound Index, all 218 census tracts in the urban core are divided into six categories:

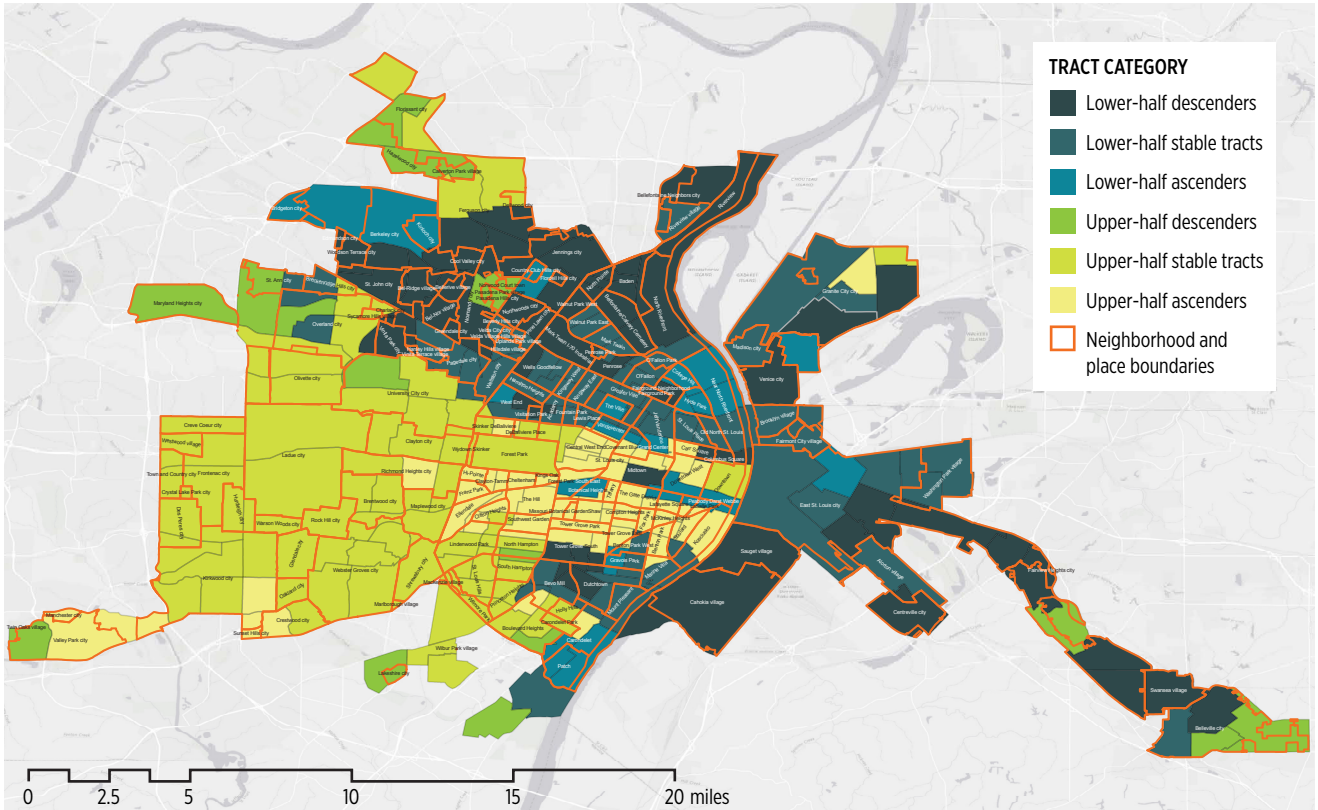
1. Ascending high, or "rebound neighborhoods" (35 tracts; 102,060 population)
2. Ascending low (16 tracts; 42,264 population)
3. Stable high (59 tracts; 235,480 population)
4. Stable low (51 tracts; 137,874 population)
5. Descending high (15 tracts; 67,725 population)
6. Descending low (16 tracts; 155,316 population)

Figure 1 shows the distribution of the different neighborhood types across the study area. The term "rebound neighborhood" is reserved for ascending tracts that both moved up at least 10 percentile points and ended in the upper half of the distribution.[12] Rebound neighborhoods are then compared with the other neighborhood types across a range of economic, social, and political variables in order to examine precursors and patterns of neighborhood change.

11 A tract that moved up in the 1990s was eliminated if it moved down in the 2000s.

12 Sixteen census tracts ascended 10 percent or more but still ended up in the bottom 50 percent of tracts. We do not believe that neighborhoods in the bottom half can be truly be called "rebound neighborhoods." Also, a cluster analysis was performed using 10 noneconomic variables. The cluster analysis showed that "low rebound" tracts have different demographic and social characteristics from high rebound tracts. For this reason this analysis focuses on ascending tracts in the upper half of the distribution.

Figure 1. Map of study area by census tract



Results

Neighborhood Change: Initial Findings

Table 1 shows conditions in the typical census tract in the study area from 1970 to 2010. The results here are clear: The period from 1970 to 2010 was a time of great change and considerable decline in the core of the St. Louis region. The population of the median census tract fell 39.1 percent. The median poverty rate increased from 14.6 percent to 20 percent. Per capita income, after falling precipitously in the 1970s, grew steadily from 1980 to 2010. Rents and housing prices increased modestly. Adjusted for inflation, the median home value in the typical (median) census tract increased just over 1 percent per year, while rents increased by only about 0.3 percent per year.

Behind these overall trends, however, are great differences across neighborhoods. Table 2 shows the condition of the typical or median census tract for each of the six categories in 2010. The differences are considerable. In 2010 median home values ranged from $73,200 to $190,500, per capita income varied from $13,029 to $33,328, and the aggregate poverty rate ranged from 8.7 percent to 33.8 percent.

In order to understand neighborhood dynamics, this paper examines how different categories of neighborhoods performed over time. Table 3 presents changes from 1970 to 2010 by neighborhood type. The results are striking: In upper-half ascenders (rebound neighborhoods) median per capita income grew

Table 1. Neighborhood changes in the St. Louis region's urban core, 1970–2010

	1970	1980	1990	2000	2010	CHANGE: 1970–2010
Home values (median)	$76,541	$76,496	$87,375	$79,851	$110,600	$34,059
Rent (median)	$468	$371	$472	$474	$531	$63
Per capita income (median)	$23,596	$17,527	$19,012	$20,881	$21,387	$(2,209)
Census tract population (average)	6,047	4,813	4,317	3,923	3,679	-2,369
Black population % (aggregate)	26.9%	33.8%	36.3%	40.5%	40.6%	13.6%
Poverty rate (aggregate)	14.6%	16.1%	18.0%	18.0%	20.0%	5.3%

Note: All dollar figures are CPI-adjusted to 2010 dollars.

by 23.4 percent over the 40 years, adjusted for inflation. By contrast, median per capita income fell by over 30 percent in all lower half neighborhoods combined. Housing values increased in every neighborhood category but they went up over 3 percent a year in rebound neighborhoods compared to almost no increase in lower-half descending neighborhoods.

Table 2. Neighborhood status in St. Louis's urban core, 2010

	UPPER-HALF ASCENDERS	LOWER-HALF ASCENDERS	UPPER-HALF STABLE TRACTS	LOWER-HALF STABLE TRACTS	UPPER-HALF DESCENDERS	LOWER-HALF DESCENDERS
Home values (median)	163,200	73,500	190,500	73,200	124,500	81,500
Rent (median)	563	496	721	441	581	470.5
Per capita income (median)	27,866	13,029	33,328	13,540	24,788	16,293
Census tract population (average)	3,074.89	2,643.19	4,445.86	3,028.59	4,346.13	3,977.14
Black population % (aggregate)	30.47%	77.64%	12.20%	76.94%	27.35%	69.00%
Poverty rate (aggregate)	18.95%	36.23%	8.67%	33.76%	12.78%	27.83%
Total population	107,621	42,291	262,306	154,458	65,192	167,040

Note: All dollar figures are CPI-adjusted to 2010 dollars.

Table 3. Neighborhood status in St. Louis' urban core: percent changes, 1970–2010

	UPPER-HALF ASCENDERS	LOWER-HALF ASCENDERS	UPPER-HALF STABLE TRACTS	LOWER-HALF STABLE TRACTS	UPPER-HALF DESCENDERS	LOWER-HALF DESCENDERS
Home values (median)	124.40%	46.84%	89.21%	21.13%	27.54%	3.35%
Rent (median)	35.37%	49.84%	6.71%	15.85%	-15.32%	-3.59%
Per capita income (median)	23.40%	-35.10%	11.28%	-31.58%	-1.13%	-31.49%
Census tract population (average)	-44.50%	-62.65%	-22.61%	-53.60%	-14.27%	-36.56%
Black population % (aggregate)	63.98%	91.91%	115.89%	62.56%	1,149.19%	216.98%
Poverty rate (aggregate)	12.67%	46.13%	29.78%	74.48%	164.10%	149.77%
Total population	-44.50%	-62.65%	-22.61%	-53.60%	-14.27%	-36.56%

Note: All dollar figures are CPI-adjusted to 2010 dollars.

The Regional Geography of Neighborhood Change

Figure 1 shows the location of the six types of neighborhoods in the urban core. The six neighborhood types are not randomly distributed across the landscape; neighborhoods with similar trajectories tend to cluster together. The story of neighborhood change in St. Louis is a story of place.

One of the most striking patterns is that nearly all of the ascending, or rebound, tracts (yellow) are located in what is called the Central Corridor.[13] Much of the success of rebound neighborhoods can be attributed to their locational advantage. Over the past 40 years, the major growth in jobs in St. Louis, like many cities, has been in health care and higher education. The largest health care and education providers in St. Louis are located in the Central Corridor, including Barnes Jewish Hospital, Washington University, and Saint Louis University. This part of the city is notable for a variety of high-quality, architecturally distinctive housing, walkable neighborhoods, a mix of uses, and a plethora of urban amenities, including one of the nation's great urban parks, which contains within it the St. Louis Zoo, the Missouri History Museum, the St. Louis Art Museum, and the St. Louis Science Center and Planetarium. The region's light rail system runs down the heart of the Central Corridor (Bryant 2014).

Lower-half descender neighborhoods (dark blue), the areas in sharpest decline in our study, generally do not border on rebound neighborhoods. They are located at the northern extremes of St. Louis City and across the city border in the suburbs of St. Louis County, as well as in the far eastern suburbs on the Illinois side of the metropolitan area. Included are many of the neighborhoods surrounding Ferguson, Missouri, where unrest occurred following the shooting of Michael Brown. Clearly, poverty is moving to the suburbs (Kneebone and Berube 2013). Predominantly white and middle class in 1970, these neighborhoods are now more than two-thirds African American and their aggregate poverty rate has soared to 27.8 percent. Many of these areas were settled in the 1940s and 1950s as housing for white and blue collar workers in St. Louis industries. As those industries declined, these communities destabilized.

Primarily located in north St. Louis City north of the rebounding neighborhoods in the central corridor and in East St. Louis, *lower-half stable* census tracts (middle blue) have the second highest poverty rate (33.8 percent) of the six neighborhood types and declining per capita income. Located in the manufacturing belt of the city, these neighborhoods have been hurt by the decline of industrial jobs. Spillover effects from rebound neighborhoods may help account for their modest increases in housing values and rents. Many *lower-half*

13 The Central Corridor is generally defined as the area between downtown and the river west to I-170, bordered on the south by I-44 and on the north by Delmar Boulevard and Washington Avenue.

ascending neighborhoods (lighter blue) are also located near the rebounding neighborhoods in the Central Corridor, which may help explain why their home values and rents increased over the 40-year period.

Upper-half stable neighborhoods (light green) are located almost entirely in the suburban areas south and west of the City of St. Louis with a small presence in the southwest section of the City of St. Louis. Included in this category are the most prestigious and wealthiest towns in the region. Home ownership rates in upper half stable neighborhoods have been around 75 percent since 1970. While the African American percentage of residents in these neighborhoods has grown, it remains relatively low (12.2 percent). With a strong housing stock, a growing commercial center in the suburban town of Clayton, and easy access to growing business centers in the western suburbs, this category of census tract is the strongest in the region.

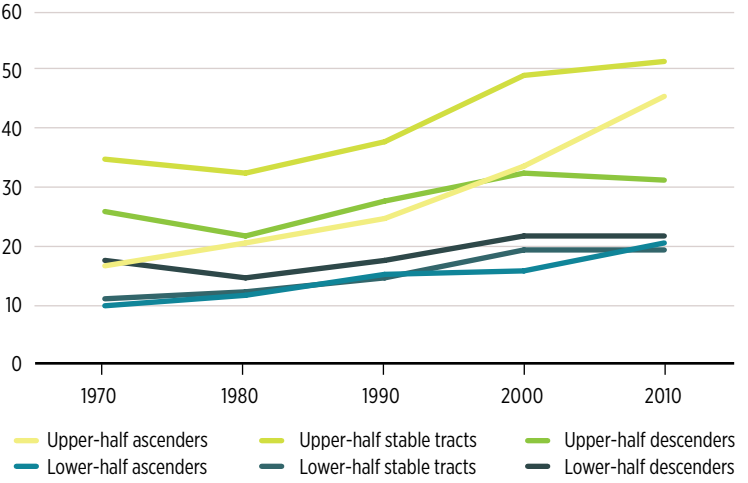
Scattered throughout the region, the *upper-half descender* category (green) is the only category without a clear geographical pattern. Some of the upper half descenders are contiguous with upper half stable neighborhoods while others are next to lower half descending neighborhoods. They are generally located outside the City of St. Louis, with many on the outer edges of the study area. In 1970, the upper half descenders had the smallest percent African American population of any category, but black population has now increased to 27.4 percent. Over the 40-year period, per capita income remained about stable and housing prices increased modestly.

Rebound Neighborhoods: Pathways and Outcomes

This paper's primary focus is on upper half ascender neighborhoods, or rebound neighborhoods. Rebound neighborhoods are not widespread; only 13.5 percent of the population of the urban core lives in rebound neighborhoods. The question remains, however: How significant are rebound neighborhoods for the future of the region? Do rebound neighborhoods generate broad benefits for residents of older neighborhoods or is rebound largely a zero-sum game in which some neighborhoods benefit at the expense of others and long-time residents are displaced by rising housing costs? These important, but difficult-to-answer questions can be addressed by comparing rebound neighborhoods to the other five types.

Clearly, economic forces of supply and demand go far toward explaining rebound neighborhoods. As discussed in the previous section, most rebound neighborhoods are located in the Central Corridor in St. Louis where the growth of professional jobs has been concentrated. As figure 2 shows, rebound neighborhoods are characterized by significant growth in the percent of the civilian labor force in professional occupations. This result is predicted by

Figure 2. Percent of local workforce employed in professional occupations, 1970–2010

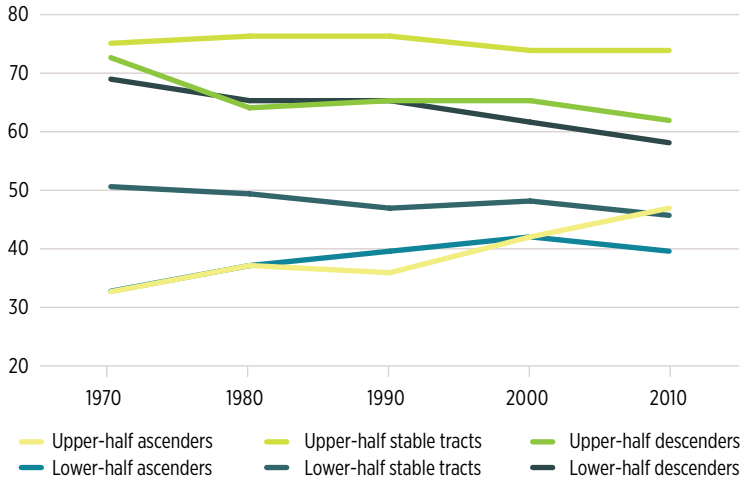


both the gentrification and revitalization models. Neighborhood ascendancy is often based on an increasing demand by urban professionals for housing near employment centers. Rebound neighborhoods have "come back" both in relative and absolute terms, reflected in significant inflation-adjusted increases in home values, rents, and per capita income. Market confidence has been restored to neighborhoods that suffered precipitous losses in the 1970s. The vacancy rate in rebound neighborhoods increased by an average of 1.5 percent, but that figure is significantly lower than the 3.4 percent increase for all census tracts in our study area.[14] As figure 3 shows, rebound neighborhoods (upper half ascenders) are the only ones that witnessed an increase in the homeownership rate in the 2000s.

Clearly, rebound tracts are doing well, but many question whether economic success for some can cause problems for others, with rising home values and rents pushing out existing residents. Using an index based on home values, rents, and per capita income, it is inevitable that residents of rebound neighborhoods will experience upward pressure in housing costs. Surprisingly, though, rebound neighborhoods did not experience a steep drop in low-income households. In fact, the number of poor people in these rebound neighborhoods declined, on average, by only 18 persons per census

14 Unless otherwise noted, the figures are averages across census tracts unweighted by population.

Figure 3. Homeownership rate, 1970–2010



tract between 2000 and 2010 (though as discussed below, the decrease in the black population over that same decade was more significant). Rebound tracts had the highest level of income diversity among all neighborhood types. Based on an income diversity index using three roughly equal categories of income, rebound tracts averaged the highest score (.649) compared to an average of .625 for all tracts.[15]

While housing costs are rising in rebound tracts, rents in these neighborhoods are still relatively affordable. Average monthly rents increased a hefty 20.4 percent between 2000 and 2010 in rebound tracts, but the median contract rent in the median rebound census tract rose to only $563 per month. Assuming that utilities cost $150 per month, using the common standard that households should not spend more than 30 percent of their income on housing, the median apartment in these rebound tracts would be affordable to families making $28,235 a year, or 52 percent of the 2013 median family income for the metropolitan area.[16] Compared

15 Income diversity is measured using three income ranges and measuring how far the tract falls from having an equal number in each category. Using the Gini Index of Inequality, which measures the degree of income spread within census tracts, this rebound tracts scored .450, the second highest among the six types of neighborhoods.

16 St. Louis metropolitan statistical area median family income was $54,449 in 2013 (American Community Survey, one-year estimates; retrieved from Social Explorer).

to other regions, housing unaffordability in St. Louis is driven more by low incomes than by high rents.

Subsidized housing also plays an important role in the continued economic diversity of rebound neighborhoods. According to analysis of subsidized housing, which combined counts of LIHTC units and Housing Choice Vouchers, rebound neighborhoods account for 15 percent of the region's occupied housing units, but 27 percent of its subsidized units (figure 4).[17] By comparison, the upper half stable neighborhoods accounted for 34 percent of all occupied housing units, but only 11 percent of subsidized units. Neither LIHTC nor Housing Choice Vouchers is a permanent supply of affordable housing in a changing neighborhood, but the existence of a solid amount of subsidized units suggests that some affordability could be sustained in the rebound neighborhoods.

Rebound neighborhoods are not just driven by the economics of supply and demand but by social forces, as well. Race plays a crucial role. For example, neighborhoods that were predominantly African American in 1970 had a slim chance of rebounding.[18] Figure 5 shows the distribution of rebound neighborhoods by percent African American in 1970. Twenty times as many predominantly white neighborhoods (more than 90 percent) rebounded than predominantly black (more than 90 percent) neighborhoods. Only five out of 35 rebound census tracts were majority black in 1970.

It is not just the racial composition of the census tract that matters. Every one of the majority African American census tracts in 1970 that rebounded over the next 40 years was located in the Central Corridor, surrounded by white or racially diverse neighborhoods. *Not a single majority black neighborhood in 1970 that was surrounded by other black neighborhoods rebounded in the subsequent decades.* In short, what matters is not just the neighborhood but the "neighborhood of the neighborhood." Being located in north St. Louis City or County is a huge structural disadvantage.

Although majority black areas had a small likelihood of rebounding, racial diversity at ranges below 50 percent black was not a major barrier to rebounding. As figure 6 shows, rebound neighborhoods were almost completely white in 1970, averaging less than 1.5 percent African American. Over the next 30

17 The authors recognize that some Section 8 units may be in LIHTC developments. LIHTC has a 15-year minimum compliance period, so the authors are confident that most of the units counted over the 15-year period still housed low-income families at the end of the period. Of course, there are many other programs that provide affordable housing to specific groups, such as elderly and veterans, which were not counted.

18 In a study of Chicago, Hwang and Sampson conclude that when a neighborhood is greater than 40 percent African American, other things being equal, gentrification is highly attenuated (2014). See also Florida (2014).

Figure 4. Share of occupied and subsidized units by neighborhood type, 2013

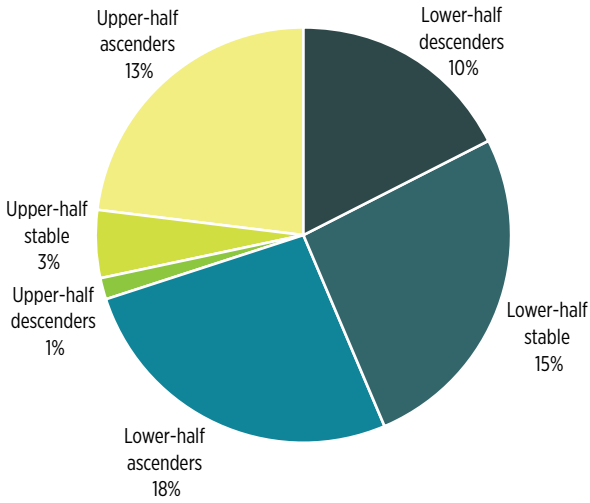


Figure 5. Rebound tracts by percent African American, 1970

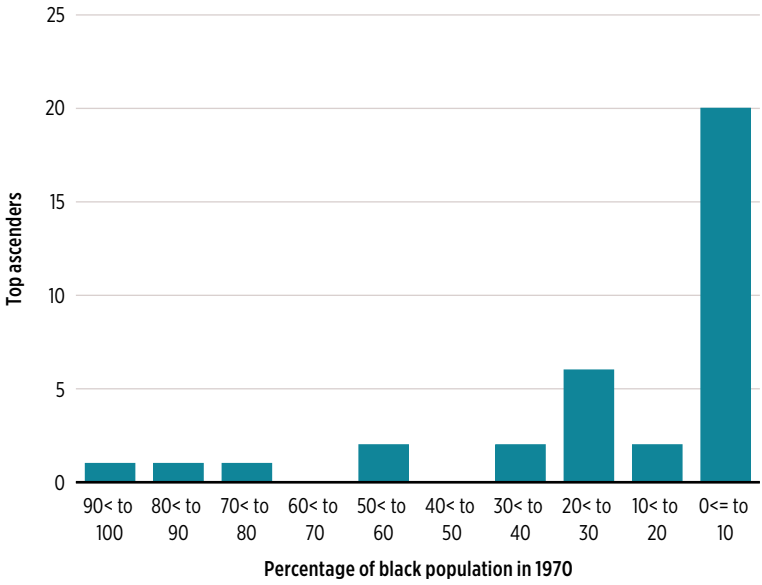
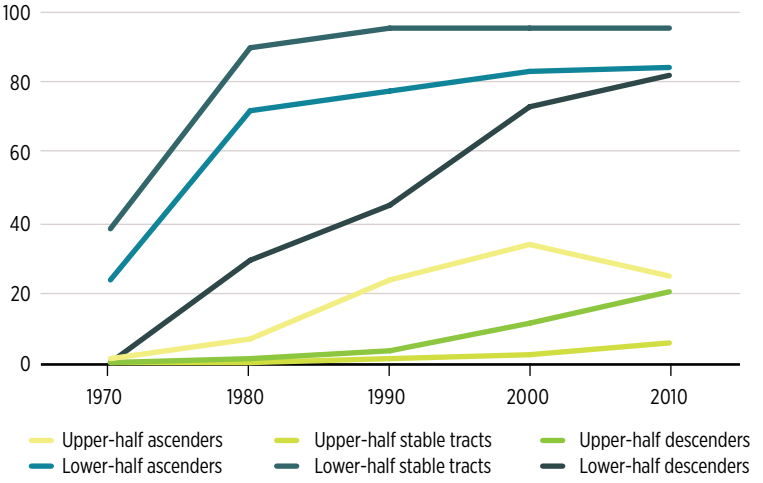


Figure 6. Percent African American by neighborhood type, 1970–2010



years the Black population in these census tracts grew rapidly—to an average of 34.7 percent in 2000. Contrary to racial tipping point theory, many neighborhoods that had experienced rapid growth of minority population experienced economic uplift. Instead of tipping over into all-black neighborhoods, they experienced a moderate decline in African American population; notably, rebound neighborhoods were the only neighborhood category that had a decline in percentage African American from 2000 to 2010. From 2000 to 2010 rebound census tracts experienced an average loss of 250 black residents. It is not clear whether black households were pushed out and/or pulled by better opportunities. There may indeed be pressures pushing blacks out of rebounding neighborhoods, echoing the critical view of gentrification (Bologna et al. 2015). Despite the loss of black population, however, rebound neighborhoods remained the most racially diverse of all six neighborhood types in 2010 (table 4).[19]

In sum, rebound neighborhoods in St. Louis do not resemble the neighborhoods depicted in the critical literature on gentrification, and evidence

19 The racial diversity index is calculated using six racial categories with the highest score possible when all six categories have the same percentage of the population. The formula is basically one minus the sum of the squares of all the racial percentages for each tract.

Table 4. Racial diversity index by neighbhorhood type, 2010

NEIGHBORHOOD TYPE	RACIAL DIVERSITY INDEX
Upper-half ascenders	0.474
Lower-half ascenders	0.284
Upper-half stable	0.216
Lower-half stable	0.073
Upper-half descenders	0.460
Lower-half descenders	0.251

does not support the rent-gap thesis (see also Monti and Burghoff 2012). The neighborhoods that rebounded in St. Louis were not the ones that had fallen to the lowest rents but rather areas in the Central Corridor that declined in the 1970s and 1980s but had still retained substantial strengths. Ascending neighborhoods do not rise out of the most deprived neighborhoods, as rent-gap theory would predict. The influx of higher income white professionals has not caused rents to soar to the point that poor populations are displaced entirely. The black population in rebound neighborhoods is declining, which is a cause for concern, but rebound neighborhoods remain the most economically diverse neighborhoods in the region. This is very different from hot market metros where rising housing costs can push families—not just out of neighborhoods—but out of the city entirely.[20] This pattern may change in the future and St. Louis may come to resemble hot market cities like San Francisco and Boston where housing costs are a huge burden for the average household, but that is not the current reality.

Persistent Poverty

Rebound neighborhoods are evidence that, given concerted investment in affordable housing, it is possible to sustain diverse neighborhoods. This is good news for the region. But other analysis suggests deep concerns. While rebound neighborhoods were home to 107,621 residents in 2010, in that same year well over 300,000 people lived in lower half descending or stable tracts. These census tracts have a median home price under $80,000, an average per capita income of roughly $15,000, and a poverty rate of roughly 30 percent. Moreover, as of the last decennial census, these neighborhoods are not showing signs of ascending.

20 "Gentrification on a city scale, or interjurisdictional gentrification, is much more damaging in that it moves low-income people not only to other neighborhoods, but also to other *cities*, which are often underequipped to provide needed social services" (Powell 2002, 93).

It should be noted that the method used to identify ascending and descending neighborhoods on a relative scale is biased toward finding equal numbers, at least of census tracts, in the two categories. For every census tract that goes up in the ranking, by definition, another census tract must go down. An absolute standard for identifying ascending and descending neighborhoods would allow for greater differentiation in the size of ascending and descending areas. For instance, Cortright and Mahmoudi (2014) examined how many census tracts ascended from high poverty to low poverty compared to how many descended from low poverty to high poverty over the period 1970 to 2010. Across the 51 large metropolitan areas studied, only 105 census tracts transitioned from high poverty (over 30 percent) to low poverty (under 15 percent); by contrast, 2,428 census tracts transitioned from low poverty to high poverty (Cortright and Mahmoudi 2014). Similar results are found for the geography studied in St. Louis: Only 5,816 people live in census tracts that transitioned over the 40-year period from high poverty to low poverty, whereas 98,953 live in neighborhoods that became newly poor during that period. Using this method, 17 times as many people live in descending tracts than in ascending tracts.

If gentrification is defined as relatively poor areas that experience an influx of affluent households pushing out the poor, gentrification is not a widespread phenomenon in St. Louis. The more prevalent problem is not middle class and affluent households moving *toward* the poor and pushing them out, but that rather moving *away from* the poor, leaving behind resource-poor neighborhoods burdened by concentrated poverty.

Discussion: Policy Implications

The major challenge of St. Louis is that of deep concentrated poverty, poverty that shows no signs of abating. While there are areas of progress, large sections of the region continue to decline. St. Louis has been a slow-growth region for many years. St. Louis has slow wage growth, slow population growth, large disparities in income by race, no natural barriers to regional

Table 5. Population and percent of population by neighborhood type, 2010

	UPPER-HALF ASCENDERS	LOWER-HALF ASCENDERS	UPPER-HALF STABLE TRACTS	LOWER-HALF STABLE TRACTS	UPPER-HALF DESCENDERS	LOWER-HALF DESCENDERS
Total population	107,621	42,291	262,306	154,458	65,192	167,040
Percentage of population	13.47%	5.29%	32.83%	19.33%	8.16%	20.91%

sprawl, and continued suburban development (Gordon 2008). All urban neighborhoods are trying to run up the down escalator. It is hard to imagine that the very large areas of high poverty in north St. Louis and East St. Louis can be improved greatly without greater regional growth. In St. Louis, large-scale neighborhood improvement is conditional on economic improvement. An active jobs agenda for the region is critical, as is a transportation agenda that connects workers in declining or stable low-income areas to jobs. The trends in St. Louis and other cities suggest that most job growth will occur in the Central Corridor, near universities, existing high technology job clusters, and walkable dense neighborhoods. In order to ensure access to these jobs for many residents, a transportation agenda is necessary.

While much of the St. Louis agenda must be regional and economic there are steps that should and must be taken at the neighborhood and sector level. Particularly worthy of attention are policies ensuring that affordability is maintained in rebounding neighborhoods, as well as strategies for alleviating concentrated poverty. Implementing these steps will, in all cases, require a detailed analysis of local market conditions, population trends, and local capacity. There is no one-size-fits-all community development proposal.

Policies for Rebound Neighborhoods

Rebounding neighborhoods provide an opportunity for sustained integration along lines of race, ethnicity, and social class. Analysis suggests that this has been substantially achieved to this point, but the future remains uncertain and steps should be taken now could ensure long-term economic and racial diversity, including the following recommended policy options.

First, affordable housing in rebound neighborhoods can be guaranteed by targeting housing subsidies. State and federal LIHTCs, often layered with other subsidies, provide the most common means of financing low-income rental housing. Current LIHTC policy increases depth of subsidy for development proposals in "qualified census tracts," often defined as those tracts with poverty rates of 25 percent or more. Looking specifically at LIHTC units built in the study area of this paper from 1998 to 2013, the good news is that more units were allocated to rebound tracts (27 percent of all LIHTC units) than any other neighborhood type. However, a majority of LIHTC units (60 percent) were located in neighborhoods in the bottom half on the Rebound Index in 2010. Policymakers should revise LIHTC allocation rules to increase the use of the tax credit in rebounding neighborhoods and other

high opportunity areas.[21]

Second, increasing the use of community land trusts, in which a nonprofit community organization retains ownership of the underlying land but sells the housing structure to a low- to moderate-income buyer, is recommended. Profits from subsequent sale of the home are then capped, so that the home remains affordable for the next owner. Community land trusts offer an opportunity to control housing inflation, but governments differ with regard to how they assess the value of the home for taxation purposes. State and local policymakers should consider property tax assessment policies that take into account the community land trust arrangement to prevent the displacement of eligible homeowners due to rising property taxes (Bagdol 2013). Nonprofit-owned housing is another way to help low-income and minority households stay in rebounding neighborhoods.

Third, in addition to creating new housing opportunities, housing and tax policy should be harnessed to prevent the displacement of existing low- and moderate-income households. Some states provide a "circuit breaker" program, allowing for a tax rebate based on households' housing costs. Missouri's circuit breaker is currently available only to low-income senior citizens and individuals with a disability. This program could be extended to cover other low-income renters, as well. Property tax abatement could also be expanded. St. Louis City currently offers tax abatement for new homebuyers, but this benefit could be extended to existing low-income homeowners.

Finally, the City of St. Louis and other municipalities should carefully evaluate requirements for inclusionary zoning. As markets strengthen in St. Louis it should be possible to enact policies that require developers to build 20 percent affordable housing units in any development of substantial size.

Policies for Declining and Distressed Neighborhoods

The great policy challenge of St. Louis is how to reduce concentrated poverty. As figure 2 makes clear, St. Louis has very large areas of the region north of the Central Corridor that are marked by both high poverty rates and economic decline. The loss of industrial jobs, structural and institutional racism, and the lack of anchor institutions combine to create a daunting challenge. The strategy of rebound in the Central Corridor, while impressive, is unlikely to be successful in north St. Louis City or County. The north region

21 Similarly, Section 8 housing vouchers often end up in areas of high poverty (Metzger 2014a). Reforms are needed to insure that holders of Section 8 vouchers have opportunities to enter high-opportunity neighborhoods. Recommendations on reforming Section 8 can be found in Metzger (2014b). Reforms to LIHTC and Section 8 were recently included as calls to action by the Ferguson Commission (see "Forward through Ferguson: A Path Toward Racial Equality," **http://forwardthroughferguson.org**).

lacks the growing job centers, dense walkable communities, and amenities of the Central Corridor. The strategy will need to be different and it will need to be sufficient in scale to turn the market around. The interventions require collaboration across sectors—public, private, and nonprofit—and across levels of government, simultaneously addressing jobs, crime, health, education, and other needs (Turner et al. 2014). These interventions require resource commitments far beyond those now commonly provided.

The Obama administration's Promise and Choice Neighborhoods programs are examples of comprehensive community revitalization initiatives (White House 2011), but they are not funded at anywhere near the level that would be needed to have a chance to turn around the degree and extent of poverty in north St. Louis. The fragmentation of local government in Missouri (90 municipalities in St. Louis County alone) makes effective local action difficult. Ultimately, at least in part, this is a political question: Can we summon the resources needed to solve deep poverty and contribute to national prosperity? Support need not be all financial. A concerted regional and governmental effort to place regional amenities in north St. Louis City and County would be very helpful, but it must be substantial and long-term. Particular attention should be focused in four areas.

First, it is necessary to affirmatively locate regional amenities in areas of historic neglect. There is no disagreement among local analysts in St. Louis about the way the two great parks of the City of St. Louis have driven neighborhood development. Could not a great regional park be placed in north St. Louis, something that would draw people from throughout the region and provide particular value for local residents? North St. Louis is poor and it is primarily African American. Middle class residents who moved to north St. Louis or the northern suburbs and bought property 30 years ago received vastly lower returns on their investments than those who moved to the western or southern suburbs. It is time for an affirmative program of building market demand.

Second, policies are needed to link declining neighborhoods to rebounding neighborhoods. These policies would aim to spread the market strength and housing demand of rebound neighborhoods to adjoining, weaker market areas. One policy tool that could be used this way is tax increment financing (TIF). Though TIF in Missouri is legally targeted on "blighted areas," the courts have allowed such a loose definition of blight that TIFs are located throughout the St. Louis region, even in the strongest market communities (Coffin 2013). On the other hand, TIFs often do not offer enough incentive by themselves to entice developers into declining neighborhoods. TIF districts, however, could be extended from rebound neighborhoods to weak market areas along retail corridors and public transit lines, using the TIF bond

proceeds to build infrastructure to jump start investment in weak market areas. This would help St. Louis spread the strength of the Central Corridor north and south into disadvantaged minority communities.

Third, in order to conduct the complex, multi-sector work described previously, there is a need for a consistent entity that serves as a convener. This backbone to collective impact efforts could increase cooperation across entities and provide for more strategic planning across fragmented governmental and non-governmental entities. Currently a number of entities serve in this sort of a capacity in the St. Louis region, but it is not clear whether they will be viable in the long term and whether they can promote changes to existing community development practice as fundamental as those described previously.

Finally, as previously noted, the problem in St. Louis is not so much inflated housing costs as inadequate incomes. A critical part of the solution is decent paying jobs. Locating affordable housing in rebound neighborhoods with an expanding job base does not guarantee that low-income and minority residents will get those jobs. A recent study of 10 older industrial cities concluded: "The city's job base is increasingly becoming concentrated in the central core, while those jobs are increasingly held by commuters rather than city residents" (Mallach 2015, 464). Targeted job training and placement programs, leading to living wage jobs, should be a high priority across the region. ■

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Patterns of Housing Voucher Use Revisited: Segregation and Section 8 in 2013

MOLLY W. METZGER
Washington University in St. Louis

DANILO PELLETIERE
District of Columbia Department of Housing and Community Development

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Since the 1990s, there has been significant academic and policy interest in the "geography of opportunity" (Briggs 2005) and how federal housing assistance connects low-income households to place-based opportunity. Empirical research has shown that where individuals reside—particularly where children are born and grow up—is closely correlated with their future health, education, and employment outcomes (Chetty et al. 2014). Better health, educational attainment, and income are all associated with residing in lower poverty, higher opportunity neighborhoods.

As a result, there has been considerable research into the U.S. Department of Housing and Urban Development (HUD) programs, particularly regarding the location and neighborhood characteristics of HUD-assisted households. Also known as the Housing Choice Voucher (HCV) program, HUD's Section 8 voucher program has received attention specifically because it was designed to integrate assisted households into the private market. Although some research has found that voucher households are fairly widely dispersed (Devine et al. 2003) and located closer to high performing schools than traditional public housing residents or those in poverty more generally (Horn, Ellen, and Schwartz 2014), voucher households remain highly concentrated in poorer neighborhoods (McClure, Schwartz, and Taghavi 2014) and further from high performing schools (Horn, Ellen, and Schwartz 2014) relative to more general segments of the population. Talen and Koschinsky (2014) found that HUD-assisted households, including voucher holders, reside in neighborhoods with poor access to services and amenities. Moreover, longitudinal analyses provide little or no evidence of improvement over the last decade, with voucher households consistently concentrated in high-poverty and minority population neighborhoods (McClure, Schwartz, and Taghavi 2014; Metzger 2014a).

By focusing on comparisons to other housing assistance programs and broad population categories (e.g., all households, all renters, or all households in poverty), this literature stops short of explaining the extent to which the HCV program itself actually contributes to segregation and the concentration of poverty. Because the voucher household population has fairly distinct characteristics from all these groups, even from other housing programs, it is difficult to say whether the observed segregation of voucher holders is driven by the program or by more general features of housing markets or—more broadly—the economy and society.

To provide greater insight into the voucher program's association with racial and economic segregation, this paper builds on the analysis of Metzger (2014a) by using the Comprehensive Housing Affordability Strategy (CHAS) data from 2007–2011 and a special tabulation of the Picture of Subsidized Housing (PoSH) data from 2013. These data allow us to more clearly define comparison groups and provide a more complete geographic picture of the distribution and characteristics of voucher households.

Previous Research on Voucher Household Locations

There have been a number of recent more general reviews of the research on the location of vouchers (Metzger 2014a; Sard and Rice 2014). In this paper, we focus on recent studies (table 1) similar to the current research in their

Table 1. Recent analyses of the segregation and opportunities of voucher holders

	VARIABLE OF INTEREST/ DEPENDENT VARIABLE	COMPARISON GROUP(S)	HOUSING MARKET AND POLICY VARIABLES	OTHER NEIGHBORHOOD CHARACTERISTICS
This paper	Income and race segregation indexes	ELI renters (HUD income limits) by racial/ethnic minority status	SOI legislation	Household income and minority share
McClure and Johnson (2015)	Assisted housing and welfare recipients as a share of the housing stock	Other assisted housing, households on welfare, rental units	None	Race, ethnicity, unemployment, and poverty tract shares, central city/suburbs, median rents
Metzger (2014a)	Income and race segregation indexes	ELI households (approximated as <$15,000)	SOI legislation	Household income and minority share
Horn, Ellen, and Schwartz (2014)	Proficiency rate and other characteristics of nearby schools	Households with children in poverty, renters, other HUD subsidized households	Occupied housing units with rents below FMR , mean rent, vacancy	None
McClure, Schwartz, Taghavi (2014)	Voucher share of occupied housing and of housing with rents below the FMR	All households	None	Race, ethnicity, and poverty tract shares, central city/suburbs
Talen and Koschinsky (2014)	Walk score	Other HUD subsidized households	% vacant, market strength score, land use diversity, gross density	Minority share, crime, school performance, brownfields

methods, use of data, and their definition of comparison groups. The variables of interest in these papers vary, but all five papers in table 1, including the current research, are broadly interested in the quality of the neighborhoods in which voucher holders live. Horn, Ellen, and Schwartz (2014) are interested in access to better schools. Talen and Koschinsky (2014) look at access to services and amenities, comparing block groups with high walk scores to those with low walk scores by the proportions of subsidized households and across a range of neighborhood quality variables. McClure and colleagues examine the distribution of vouchers across census tracts of various characteristics (McClure, Schwartz, and Taghavi 2014; McClure and Johnson 2015).

Despite the variation in the variables of interest, we might expect the variables used to establish comparison groups to be similar. As table 1 indicates, here too can be seen considerable variation. Horn, Ellen, and Schwartz (2014), Talen and Koschinsky (2014), and McClure and Johnson (2015) provide comparisons across subsidized housing programs. Because these programs might be considered different approaches to serve similar (or in some cases the same)[1] households, this approach provides insight into the relative effectiveness of different programs in assisting beneficiaries moving to higher quality neighborhoods, however defined. This approach does not address, however, whether voucher households fare better as a result of receiving voucher assistance.[2]

McClure and Johnson (2015) also compare households with housing assistance to those receiving Temporary Assistance for Needy Families (TANF). In many ways this population is similarly needy as households in the HCV and other housing programs. But they are also likely to be different from housing assisted households in important ways. In general, states must use TANF funds

1 It is important to note that Low-Income Housing Tax Credit (LIHTC) can be combined with many of the HUD programs (the HUD programs cannot be combined with each other). Thus, there is likely double counting in these. It is difficult to provide an authoritative estimate of the extent of the overlap, but for a rough sense of the magnitude of this overlap, our tabulations of the Rental Housing Finance Survey suggest that 87 percent of LIHTC *projects* benefit from at least one Housing Choice Voucher, and a recent report from HUD of available administrative data finds that at least 36 percent of LIHTC units are assisted by monthly housing assistance, primarily HCVs (Hollar 2014).

2 It is important to remember that housing assistance receipt is not an entitlement and recipients are selected in a variety of ways from a much larger eligible population. Roughly one in four eligible households receives HUD's rental assistance. The Moving to Opportunity (MTO) program created a controlled experiment to address a related question about the effect of location on assisted households in five cities that has provided a trove of research. However, the MTO experiment is not directly relevant here. First, it primarily used the voucher program to test a hypothesis rather than being a test of the voucher program itself. Second, in the MTO experiment, the control group was in public housing, not unassisted. Third, the intervention directed the treatment group of interest to specific low-poverty neighborhoods.

to serve families *with children* and a significant proportion of those receiving cash assistance are in owner-occupied housing.[3] The housing assistance programs examined in this paper serve a full range of households from individuals to childless couples and families and they are almost entirely renters. Also, eligibility criteria and in particular the level of income for someone receiving cash assistance can vary from state to state, as can benefit levels and work-related activities required of applicants. HUD programs provide less such leeway and the variation is rarely at the state level. A final complication is that roughly 11 percent of households receiving HCVs also receive TANF assistance (U.S. Department of Housing and Urban Development 2015a).

While comparing voucher assisted households to unassisted eligible households is perhaps the ideal, little easily accessible data exist to identify this population. Therefore, another approach is to compare the voucher assisted households to a more general population of which they are part. Horn, Ellen, and Schwartz (2014), McClure, Schwartz, and Taghavi (2014), and McClure and Johnson (2015) take this approach. McClure, Schwartz, and Taghavi make an implicit comparison of voucher holders to the distribution of all households. Horn, Ellen, and Schwartz (2014) compare the location of assisted households to that of households in all rental units—as do McClure and Johnson (2015)—and units renting below HUD's Fair Market Rent (FMR), the local rent limit used in administering the voucher program. Horn, Ellen, and Schwartz also use poor households as a reference sample.

The difficulty with these comparisons is that the characteristics of renters who use a voucher differ from all households, all renters, and even all those who rent modest homes (i.e., below FMR). For example, they are by definition lower income and also more likely to be minorities in urban areas. Similarly, many voucher users are poor, but the typical voucher household in a specific metropolitan statistical area (MSA) may have an income above the national poverty level. This is because the poverty rate is set nationwide and voucher program income limits vary with the local income levels.[4] Moreover, not all those in poverty are renters (e.g., retirees who occupy a home they own free and clear).[5]

These recent analyses provide useful insight into two related questions: (1) are voucher households located in similar neighborhoods with similar access to opportunity compared to the general population; and (2) are voucher holders

3 According to the Current Population Survey's Annual Social and Economic Supplement in 2014, 23 percent of children in TANF households live in owner-occupied housing (U.S. Census Bureau 2014).

4 Horn, Ellen, and Schwartz (2014) find that 72.6 percent of voucher holders nationwide are poor. As a side note, starting with the 2014 income limits, the extremely low-income (ELI) threshold is set at the poverty level or the traditional ELI threshold, whichever is greater.

5 Also, even many who are renters are unlikely to apply for or benefit from a voucher (e.g., college students).

located in neighborhoods with similar access to opportunity as recipients of other assistance programs? The answer to the former question is generally no; the latter is more mixed, but the consensus is that voucher holders fare better than those in most place-based housing assistance programs serving a similarly low-income population (Horn, Ellen, and Schwartz 2014; McClure, Schwartz, and Taghavi 2014; Talen and Koschinsky 2014). McClure and Johnson (2015) find voucher holders fare worse than those receiving TANF but better than in other HUD housing programs in the measures of neighborhood quality.

The limitations of the control groups make the literature less qualified to determine whether the voucher program itself contributes to, works against, or is simply a nonfactor in racial and economic segregation among the population likely to be eligible and apply for a voucher. To assess the performance of the voucher program in addressing segregation for the specific population it was meant to assist, Metzger (2014a) defined her comparison group empirically using program data to better approximate the voucher population. Rather than using poverty, she selected an income cutoff ($15,000 annually) based on the distribution of voucher household income nationally. Sensitivity analyses included comparison groups with annual income cutoffs of $10,000 and $25,000. The results suggested that voucher holders were not only more economically and racially segregated than the general population but also those with similar incomes. On a more positive note, Metzger also found that local "source of income" (SOI) protection laws appeared to mitigate this result.

Given the limitations of the publicly available American Community Survey (ACS) data at the tract level, the comparison in Metzger (2014a) was to all households below the $15,000 income limit and not cross-tabulated with any other characteristics known to describe the voucher population. In particular, tenure and minority status, which are well known to determine housing market opportunities for assisted and unassisted households alike, could not be accounted for. This paper improves on the previous analysis by further specifying the comparison group.

Data and Methods

Data Sources

Following Metzger (2014a), this study is a tract-level analysis of the same 50 MSAs, the most populous in 2000. Data on the location and characteristics of voucher households come from a special tabulation of the 2013 Picture of Subsidized Households (PoSH) data obtained from HUD through a data license request. In the public PoSH dataset, the characteristics of voucher

Table 2. Characteristics of HCV households in the 50 sample metropolitan areas

	MINIMUM ACROSS MSAs	MAXIMUM ACROSS MSAs	MEAN ACROSS MSAs	SD ACROSS MSAs
VLI	91.1%	98.4%	96.1%	1.5%
ELI	64.3%	86.1%	76.9%	4.5%
Minority	33.9%	99.8%	76.1%	14.3%
Black	0.2%	93.7%	57.8%	23.9%
Native American	0.0%	3.7%	0.6%	0.8%
Asian	0.0%	36.1%	2.7%	5.9%
Hispanic	0.7%	99.6%	14.9%	18.9%
VLI and Minority	33.0%	93.2%	72.8%	13.3%
ELI and Minority	27.6%	76.8%	58.2%	10.7%
Total HCVs	5,122	206,828	25,437	31,410

Note: ELI = Extremely low income, HCV = Housing choice voucher, MSA = Metropolitan statistical area, SD = Standard deviation, VLI = Very low income.

holders are suppressed for census tracts with between 1 and 10 voucher holders. In this data, the values for a selection of characteristics[6] are not suppressed in these low-voucher tracts. The removal of suppression improves the geographic comparability of the PoSH data to the ACS data at the tract level.

The data used here also include the percentage of voucher households that are both minority and extremely low-income (ELI) according to HUD income limits, a variable not included in the public PoSH data. According to the Quality Housing and Work Responsibility Act of 1998 (QHWRA),[7] 75 percent of vouchers must serve ELI households (Devine et al. 2000); in our data 77 percent of voucher holders fall into this income category (table 2).

The data for the comparison groups come primarily from the 2007–11 Comprehensive Housing Affordability Strategy (CHAS) data. CHAS data are ACS data tabulated by the Census Bureau for HUD using income limits and other categories relevant to HUD programs. These data provide the same ELI cutoffs for the general population used in the PoSH data to describe the HUD-assisted population.

6 These characteristics include the percentage of voucher households that have household incomes below HUD's very low-income threshold, the percentage below the extremely low-income threshold, and the percentage minority.

7 Title V of Pub.L. No. 105–276, 112 Stat. 2518, approved October 21, 1998.

Data from the ACS (2007–11) is used to create an additional comparison group: households that earn less than $15,000 annually. These data are used to update the analyses in Metzger (2014a). Tract-level income and race and ethnicity data from the ACS is also used to calculate the segregation indexes, described in detail below.

Defining the Comparison Groups

The three data sources used for this paper allow calculation of residential patterns for two voucher groups, all voucher households and minority voucher households, and four comparison groups:

1. households that earn less than $15,000 annually (ACS),
2. ELI renters (CHAS),
3. cost-burdened ELI renters (CHAS), and
4. minority ELI renters (CHAS).

Households with less than $15,000 in annual income are used to establish continuity with previous research. The comparison groups of interest are the various ELI renter categories. These should better approximate the voucher-eligible population by using the program's local income limits and focusing on renters. The voucher program is a rental program that primarily serves households that are renters when they enter the program. More importantly perhaps, rental housing, particularly the modest rental housing that serves voucher holders, is itself highly concentrated in a relatively few neighborhoods in many metropolitan areas.

This paper examines the ELI renter population with unaffordable housing-cost burdens, which sharpens the focus on voucher-eligible households likely to be in need of assistance. Households are considered to have an unaffordable housing-cost burden if they spend more than 30 percent of their income on housing-related costs. Extremely low-income renters without cost burdens already have low rents, in some cases because they already receive housing assistance. Households with a cost burden should be more motivated to apply for and benefit from voucher assistance.[8]

This paper also specifically compares minority voucher holders to minority ELI households. It is well established that minority renters face discrimination

8 While households with assistance can be expected to have lower cost burdens than they would without assistance, depending on the measures of income and rent used many of these households do fall above the 30 percent income threshold used in federal programs. The percentage paying more than 30 percent of income is estimated at above 40 percent in the Housing Choice Voucher program (Leopold et al. 2015).

in the rental market, independent of their status as voucher holders (Roscigno, Karafin, and Tester 2009). This comparison controls for minority status and provides insight into the role of vouchers in serving minority households specifically.

A final set of analyses examines differences in voucher location patterns between MSAs with SOI fair housing protections and those without such local legislation. The Poverty and Race Research Action Council (2015) provided the inventory of SOI laws.

Segregation Indexes

Using these merged datasets, this paper consider the segregation of voucher households by income and by race/ethnicity. Neighborhood income patterns are measured using two indexes: the Herfindahl index and the dissimilarity index.

To compute the economic Herfindahl index, census tracts within each MSA are divided into deciles by tract median income. The Herfindahl index scores indicate the extent to which voucher households are evenly distributed across these income deciles. Metzger (2014a) provides a more complete description of the calculation of this index. Calculated across income deciles, the Herfindahl index could take a values ranging from 0.1 (the most dispersed voucher population) to 1 (the most concentrated voucher population).

The economic dissimilarity index scores are calculated to measure the extent to which voucher households and middle- and upper-income households reside in the same census tracts (Massey and Denton 1988). For the purpose of the income dissimilarity index, middle- and upper-income households are defined as those that earn $50,000 or more annually. A higher dissimilarity index suggests greater segregation between HCV households and middle- and upper-income households, interpreted as the percentage of households from one group who would have to relocate to be evenly dispersed among households from the other group.

For racial concentration, the Herfindahl index is employed, tracts in each MSA are divided into deciles by the percentage of the tract population that self-reported as non-Hispanic and white, and the Herfindahl index is computed using these deciles. Similarly, the racial dissimilarity index reflects the overlap of voucher households and non-Hispanic, white residents.

The differences in the respective segregation indexes between groups is calculated using the nonparametric Kolmogorov-Smirnov equality-of-distributions test (Lilliefors 1967) because of the non-normal distribution of segregation indexes across MSAs.

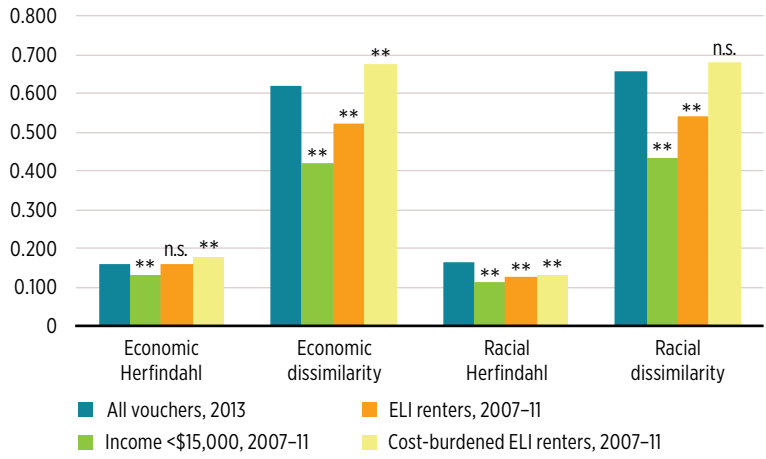
Results

Figures 1 and 2 present the results for each of the four segregation measures for voucher holders and the four comparison groups. The full set of results reflected in these figures, as well as specific MSA by MSA results, are provided in appendix tables 1–8.

Figure 1 shows results for all renters in each group, regardless of race/ethnicity. Replicating previous findings (Metzger 2014a), voucher holders are more segregated than households earning less than $15,000 across all measures of racial and economic segregation (p<.001). This pattern of greater segregation among HCV households remains holds true compared to ELI renters for three of the four measures: economic dissimilarity, racial concentration, and racial dissimilarity (p<.001). However, the patterns change significantly when compared to the cost-burdened ELI renter group. HCVs renters are less economically segregated than this comparison group as measured by both measures of economic segregation (p<.001). They are more segregated in terms of racial concentration (p<.001), but there is no significant difference in terms of the racial dissimilarity index.

The minority voucher holder comparisons provide further insight into this pattern of findings. Figure 2 shows that minority voucher holders are little

Figure 1. Summary of findings for all households



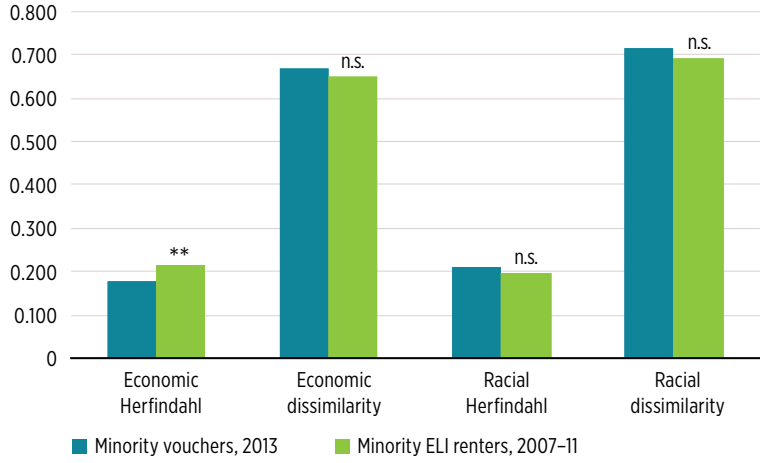
Note: ELI = Extremely low income

n.s. p ≥ .01 compared to voucher holders

* p < .01 compared to voucher holders

** p < .001 compared to voucher holders

Figure 2. Summary of findings for minority households



Note: ELI = Extremely low income

n.s.	p ≥ .01 compared to minority voucher holders
*	p < .01 compared to minority voucher holders
**	p < .001 compared to minority voucher holders

differentiated from other minority ELI households. Minority vouchers are slightly less segregated in terms of the economic concentration index (p<.001), but there is no statistically significant difference in the other three measures of segregation.

An additional set of models examined whether differences between voucher households and the respective comparison group differed between MSAs with SOI protections and those without. Metzger (2014a) provides a description of the statistical methods used. Contrary to Metzger's results using data from 2008, these difference-in-difference models provided few statistically significant results. Overall, voucher households appeared more dispersed than the respective comparison groups in regions with SOI protections, but only in comparison to households earning less than $15,000 annually did these differences near the statistical significance threshold of 1 percent used here (p = .11 for economic dissimilarity, p = .13 for racial concentration, p = .13 for racial dissimilarity).

Discussion

In this research and in Metzger (2014a), on average across all 50 MSAs, voucher holders are more concentrated economically and reside in greater-share minority neighborhoods than all households that earn less than $15,000

annually. This confirmation of Metzger's earlier results gives us confidence that differences in the data alone are not likely to be driving the mixed results using the improved comparison groups.

Compared to all ELI renter households, the program appears to have little impact, positive or negative, on deconcentrating voucher households away from lower income neighborhoods, according to the economic Herfindahl index. However, voucher holders do appear to live in higher income neighborhoods when compared to the cost-burdened ELI renters (i.e., those likely to need assistance). A similar pattern is revealed for economic dissimilarity. Voucher holders are less likely to live with middle- and higher-income households than ELI renters generally, but they are more likely to do so than those ELI renters that are housing-cost burdened. These findings may indicate that voucher holders fare better than those in need of assistance in reaching higher income neighborhoods and living closer to middle- and higher-income households.

On average, minority voucher holders and minority ELI households are concentrated in relatively few neighborhoods and rarely live in the same neighborhoods as non-low-income households within their MSA. In particular, having a voucher appears to have little impact on minority households when it comes to moving away from racially and ethnically segregated communities. There is evidence, however, that minority voucher households do move away from lower income communities. The implication is that the relatively higher-income neighborhoods minority households reach using their voucher still have relatively high percentages of minority residents as well.

The rent limits applied in the HCV program (Fair Market Rents), generally limit households to homes offered for rent at or below the median rent in the metropolitan area and there is no federal requirement that landlords renting units otherwise eligible for the program accept voucher holders on an equal basis to cash renters.[9] In the absence of any other local effort or program mechanism to facilitate integrating these households, it is perhaps not surprising that voucher households on average find their way into only slightly higher income neighborhoods (those with modestly higher rents) but are less likely to settle in neighborhoods with lower shares of minority households than similar households generally.

When the individual MSA results are scrutinized (appendix tables 5–8), it becomes clear that the MSA a voucher holder lives in matters. Some broader geographic patterns are also discernible by region of the United States. For example, HCV programs in Southeastern MSAs tend to perform

9 Accepting a voucher holder as a tenant comes with additional paperwork and responsibilities for the landlord relative to renting to a cash renter. So even in the absence of other biases, all else being equal, voucher holders may be at a disadvantage in the rental market.

the worst with regard to patterns of segregation. Voucher holders in Atlanta and Birmingham are consistently among the most segregated across multiple measures of segregation and multiple comparison groups. In Birmingham, the racial concentration (Herfindahl index) was .218 for voucher holders and .121 for cost-burdened ELI renters. In Atlanta, the racial concentration (Herfindahl index) was .250 for minority voucher holders and .160 for minority ELI renters. The best performing HCV programs, by the measures used here, tended to be clustered in the Southwest and in California. Phoenix's economic dissimilarity index, for example, is .604 for minority voucher holders and .659 for minority ELI renters.

That minority HCV holders are more segregated than minority ELI renter households in the Southeast is an interesting result that deserves further study. It is not immediately obvious why voucher holders appear to be *more disadvantaged* in these areas. It might be expected that these MSAs, with well-established and historically determined racial divisions, would offer fewer residential locations for lower income minorities in general, but this would not be expected to put voucher holders at a specific disadvantage.

The apparent greater integration of voucher holders in the Southwest is also interesting. Perhaps the relatively recent, rapid development of the MSAs in the region in the post-civil rights era has not led to firmly established patterns of segregation. It may also be simply an artifact of data limitations: a general designation for "minority" does not differentiate white Hispanics and others from the predominantly African American population of the Southeast.

There are other interesting results in these data to be investigated. At first, Baltimore, Maryland, stands out for being relatively well integrated according to the indexes, when the city is known for its concentration of poverty and troubled housing programs. However, advocacy and a court case against the Housing Authority and HUD, the so-called Thompson case, have resulted in a number of mobility interventions in the city and surrounding area that are now being lauded for moving HCV families to higher income and less racially concentrated neighborhoods throughout the region (Darrah and DeLuca 2014). There have been other prominent modifications of the voucher program meant to explicitly achieve mobility goals that resulted from court cases and policy experiments such as the Gautreaux decision in Chicago and the Moving to Opportunity (MTO) experiment in five cities (including Baltimore and Chicago along with Boston, Los Angeles, and New York). These have all been limited in both local scale and geographic application and prove more of the exception than the rule, with McClure (2010) concluding that under standard program rent rules there are too few units of voucher-accessible housing in high opportunity neighborhoods.

Finally, the comparison of MSAs with and without SOI protections produced fewer significant results than in previous research. However, it is important to note that the sample of MSAs was updated from the previous analysis of vouchers in 2008 (Metzger 2014a) to include those MSAs that passed SOI protections in the interim years. It is possible that the more recently added legislation was too new to exert any significant influence on voucher outcomes. Moreover, an MSA was considered an "SOI" MSA even if only one municipality in that MSA included SOI protections. Future research should examine the distribution of vouchers within the specific municipalities containing SOI protections, rather than relying solely on the coarser MSA-level patterns.

What explains the persistent racial concentration and segregation experienced by voucher program participants? On their own, these indexes cannot show whether program design or local policy, landlord or tenant biases—or likely a combination of factors—explain the outcomes. The concentration of voucher recipients in low-income neighborhoods appears more obviously tied to the program's rent rules and the local context in which it is operating. A variety of policy solutions could be implemented in order to address economic concentration (Sard and Rice 2014). Several of these solutions are discussed below. With a program more clearly designed and implemented to foster integration, the fair housing limitations could be better assessed and addressed.

Source of Income Protections

Metzger (2014a) found that source of income protections had a significant effect in mitigating the concentration of voucher households. In this research, the effect was not statistically significant, but the direction was similarly negative suggesting this policy should remain under consideration at the local level. HCVs should be explicitly listed as a source of income protected from housing discrimination.

Eliminate Special Occupancy Permits

HUD has specific housing quality standards that buildings rented to Section 8 participants must meet. In some municipalities, Section 8 inspections are required above and beyond standard requirements. The stated purpose of these inspections is to ensure that Section 8 housing maintains a high quality, but ultimately, they may discourage landlords from participating in the Section 8 program because of the added time and cost required (Metzger 2014b). St. Louis required special Section 8 inspections until recently,

when the city council repealed them. St. Louis could serve as an example to other municipalities in removing any redundant occupancy permits or inspection requirements.

Tax Incentives

Tax incentives are an important tool that local and state governments can use to encourage landlords from low-poverty areas to rent to voucher recipients. For example, Illinois offers a property tax abatement available to landlords who rent to voucher recipients in low-poverty areas (Sard and Rice 2014). The tax incentive is available to landlords in areas with high property values and poverty rates under 10 percent, and public housing authorities are responsible for the administration of the program. State and local governments can also use tax incentives to encourage building low-income housing in low-poverty areas. As federally funded projects, LIHTC projects are compelled to accept voucher holders. Applicants for LIHTCs could receive points on their application, a process administered at the state and local level, for building in low-poverty areas. These financial incentives would encourage the establishment of housing options for voucher recipients in low-income areas of municipalities.[10]

Housing Mobility Programs

While local and state governments have a great deal of power to increase the housing options of voucher recipients, they can increase their options even more by partnering with the federal government. This and the recommendations listed below would be carried out by state and local governments in collaboration with the federal government.

Local municipalities could establish additional housing mobility programs in partnership with HUD to support families who want to make "opportunity moves" to low-poverty neighborhoods (Scott et al. 2013). Housing mobility programs involve identifying landlords in low-poverty neighborhoods that would be open to renting to voucher recipients and extending outreach to those landlords to encourage them to participate in the program. Housing mobility programs also work with voucher recipients by providing mobility counseling, providing extended time for housing searches, and

10 The federal government has proposed a step in this direction, by specifying small area Difficult to Development Areas for the LIHTC program that would encourage LIHTC developments in higher rent areas within high-cost metropolitan areas. The current policy designates high-cost metro areas but does not specify high-rent areas more locally within those areas (U.S. Department of Housing and Urban Development 2014).

offering assistance with moving costs and deposits. These programs ultimately benefit the voucher recipients, landlords, and the community.

Small-Area Fair Market Rents

As indicated in the discussion previously, FMRs dictate where voucher recipients can live by establishing the maximum amount of rent that the Section 8 program will cover. Currently, HUD generally sets one FMR for an entire metropolitan area at or below the median rent for a standard quality rental home. This calculation results in many low-poverty neighborhoods not having any Section 8 properties because the rent in those neighborhoods is too high. It may also allow landlords in high poverty neighborhoods to seek higher rents that are above the local market level but still below the FMR. One solution for this is small-area FMRs, where FMRs would be set for smaller areas within a metropolitan region, such as zip codes, instead of the region as a whole. HUD is already piloting this program in a small number of regions (U.S. Department of Housing and Urban Development 2015b). Small-area FMRs should be implemented across the country to increase the number of neighborhoods with Section 8 eligible rental homes and the number of eligible homes within low-poverty and majority white neighborhoods.

Portability of Vouchers

Public housing authorities are responsible for administering vouchers. There are frequently several different housing authorities in a region, each administering their own voucher programs. In many municipalities, it is very difficult to transfer, or "port," a voucher issued by one housing authority within the jurisdiction of another housing authority. Local governments should work with HUD to make vouchers more portable across housing authorities to maximize a voucher recipient's housing choice across the region.

Assessment of Fair Housing

HUD recently finalized a new Affirmatively Furthering Fair Housing rule for recipients of various forms of HUD funding (U.S. Department of Housing and Urban Development 2015c).[11] HUD already required these grant recipients to comply with the Fair Housing Act,[12] but the new rule requires them to

11 Affirmatively Furthering Fair Housing, 80 Fed. Reg. 42,271 (July 16, 2015), **www.gpo.gov/fdsys/pkg/FR-2015-07-16/pdf/2015-17032.pdf**.

12 Fair Housing Act, Pub. L. No. 90–284, title VIII (1968), codified at 42 USC 3601–19.

complete an Assessment of Fair Housing (AFH) in order to better evaluate how well they are serving the needs of voucher recipients in protected classes. HUD will use the AFH to provide recommendations to Public Housing Agencies to improve fair housing compliance. Strong enforcement of the Affirmatively Furthering Fair Housing rule could continue to improve the Section 8 program.

Conclusion

These results suggest that though HCV program does not live up to all goals set out for it by policymakers, researchers and advocates interested in encouraging geographic mobility and economic, ethnic, and racial integration, the voucher program is not a failed policy. Not only does it provide a roof over the heads of more than 2 million households, it does a modest job of enabling households, particularly those that are extremely low income and cost burdened or of a minority racial or ethnic group, to move to higher income neighborhoods. The discourse surrounding the program has focused significantly on the issue of housing mobility, fueled by researchers' examinations of the Gautreaux program and the MTO experiment. However, mobility interventions such as these have not been replicated in the HCV program at scale. Ordinary voucher holders do not receive the intensive housing counseling or increased subsidy levels that went into programs like Gautreaux and MTO. As such, it is not surprising that the HCV program does not appear to be a vehicle for widespread integration and dispersal of assisted households; it was simply not designed to serve this purpose. While these results provide a reason for some optimism about the current program's capacity to improve neighborhood circumstances for voucher eligible households, changes to the program and the local policy context are indicated to enhance its capacity to provide greater mobility, effectiveness and efficiency. ■

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Appendix Table 1. Income Herfindahl index: Results across 50 metropolitan areas

	MIN	MAX	MEAN	SD	N
PREVIOUS FINDINGS (METZGER 2014)					
Voucher holders, PoSH 2008	.112	.214	.149	.019	50
Households earning < $15,000, ACS 2009	.107	.156	.124	.010	50
VOUCHER HOUSEHOLDS, PoSH 2013					
All voucher holders	.111	.210	.160	.019	50
Minority voucher holders	.111	.251	.177	.030	50
COMPARISON GROUPS, ACS/CHAS 2011					
Households warning < $15,000	.106	.161	.130	.011	50
ELI renters	.114	.184	.157	.015	50
Cost-burdened ELI renters	.110	.251	.178	.031	50
Minority ELI renters	.114	.296	.214	.039	50

Note: ACS = American Community Survey, CHAS = Comprehensive Housing Affordability Study, ELI = Extremely Low Income, PoSH = Picture of Subsidized Households, SD = Standard Deviation

Appendix Table 2. Economic dissimilarity index: Results across 50 metropolitan areas

	MIN	MAX	MEAN	SD	N
PREVIOUS FINDINGS (METZGER 2014)					
Voucher holders, PoSH 2008	.459	.708	.617	.057	50
Households earning <$15,000, ACS 2009	.358	.594	.491	.052	50
VOUCHER HOUSEHOLDS, PoSH 2013					
All voucher holders	.459	.783	.617	.059	50
Minority voucher holders	.470	.783	.669	.067	50
COMPARISON GROUPS, ACS/CHAS 2011					
Households earning <$15,000	.322	.504	.418	.039	50
ELI renters	.418	.585	.520	.037	50
Cost-burdened ELI renters	.505	.794	.676	.052	50
Minority ELI renters	.474	.772	.650	.073	50

Note: ACS = American Community Survey, CHAS = Comprehensive Housing Affordability Study, ELI = Extremely Low Income, PoSH = Picture of Subsidized Households, SD = Standard Deviation

Appendix Table 3. Racial Herfindahl index: Results across 50 metropolitan areas

	MIN	MAX	MEAN	SD	N
PREVIOUS FINDINGS (METZGER 2014)					
Voucher holders, PoSH 2008	.121	.216	.157	.020	50
Households earning < $15,000, ACS 2009	.101	.137	.111	.007	50
VOUCHER HOUSEHOLDS, PoSH 2013					
All voucher holders	.116	.236	.164	.029	50
Minority voucher holders	.118	.330	.209	.051	50
COMPARISON GROUPS, ACS/CHAS 2011					
Households earning <$15,000	.101	.138	.111	.007	50
ELI renters	.103	.151	.126	.012	50
Cost-burdened ELI renters	.103	.199	.133	.022	50
Minority ELI renters	.103	.331	.195	.057	50

Note: ACS = American Community Survey, CHAS = Comprehensive Housing Affordability Study, ELI = Extremely Low Income, PoSH = Picture of Subsidized Households, SD = Standard Deviation

Appendix Table 4. Racial dissimilarity index: Results across 50 metropolitan areas

	MIN	MAX	MEAN	SD	N
VOUCHER HOUSEHOLDS, PoSH 2013					
All voucher holders	.484	.809	.654	.072	50
Minority voucher holders	.505	.822	.716	.066	50
COMPARISON GROUPS, ACS/CHAS 2011					
Households earning <$15,000	.310	.565	.433	.059	50
ELI renters	.412	.651	.541	.050	50
Cost-burdened ELI renters	.563	.775	.680	.053	50
Minority ELI renters	.546	.800	.691	.068	50

Note: ACS = American Community Survey, CHAS = Comprehensive Housing Affordability Study, ELI = Extremely Low Income, PoSH = Picture of Subsidized Households, SD = Standard Deviation

Appendix Table 5a. Economic concentration by MSA (Herfindahl indexes by tract median income)

	HCV HOUSEHOLDS, PoSH 2013		COMPARISON HOUSEHOLDS, ACS/CHAS 2011			
MSA	ALL VOUCHER HOLDERS	MINORITY VOUCHER HOLDERS	HOUSEHOLDS EARNING <$15,000	ELI RENTERS	COST-BURDENED ELI RENTERS	MINORITY ELI RENTERS
Atlanta, GA	.197	.202	.122	.148	.152	.179
Austin, TX	.151	.154	.151	.184	.157	.212
Baltimore, MD	.151	.163	.139	.167	.209	.227
Birmingham, AL	.161	.167	.124	.150	.158	.220
Boston, MA	.153	.199	.133	.158	.175	.264
Buffalo, NY	.186	.251	.132	.171	.200	.288
Charlotte, NC	.167	.170	.126	.151	.160	.193
Chicago, IL	.164	.182	.124	.148	.173	.200
Cincinnati, OH	.151	.184	.128	.156	.177	.256
Cleveland, OH	.149	.165	.127	.153	.190	.225
Columbus, OH	.155	.174	.132	.151	.146	.210
Dallas, TX	.153	.156	.135	.159	.176	.193
Denver, CO	.179	.184	.148	.180	.205	.220
Detroit, MI	.161	.176	.131	.165	.177	.239
Hartford, CT	.210	.244	.142	.181	.184	.288
Houston, TX	.141	.143	.124	.149	.147	.178
Indianapolis, IN	.160	.186	.118	.143	.133	.201
Jacksonville, FL	.152	.157	.122	.147	.209	.213
Kansas City, MO	.145	.175	.129	.146	.165	.222
Las Vegas, NV	.111	.111	.134	.171	.185	.196
Los Angeles, CA	.150	.162	.121	.145	.153	.170
Louisville, KY	.183	.244	.132	.165	.231	.278
Memphis, TN	.149	.150	.125	.148	.148	.174
Miami, FL	.160	.162	.129	.158	.188	.185
Milwaukee, WI	.148	.187	.123	.142	.142	.224

Note: ACS = American Community Survey, CHAS = Comprehensive Housing Affordability Strategy data, ELI = Extremely Low Income, MSA = Metropolitan Statistical Area, PoSH = Picture of Subsidized Households

Appendix Table 5b. Economic concentration by MSA (Herfindahl indexes by tract median income) *continued*

	HCV HOUSEHOLDS, PoSH 2013		COMPARISON HOUSEHOLDS, ACS/CHAS 2011			
MSA	ALL VOUCHER HOLDERS	MINORITY VOUCHER HOLDERS	HOUSEHOLDS EARNING <$15,000	ELI RENTERS	COST-BURDENED ELI RENTERS	MINORITY ELI RENTERS
Minneapolis, MN	.169	.196	.140	.179	.189	.296
Nashville, TN	.187	.200	.134	.169	.196	.252
New Orleans, LA	.152	.156	.109	.122	.143	.151
New York, NY	.194	.199	.150	.178	.247	.234
Oklahoma City, OK	.160	.167	.121	.141	.146	.176
Orlando, FL	.149	.150	.114	.134	.135	.153
Philadelphia, PA	.182	.221	.161	.182	.227	.280
Phoenix, AZ	.133	.130	.136	.166	.174	.205
Pittsburgh, PA	.180	.236	.117	.143	.168	.263
Portland, OR	.167	.178	.133	.160	.184	.174
Providence, RI	.155	.209	.129	.156	.162	.247
Richmond, VA	.148	.154	.136	.175	.251	.220
Riverside, CA	.134	.134	.126	.151	.151	.163
Rochester, NY	.144	.186	.122	.149	.157	.253
Sacramento, CA	.142	.156	.133	.163	.184	.197
San Antonio, TX	.171	.176	.129	.150	.185	.174
San Diego, CA	.164	.178	.118	.152	.151	.191
San Francisco, CA	.158	.176	.141	.168	.218	.209
San Jose, CA	.153	.158	.119	.149	.163	.170
San Juan, PR	.120	.120	.106	.114	.110	.114
Seattle, WA	.182	.191	.142	.169	.186	.212
St. Louis, MO	.169	.207	.126	.153	.160	.255
Tampa, FL	.148	.161	.119	.153	.214	.203
Virginia Beach, VA	.158	.162	.127	.163	.249	.212
Washington, D.C.	.190	.210	.149	.178	.188	.222

Note: ACS = American Community Survey, CHAS = Comprehensive Housing Affordability Strategy data, ELI = Extremely Low Income, MSA = Metropolitan Statistical Area, PoSH = Picture of Subsidized Households

Appendix Table 6a. Dissimilarity index by MSA (vs. households earning >$50,000/year)

	HCV HOUSEHOLDS, PoSH 2013		COMPARISON HOUSEHOLDS, ACS/CHAS 2011			
MSA	ALL VOUCHER HOLDERS, 2013	MINORITY VOUCHER HOLDERS	HOUSEHOLDS EARNING <$15,000	ELI RENTERS	COST-BURDENED ELI RENTERS	MINORITY ELI RENTERS
Atlanta, GA	.652	.663	.392	.509	.698	.596
Austin, TX	.654	.677	.451	.528	.695	.604
Baltimore, MD	.574	.612	.459	.560	.727	.683
Birmingham, AL	.703	.739	.421	.531	.665	.692
Boston, MA	.514	.657	.373	.451	.542	.675
Buffalo, NY	.642	.762	.439	.559	.689	.772
Charlotte, NC	.641	.658	.413	.513	.679	.641
Chicago, IL	.640	.688	.416	.521	.702	.647
Cincinnati, OH	.635	.755	.447	.549	.672	.760
Cleveland, OH	.642	.720	.473	.584	.723	.747
Columbus, OH	.651	.739	.474	.551	.666	.708
Dallas, TX	.644	.663	.452	.542	.721	.632
Denver, CO	.596	.623	.449	.545	.728	.635
Detroit, MI	.657	.722	.459	.583	.729	.746
Hartford, CT	.671	.717	.447	.554	.639	.742
Houston, TX	.662	.673	.441	.537	.712	.616
Indianapolis, IN	.680	.780	.452	.572	.662	.752
Jacksonville, FL	.645	.672	.377	.485	.698	.642
Kansas City, MO	.617	.715	.449	.525	.667	.700
Las Vegas, NV	.459	.470	.385	.504	.777	.578
Los Angeles, CA	.576	.619	.381	.476	.628	.561
Louisville, KY	.626	.721	.426	.540	.663	.722
Memphis, TN	.673	.677	.504	.585	.685	.663
Miami, FL	.617	.628	.403	.517	.687	.594
Milwaukee, WI	.657	.765	.467	.550	.692	.754

Note: ACS = American Community Survey, CHAS = Comprehensive Housing Affordability Strategy data, ELI = Extremely Low Income, MSA = Metropolitan Statistical Area, PoSH = Picture of Subsidized Households

Appendix Table 6b. Dissimilarity index by MSA (vs. households earning >$50,000/year) *continued*

	HCV HOUSEHOLDS, PoSH 2013		COMPARISON HOUSEHOLDS, ACS/CHAS 2011			
MSA	ALL VOUCHER HOLDERS	MINORITY VOUCHER HOLDERS	HOUSEHOLDS EARNING <$15,000	ELI RENTERS	COST-BURDENED ELI RENTERS	MINORITY ELI RENTERS
Minneapolis, MN	.589	.647	.410	.515	.655	.687
Nashville, TN	.703	.738	.430	.543	.669	.686
New Orleans, LA	.662	.680	.385	.496	.695	.615
New York, NY	.634	.676	.447	.526	.671	.643
Oklahoma City, OK	.661	.705	.428	.529	.665	.653
Orlando, FL	.617	.629	.342	.479	.723	.567
Philadelphia, PA	.666	.709	.476	.548	.707	.703
Phoenix, AZ	.581	.604	.439	.556	.764	.659
Pittsburgh, PA	.648	.783	.380	.506	.626	.743
Portland, OR	.519	.593	.356	.446	.658	.559
Providence, RI	.563	.694	.401	.503	.576	.725
Richmond, VA	.619	.642	.440	.559	.698	.649
Riverside, CA	.559	.569	.395	.506	.671	.571
Rochester, NY	.601	.707	.431	.541	.671	.765
Sacramento, CA	.525	.592	.390	.495	.684	.568
San Antonio, TX	.642	.658	.448	.540	.686	.602
San Diego, CA	.561	.613	.349	.482	.655	.571
San Francisco, CA	.524	.576	.385	.462	.621	.551
San Jose, CA	.500	.526	.322	.418	.575	.474
San Juan, PR	.783	.783	.415	.480	.505	.480
Seattle, WA	.558	.629	.374	.460	.625	.584
St. Louis, MO	.649	.741	.413	.523	.666	.723
Tampa, FL	.592	.621	.362	.515	.794	.659
Virginia Beach, VA	.594	.614	.407	.524	.728	.624
Washington, D.C.	.560	.589	.428	.500	.683	.590

Note: ACS = American Community Survey, CHAS = Comprehensive Housing Affordability Strategy data, ELI = Extremely Low Income, MSA = Metropolitan Statistical Area, PoSH = Picture of Subsidized Households

Appendix Table 7a. Racial concentration by MSA (Herfindahl indexes by percent-white)

	HCV HOUSEHOLDS, PoSH 2013		COMPARISON HOUSEHOLDS, ACS/CHAS 2011			
MSA	ALL VOUCHER HOLDERS	MINORITY VOUCHER HOLDERS	HOUSEHOLDS EARNING <$15,000	ELI RENTERS	COST-BURDENED ELI RENTERS	MINORITY ELI RENTERS
Atlanta, GA	.236	.250	.109	.123	.114	.160
Austin, TX	.222	.250	.113	.128	.112	.170
Baltimore, MD	.150	.182	.121	.141	.153	.215
Birmingham, AL	.218	.245	.112	.137	.121	.221
Boston, MA	.155	.274	.116	.133	.140	.272
Buffalo, NY	.181	.290	.118	.146	.143	.280
Charlotte, NC	.169	.188	.108	.123	.133	.175
Chicago, IL	.206	.245	.113	.129	.130	.181
Cincinnati, OH	.176	.308	.115	.133	.150	.331
Cleveland, OH	.151	.193	.113	.131	.138	.204
Columbus, OH	.159	.252	.111	.119	.118	.228
Dallas, TX	.176	.199	.112	.121	.129	.153
Denver, CO	.148	.185	.114	.125	.130	.170
Detroit, MI	.148	.194	.115	.133	.128	.225
Hartford, CT	.194	.241	.124	.147	.139	.258
Houston, TX	.164	.176	.108	.115	.120	.132
Indianapolis, IN	.173	.236	.107	.121	.128	.219
Jacksonville, FL	.214	.234	.116	.138	.167	.212
Kansas City, MO	.147	.219	.110	.121	.131	.212
Las Vegas, NV	.131	.143	.103	.109	.126	.121
Los Angeles, CA	.125	.151	.103	.109	.109	.129
Louisville, KY	.195	.300	.121	.151	.198	.301
Memphis, TN	.175	.179	.115	.128	.112	.159
Miami, FL	.161	.165	.103	.112	.113	.123
Milwaukee, WI	.169	.255	.111	.124	.119	.221

Note: ACS = American Community Survey, CHAS = Comprehensive Housing Affordability Strategy data, ELI = Extremely Low Income, MSA = Metropolitan Statistical Area, PoSH = Picture of Subsidized Households

Appendix Table 7b. Racial concentration by MSA (Herfindahl indexes by percent-white) *continued*

	HCV HOUSEHOLDS, PoSH 2013		COMPARISON HOUSEHOLDS, ACS/CHAS 2011			
MSA	ALL VOUCHER HOLDERS	MINORITY VOUCHER HOLDERS	HOUSEHOLDS EARNING <$15,000	ELI RENTERS	COST-BURDENED ELI RENTERS	MINORITY ELI RENTERS
Minneapolis, MN	.175	.228	.117	.138	.140	.263
Nashville, TN	.202	.255	.111	.135	.146	.243
New Orleans, LA	.181	.191	.105	.114	.120	.146
New York, NY	.142	.178	.117	.131	.139	.182
Oklahoma City, OK	.162	.208	.107	.120	.118	.171
Orlando, FL	.158	.167	.106	.120	.119	.152
Philadelphia, PA	.177	.232	.138	.150	.166	.255
Phoenix, AZ	.129	.144	.104	.119	.127	.143
Pittsburgh, PA	.169	.330	.107	.126	.134	.305
Portland, OR	.135	.210	.108	.117	.116	.169
Providence, RI	.132	.225	.113	.132	.130	.297
Richmond, VA	.168	.183	.120	.142	.196	.206
Riverside, CA	.117	.127	.102	.110	.107	.127
Rochester, NY	.135	.198	.112	.131	.133	.241
Sacramento, CA	.152	.216	.107	.119	.124	.150
San Antonio, TX	.128	.133	.105	.111	.114	.122
San Diego, CA	.122	.142	.103	.109	.112	.127
San Francisco, CA	.131	.149	.106	.112	.127	.132
San Jose, CA	.116	.122	.105	.111	.111	.116
San Juan, PR	.118	.118	.101	.103	.103	.103
Seattle, WA	.152	.226	.111	.122	.124	.178
St. Louis, MO	.204	.298	.114	.135	.129	.259
Tampa, FL	.182	.245	.106	.140	.168	.241
Virginia Beach, VA	.177	.187	.116	.141	.199	.192
Washington, D.C.	.177	.205	.117	.128	.137	.169

Note: ACS = American Community Survey, CHAS = Comprehensive Housing Affordability Strategy data, ELI = Extremely Low Income, MSA = Metropolitan Statistical Area, PoSH = Picture of Subsidized Households

Appendix Table 8a. Racial dissimilarity index by MSA

	HCV HOUSEHOLDS, PoSH 2013		COMPARISON HOUSEHOLDS, CHAS 2011			
MSA	ALL VOUCHERS	MINORITY VOUCHERS	HOUSEHOLDS EARNING <$15,000	ELI RENTERS	COST-BURDENED ELI RENTERS	MINORITY ELI RENTERS
Atlanta, GA	.757	.770	.456	.578	.710	.689
Austin, TX	.708	.729	.440	.525	.681	.612
Baltimore, MD	.651	.706	.514	.618	.760	.758
Birmingham, AL	.775	.822	.433	.570	.647	.758
Boston, MA	.551	.702	.399	.481	.563	.715
Buffalo, NY	.641	.771	.429	.552	.682	.784
Charlotte, NC	.680	.700	.405	.527	.669	.677
Chicago, IL	.728	.782	.500	.607	.741	.743
Cincinnati, OH	.635	.774	.417	.528	.651	.778
Cleveland, OH	.678	.763	.493	.606	.727	.787
Columbus, OH	.631	.752	.425	.502	.630	.704
Dallas, TX	.692	.719	.475	.575	.723	.678
Denver, CO	.605	.641	.446	.546	.726	.647
Detroit, MI	.691	.774	.480	.606	.739	.800
Hartford, CT	.702	.749	.471	.572	.653	.766
Houston, TX	.749	.763	.508	.605	.726	.697
Indianapolis, IN	.674	.792	.424	.546	.649	.764
Jacksonville, FL	.677	.708	.372	.489	.681	.665
Kansas City, MO	.609	.726	.425	.509	.645	.710
Las Vegas, NV	.489	.505	.378	.501	.770	.590
Los Angeles, CA	.679	.745	.489	.584	.691	.696
Louisville, KY	.600	.714	.382	.512	.645	.712
Memphis, TN	.793	.799	.565	.651	.692	.742
Miami, FL	.713	.727	.474	.598	.739	.697
Milwaukee, WI	.689	.808	.483	.571	.694	.791

Note: ACS = American Community Survey, CHAS = Comprehensive Housing Affordability Strategy data, ELI = Extremely Low Income, MSA = Metropolitan Statistical Area, PoSH = Picture of Subsidized Households

Appendix Table 8b. Racial dissimilarity index by MSA *continued*

	HCV HOUSEHOLDS, PoSH 2013		COMPARISON HOUSEHOLDS, CHAS 2011			
MSA	ALL VOUCHERS	MINORITY VOUCHERS	HOUSEHOLDS EARNING <$15,000	ELI RENTERS	COST-BURDENED ELI RENTERS	MINORITY ELI RENTERS
Minneapolis, MN	.598	.660	.399	.508	.640	.694
Nashville, TN	.700	.742	.382	.513	.633	.686
New Orleans, LA	.758	.780	.457	.565	.710	.694
New York, NY	.720	.796	.551	.627	.730	.772
Oklahoma City, OK	.650	.700	.382	.494	.623	.636
Orlando, FL	.647	.665	.349	.489	.710	.600
Philadelphia, PA	.706	.759	.513	.587	.731	.760
Phoenix, AZ	.602	.635	.426	.555	.763	.675
Pittsburgh, PA	.622	.774	.332	.469	.594	.739
Portland, OR	.484	.573	.318	.412	.627	.546
Providence, RI	.549	.691	.378	.482	.566	.719
Richmond, VA	.676	.700	.460	.590	.712	.697
Riverside, CA	.586	.611	.376	.513	.650	.606
Rochester, NY	.597	.715	.417	.534	.660	.774
Sacramento, CA	.557	.639	.382	.491	.675	.586
San Antonio, TX	.713	.734	.502	.585	.708	.657
San Diego, CA	.603	.671	.372	.501	.671	.613
San Francisco, CA	.596	.654	.437	.513	.652	.614
San Jose, CA	.595	.623	.380	.484	.616	.555
San Juan, PR	.809	.809	.495	.554	.581	.556
Seattle, WA	.560	.640	.370	.463	.621	.599
St. Louis, MO	.676	.790	.421	.540	.664	.772
Tampa, FL	.584	.631	.310	.497	.775	.674
Virginia Beach, VA	.653	.675	.432	.558	.752	.664
Washington, D.C.	.667	.701	.512	.585	.728	.692

Note: ACS = American Community Survey, CHAS = Comprehensive Housing Affordability Strategy data, ELI = Extremely Low Income, MSA = Metropolitan Statistical Area, PoSH = Picture of Subsidized Households

SECTION 4

Economic Mobility & the Economy

Inequality … of Opportunity and Economic Performance

GUSTAVO A. MARRERO
Universidad de La Laguna

JUAN G. RODRÍGUEZ
Universidad Complutense de Madrid

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Introduction

A major discussion on the primary driving force behind inequality has recently captured the attention of pundits and policymakers. If the root cause of inequality is the change in technology (Goldin and Katz 2008), incomes at the top grow much faster than average because talented and hard-working individuals make significant economic contributions and, therefore, the implied increasing inequality should not be a concern (Mankiw 2013). However, if rent-seeking is the fundamental factor for the growing incomes of the rich (Stiglitz 2012), the resultant increase in inequality would be harmful for posterior development and growth (Piketty, Saez, and Stantcheva 2014). Hence, inequality promotes or deters economic performance depending on the origin of inequality.

The key to address properly this debate on the impact of inequality upon growth is to make a distinction between the different types of inequality, which is a common wisdom in the inequality-of-opportunity literature (Roemer 1993; 1998). Thus, individual income and implied inequality is mainly determined by two factors: first, free-will actions related to the level of exerted effort; second, opportunities, which are beyond the individual's control because they depend on circumstances like gender, race, family background, or health endowments.[1] A deeper analysis on this issue emphasizes that the relevance of these individual circumstances for determining personal income is strongly related with other non-personal circumstances like the macroeconomic conditions of the country where individuals perform their economic activities. For example, the importance of race and gender as major circumstances depends largely on the quality of economic and political institutions (Acemoglu et al. 2015); the impact of parental contacts or networks on individuals' income rests deeply on the degree of corruption and rent-seeking (Stiglitz 2012); the allocation of talent and effort is always conditioned by the conditions for credit to people with unfavorable circumstances (Galor and Zeira 1993).

The crucial hypothesis is that these two types of inequality, inequality of opportunity (IO) and inequality of effort (IE), affect economic performance in an opposite way (World Bank 2006; Bourguignon, Ferreira, and Walton 2007;

1 See, among others, Rodríguez (2008), Ferreira and Gignoux (2011), and Marrero and Rodríguez (2011) and (2012a) for empirical applications.

Marrero and Rodríguez 2013). On one hand, IO reduces growth as, for example, it favors human capital accumulation by individuals with better social origins rather than by individuals with more talent. The greater the IO, the stronger the role that background plays, rather than responsibility. On the other hand, income inequality among those who exert different effort (IE) stimulates growth because, for example, it encourages people to invest in education and effort. Thus, if inequality of effort increases due to technological change or better economic institutions, not only inequality but also growth increases. However, if inequality of opportunity increases due to a pervasive level of corruption or a worsening of credit markets, inequality will increase but economic performance will be dampened. Since both types of inequality act at the same time, they may offset each other, and the discussion on the impact of total inequality on growth could be misleading. In order to avoid this problem, a distinction should be made between both kinds of inequality and attention should be focused on the problematic one, inequality of opportunity.

Following this line of inquiry, this paper presents a panoramic view on the relationship between inequality of opportunity and economic performance. This literature is quite recent but has already produced a growing consensus: inequality of opportunity has significantly harmed growth in the United States. Despite the fact that they follow different approaches and use different databases, three empirical papers have studied this issue for the United States: Marrero and Rodríguez (2013), Hsieh et al. (2013), and Bradbury and Triest (2014). All of them highlight the same main result: relaxing barriers to opportunity is a viable strategy for promoting future economic growth.[2]

On the theoretical side, using an overlapping generation model with human capital, Marrero and Rodríguez (2014) have shown that the negative impact of inequality of opportunity on growth is always true in a developed economy. However, if there exists a trap in the accumulation of human capital (Azariadis and Stachurski 2005), an increase in any kind of inequality (including IO) might be good for growth in poor countries because that would help dynasties with better conditions move upward and get out of the trap (López and Servén 2009; Castelló-Climent and Mukhopadhyay 2013). Nevertheless, using simulations, Marrero and Rodríguez (2014) show that this situation only occurs when the economy is extremely poor (the absolute poverty rate is initially very high). The bottom line is clear, empirical research should be careful when mixing economies with large differences in poverty rates and other crucial characteristics like meritocracy degree.

2 Taking the evolution of IO in the United States between 1970 and 2009 from Marrero and Rodríguez (2011), Marrero and Rodríguez (2012b) analyzes the other way around of the causality. They study how macroeconomic determinants affect inequality of opportunity and inequality of effort in the United States along the 1970–2009 period.

This paper builds on literature that distinguishes individual circumstances, which are beyond the individual's control, and individual effort, which stands in for the range of factors influencing economic success about which an individual can make decisions (Roemer 1993). The next section develops the necessary distinction between the two components of overall inequality—inequality of opportunity and inequality of effort. In addition, the nascent empirical literature on the relationship between inequality of opportunity and economic performance is briefly reviewed. On pages 395–98, based on the theoretical model proposed in Marrero and Rodríguez (2014), a growth equation is derived that relates income growth with the different types of inequality. This equation will serve to explain the existing controversy in the inequality-growth literature and will guide in the development of an alternative less data-consuming cross-country empirical strategy. Pages 398–411 carry out a medium- and long-run cross-country analysis where growth is measured on a 20- , 10- , and 5-year basis between 1990 and 2010, and the cross-section is composed of 77 countries. The main conclusion is robust: inequality of opportunity always harms growth, while total inequality has an unclear impact on subsequent growth. Finally, the last section concludes and comments on some policy measures.

Inequality of Opportunity and Inequality of Effort: A Necessary Distinction

The modern theories of justice emphasize that income inequality is actually a composite measure of IO and inequality of effort (IE).[3] In keeping with this literature, IO refers to that inequality stemming from factors, called circumstances, beyond the scope of individual responsibility like gender, race, socioeconomic background, and macroeconomic conditions (corruption, quality of institutions, etc.). Meanwhile, IE defines the income inequality caused by individual responsible choices, like the number of hours worked or the occupational choice. Overall inequality is, therefore, a combination of IO and IE because individual's outcome (income, wealth, etc.) is a function of variables beyond and within the individual's control. According to this literature, inequality due to circumstances, IO, would be unfair and should be compensated for, while inequality due to individual effort is fair and should be acceptable.

This distinction between fair inequality (IE) and unfair inequality (IO) might be considered irrelevant by a pure positive economist, but fairness

3 See, among others, Roemer (1993), Van de Gaer (1993), Fleurbaey (2008), and Marrero and Rodríguez (2012a).

affects economic incentives and alters individual behavior (Fehr and Schmidt 1999; Fehr and Fischbacher 2003) so it also matters for efficiency. In fact, the literature has recently proposed that each component of total inequality could have a different effect on economic growth (World Bank 2006; Bourguignon, Ferreira, and Walton 2007; Marrero and Rodríguez 2013). On one hand, IO would reduce economic growth as it favors human capital accumulation by individuals with better social origins, rather than by individuals with more talent. Disadvantageous initial circumstances would reduce the opportunity to acquire higher levels of human capital, which would generate a misallocation of talent, underinvestment in human capital, and a negative consequence on growth. On the other hand, income inequality among those who exert different effort would provide incentive for people to invest in education and to work hard, which would stimulate growth. If this hypothesis is true, the impact of total inequality on growth should be ambiguous and the sign would depend on which type of inequality, opportunity or effort, dominates aggregate inequality. Existing theoretical and empirical evidence supports indirectly this view.

On the theoretical side, many channels through which inequality affects growth in opposite ways can be found.[4] The main proposed routes through which inequality might enhance growth are three. First, the larger accumulation of savings by the rich would make inequality good for the proportion of national income that is saved and, therefore, for growth (Kaldor 1956; Stiglitz 1969; Bourguignon 1981). Second, because output depends on unobservable effort, rewarding employees according to output performance would encourage them to exert more effort (Mirrlees 1971; Rebelo 1991). Third, investments in human or physical capital have to go beyond a fixed degree to affect growth, therefore, income and wealth should be sufficiently concentrated (Barro 2000).

On the contrary, inequality in the presence of credit market imperfections would have a negative impact on growth through the investment in human capital channel (Galor and Zeira 1993) and the entrepreneurial channel (Banerjee and Newman 1993). Other channels through which inequality could have a negative effect on growth are the following:

1. The rich have a higher marginal propensity to save but they make many unproductive investments (Mason 1988).

2. Because poor people consume more local goods, their demand favors growth (Marshall 1988).

3. Income inequality exerts a positive effect on the rate of fertility so it reduces per capita growth (Galor and Zang 1997; Kremer and Chen 2002).

4 Surveys on this issue can be found in Bénabou (1996), Aghion, Caroli and García-Peñalosa (1999), Bertola, Foellmi, and Zweimüller (2005), and Ehrhart (2009).

4. By reducing the demand of domestic manufactures, income inequality has a negative impact on growth (Murphy, Schleifer, and Vishny 1989).
5. High levels of inequality provoke large distortionary taxes and, therefore, less private investments and growth (Alesina and Rodrik 1994; Alesina and Perotti 1994; Persson and Tabellini 1994).
6. Political instability and violence are typically fed by high levels of inequality, which harms growth (Gupta 1990).
7. Rent-seeking activities generate a clear miss-allocation of resources and thus inequality of opportunity (because certain profitable activities are not developed by the most talented individuals but those with better social contacts), which deters future growth (Stiglitz 2012).

On the empirical side, the vast empirical literature is also ambiguous.[5] This ambiguity has been justified by different factors:

- the quality of data (Deininger and Squire 1998);
- the econometric method (Forbes 2000);
- the degree of development of the countries under consideration (Barro 2000);
- the model specification (Panizza 2002);
- the type of inequality measures (Székely 2003; Knowles 2005); and
- the replacement of physical capital by human capital accumulation as a prime engine of growth along the process of development (Galor and Moav 2004).

This ambiguous result regarding the impact of overall inequality on growth might be reflecting the fact that some or all of the channels highlighted are working at the same time but in different directions. Following this reasoning, Voitchovsky (2005) estimates inequality among the poor (the 50/10 ratio) and among the rich (the 90/50 ratio), and finds that inequality among the poor deters growth while inequality among the rich enhances growth. In this manner, Voitchovsky (2005) is able to reconcile three alternative theories that relate inequality to growth: existence of constraints in the credit market, political instability, and the accumulation of savings by the rich. The first two ideas would justify the negative effect of inequality among the poor on growth, while the third

5 See Banerjee and Duflo (2003), among others, on the inconclusiveness of the cross-country empirical literature on inequality and growth.

one would explain the positive effect of inequality among the rich on growth.[6]

Alternatively, all the channels could be considered to be actually symptoms of two more encompassing concepts, inequality of opportunity and inequality of effort. For example, considering the credit market imperfections theory (Galor and Zeira 1993; Banerjee and Newman 1993), the claim could be made that people with unfavorable initial circumstances will face considerable barriers for accessing credit, regardless of their talent and degree of effort exerted. As a result, IO would imply suboptimal levels of investment in human capital, with a negative consequence on growth. By the same reasoning, the following models could be advocated.

1. Easterly and Levine (1997) and Gradstein and Justman (2002) report a negative impact of racial and ethnic heterogeneity on growth.

2. Galor and Moav (2004) report that land concentration, which is highly correlated with the proportion of wealth inequality explained by individual circumstances, adversely affects the implementation of human capital promoting institutions like public schooling and child labor regulations.

3. Stiglitz (2012) and Mankiw (2013) report that inequality is mainly explained by rent-seeking activities and technological change, respectively.

In the first case, bad macroeconomic conditions (corruption, low quality of institutions and the like) would raise IO, while in the second case IE would increase because top incomes grow much faster than average when the change in technology get faster.

The problem with the hypothesis that income inequality has two distinct offsetting avenues—IO and IE—affecting subsequent growth in opposite ways, is that direct evidence is difficult to find. On the theoretical side, total inequality has to be decomposed into the IO and IE components and then it has to be shown that more dynasties with bad circumstances raises IO and then harms growth, while higher exerted pure effort—effort not influenced by circumstances—increases IE and then enhances growth. As far as the authors are aware, Marrero and Rodríguez (2014) is the only theoretical model that shows the distinct impact on growth of the two alternative, though complementary, concepts of IO and IE.[7]

6 A similar result has been found by van der Weide and Milanovic (2014) using the U.S. Integrated Public Use Microdata Series (IPUMS) database at the state level for the period of time 1960–2010. In addition, these authors have disaggregated growth by quantiles and have obtained that overall inequality hurts the growth of the poor, while it improves the growth of the rich.

7 The closest model to Marrero and Rodríguez (2014) is Mejia and St-Pierre (2008). They proposed a static model where all circumstances are exogenous and there is no trade-off between the average level of human capital and equality of opportunity.

Taking human capital as the main engine of development, they show that a more equal distribution of opportunity increases growth, while the opposite happens when inequality of effort raises. And their model does not rely on a particular channel (credit markets, accumulation of savings, land ownership, unobservable effort, political economy, etc.), but it relies only on the set of circumstances and the incentives to effort that people have and the way both factors affect human capital accumulation and wages. Hence, the authors believe that this framework is a good starting point to be used as benchmark to characterize, theoretically and empirically, the relationship between inequality of opportunities and growth.

Testing empirically the IO-IE hypothesis is difficult, because the decomposition of overall inequality into the IO and IE components requires not only comparable measures of individual disposable income but also individual circumstances measured in a comparable and homogeneous way. Despite this difficulty, literature has progressed at a high pace during the last years. In a first empirical attempt, Marrero and Rodríguez (2013), using refined data of the Panel Study of Income Dynamics (PSID) database for 26 U.S. states in 1970, 1980, and 1990 found robust evidence that inequality of effort is growth enhancing, while inequality due to differences in opportunities is growth deterring.[8] Under any specification and econometric approach considered by the authors (pooled Ordinary Least Squares (OLS), long-run cross-sectional regressions, fixed effects, and system generalized method-of-moments (GMM) estimators), the impact of the IO component was significantly negative, while the impact of the IE component was significantly positive. According to their estimations, increasing IE by one standard deviation could raise decade growth between 2.3 and 4.1 percentage points depending on the method (the average decade growth in the 1970–2000 period was 20.2 percent), and between 209 and 834 real U.S. dollars per person (the average income in the 1970–2000 period was 14,363 U.S. dollars per person). Meanwhile, decreasing IO by one standard deviation could raise growth between 1.1 and 1.7 percentage points and steady-state income between 124 and 229 real U.S. dollars per person.

This initial result for the case of the United States has been supported by posterior studies. Thus, Hsieh et al. (2013) while adopting a completely different approach, have found that changes in occupational barriers facing women and blacks potentially explain 15 to 20 percent of growth in the

8 The dependent variable was the growth rate of real personal income divided by total midyear population in the entire decade. The explanatory variables were real per capita lagged income, inequality indices (total inequality, IE and IO), and a set of additional control variables, such as human capital, industry mix, farm employment, welfare public expenditures, lag employment growth and fertility rate. Time and regional-fixed effects were also included.

United States between 1960 and 2008. As in Marrero and Rodríguez (2013), the impact on growth is found to be not only damaging but also quite significant. Using the measures of absolute and relative intergenerational mobility in Chetty, Hendren, Kline, and Saez (2014) as proxies of equality of opportunity, Bradbury and Triest (2014) examine the relationship between inequality of opportunity and growth in a cross-section of U.S. "commuting zones."[9] They show a strongly positive effect of absolute mobility on economic growth, while the impact of relative mobility is also positive but weaker. Interestingly, the effect on growth of overall inequality is generally indistinguishable from zero.

Unfortunately, there are only, as far as we are aware, two studies across countries. They try to overcome the scarcity of data, in particular, the problem of observing a large enough sample of personal circumstances for a panel of countries. However, they present serious limitations. In the first, Molina, Narayan, and Saavedra-Chanduvi (2013) making use of a measure of educational opportunities that incorporates inequality between circumstance groups, find that inequality of educational opportunities affects negatively development outcomes such as economic growth, institutional quality, and infant mortality. In particular, their results support the prediction that agricultural endowments—specifically the relative abundance of land suitable for wheat compared to that suitable for sugarcane—predict unequal educational opportunities and this, in turn, predicts development outcomes. Nevertheless, as quoted by Brunori, Ferreira, and Peragine (2013), their measure of educational opportunities is better seen as a development index that is sensitive to inequality of opportunity than as a measure of inequality of opportunity per se. For this reason, it is unsurprising the positive relationship of this index with per capita income.

In the second, Ferreira et al. (2014) construct two new databases consisting of 118 household surveys (of income and expenditure) and 134 Demographic and Health Surveys (DHS) to examine whether IO has a negative effect on subsequent growth. They find that while overall income inequality is generally negatively associated with growth in the household survey sample, there is no evidence that this is due to the IO component. In the DHS sample, both overall wealth inequality and IO have a negative effect on growth in some of their preferred specifications, but the results are not robust to relatively minor changes. One of the main problems of this study is the lack of comparable individual data on circumstances across countries. In fact, the number of types considered in their computation varies considerably

9 Commuting zones are geographic areas representing aggregations of counties, which coincide with metropolitan areas where they exist, and exhaust U.S. territory by also including rural areas.

across countries, from approximately 5 to 1000. Thus, trying to understand their results, the authors comment on the possibility of having substantial amounts of inequality of opportunity contaminating the residual component (the IE component) due to omitted circumstances.

To overcome the inherent difficulty of observing a large enough number of individual circumstances for a panel of countries, this paper develops an alternative empirical exercise to measure the impact of inequality of opportunity on growth and theoretically justifies the empirical growth equation estimated on pages 398–411.

A Growth Equation with Inequality and Inequality of Opportunity

This section presents and comments on the growth equation in Marrero and Rodríguez (2015), which relates income growth with the different types of inequality using as a framework the theoretical model proposed in Marrero and Rodríguez (2014).

Marrero and Rodríguez (2014) presents a small and open economy with perfect competitive markets inhabited by a continuum of dynasties where output per capita and average human capital are one-to-one related, because the second is the key input for the former. Preferences depend positively on private consumption and the bequest devoted to offspring in the form of quality of education (Card and Krueger 1992), but it depends negatively on the level of exerted effort. The degree of disutility generated by total effort depends on the parameter $\gamma(i)$ that is dynasty-specific but independent of any factor in the economy. For this reason, it can be interpreted as a proxy of freewill or pure effort, that is, as the part of total effort that is not influenced by personal circumstances (Roemer 1998; Fleurbeay 2008). Following Bénabou (1996), the distribution of γ is assumed to be a mean-invariant log-normal function with variance Δ_{γ}^{2}.

On the other hand, individual human capital is accumulated according to a convex process that depends on two non-purchasable but complementary factors: total effort and circumstances, $\theta(i)$ (Mejía and St-Pierre 2009). Personal circumstances are assumed to be exogenous to the individual and to follow a mean-invariant log-normal distribution with variance Δ_{a}^{2}. Under log-normality, the variance term is closely related to the class of relative indices consistent with the Lorenz curve, such as the Gini coefficient or the Mean Logarithmic Deviation (Cowell 2009). For this reason and the fact that both, $\theta(i)$ and $\gamma(i)$, are independently distributed, their variances would proxy the IO and IE components of total inequality, respectively.

After solving the model, Marrero and Rodríguez (2014) characterize the dynamics of the average years of schooling and of the variance. Then, using the Mean Logarithmic Deviation as the index of inequality, they are capable of reproducing the classical decomposition in the inequality-of-opportunity literature. Namely, total income inequality, T_0, is additively decomposable into inequality of opportunity, T_0(a), and inequality of effort $T_0(\gamma)$.

Starting from this, Marrero and Rodríguez (2015) calculate the income growth rate and derive the following growth equation:

$$g(y) = b_0 + b_1 \cdot Trend - \beta \cdot \ln y_{t-1} - b_a \cdot T_0(a) + b_\gamma \cdot T \quad (1)$$

where all coefficients are positive and depend on the structural parameters of the model. As it is typical in growth models, equation (1) predicts conditional convergence (i.e., the coefficient associated to $\ln y_{t-1}$ is negative), with a speed of convergence represented by the coefficient β that in our case is inversely related to the elasticity of intergenerational mobility. Note that in a cross-country framework this relationship makes a lot of sense because the lack of convergence is equivalent to the lack of mobility between countries. More importantly, noting that b_a and b_γ are positive, shows that the impact of inequality on growth depends on the type of inequality under consideration: negative for inequality of opportunity, $T_0(a)$; and positive for inequality of pure effort, $T_0(\gamma)$. Their corresponding short-term elasticities are $-b_a$ and b_γ, while their accumulated long-term elasticities are $-b_a / \beta$ and b_γ / β respectively. Since $\beta \in (0, 1)$, long-term elasticities are higher and, therefore, the transmission of the initial impacts of $T_0(a)$ and $T_0(\gamma)$ at the country level depends crucially on the magnitude of intergenerational mobility. It is interesting to note that empirical studies usually focus on the estimation of a reduced form that lacks support from a consistent theory. In this case, the model that gives support to equation (1), the reduced-form equation that relates income growth with the two components of total inequality—IO and IE—at the cross-country level, is an important input.

This model highlights that inequality of opportunity harms economic performance, while inequality of pure effort enhances growth. This result relies on the fact that the accumulation function of individual human capital obtained endogenously in Marrero and Rodríguez (2014) is strictly increasing and concave with respect to circumstances, while it is strictly decreasing and convex with respect to pure effort. Thus, compensating for bad circumstances is growth enhancing since marginal returns to human capital are higher for those individuals who have less favorable circumstances. On the contrary, rewarding the free will to exert effort would enhance growth because the marginal returns to human capital are larger for those individuals with a lower aversion to effort.

It is important to emphasize here that this result is obtained without relying on any particular channel since no assumption is imposed on market imperfections, political economy, savings, and the like. Because the concepts of IO and IE encompass many different avenues through which inequality could affect growth (as proposed by the literature), this broader perspective is proposed to understand better the existing ambiguous empirical relationship between overall inequality and economic performance. In fact, the lack of robustness regarding the impact of total inequality on growth is evident from equation (1). The impact of overall inequality on growth depends on which component, opportunity or pure effort, dominates. Because the impact of total inequality on growth strongly depends on the relative magnitude and elasticity of its components, it cannot be predicted a priory.

Another important implication becomes apparent when comparing equation (1) with the equation usually adopted in the empirical inequality-growth literature. Typically, scholars assume the equation:

$$g(y_{t,j}) = \alpha + \beta_0 \cdot \ln y_{t-1,j} + \beta_1 \cdot I_{t-1,j} + \beta_2 \cdot Z_{t,j-1} + \varepsilon_{t,j} \quad (2)$$

where I is an index of overall inequality, Z is an array of other controls and the subscript j refers to a country or region. In this framework, the set of controls included (or not included) in equation (2) will play a major role in the final sign of β_1. If the controls in Z are more correlated with the IO component, their inclusion in the regression together with I will cause that the coefficient of Z, β_2, captures the effect of IO, while the coefficient of I, β_1, captures better the impact of IE. The opposite would happen if Z is more correlated with the pure effort component of total inequality. In this case, the coefficient β_1 is expected to become less positive (or more negative) because I will behave more as a proxy of inequality of opportunity.

To illustrate this point, use the estimations of IO and IE for a sample of U.S. states and the controls of the baseline model (X) in Marrero and Rodriguez (2013). First estimate equation (2) introducing the IO component as an additional control and then re-estimate the same equation using the IE estimates instead. The results are the following:

$$g(y_{t,j}) = \alpha + \beta_0 \cdot \ln y_{t-1,j} + 93.69^{***} \cdot I_{t-1,j} - 201.43^{***} \cdot IO_{t-1,j} + \delta \cdot X_{t-1,j} + \varepsilon_{t,j} \quad (3)$$

$$g(y_{t,j}) = \alpha + \beta_0 \cdot \ln y_{t-1,j} - 120.29^{***} \cdot I_{t-1,j} + 203.92^{***} \cdot IE_{t-1,j} + \delta \cdot X_{t-1,j} + \varepsilon_{t,j} \quad (4)$$

where the *** means that estimations are significant at 1 percent level. It is clear from above that the coefficients estimated for total inequality are both significant but of opposite signs.

This result is consistent with the empirical evidence found in the literature. Thus, Birdsall, Ross, and Sabot (1995) found that the effect of income

inequality on growth is sensitive to the inclusion of alternative explanatory variables. Meanwhile, Deininger and Squire (1998) found that the impact of initial land inequality—that captures more closely opportunity than income—on growth is significantly negative and robust to the introduction of different explicative variables. As mentioned before, these ideas are used in the next section to propose an alternative empirical strategy to estimate the impact of the different concepts of inequality on growth.

Inequality, Inequality of Opportunity and Growth: A Cross-Country Empirical Proposal

Estimating equation (1) is difficult because it is necessary to decompose previously total inequality into inequality of opportunity and inequality of (pure) effort, which requires microdata of comparable measures of individual income and observed circumstances that span at least two decades and cover a large enough cross section of states or countries. In this respect, Marrero and Rodríguez (2013) for a panel of U.S. states and Ferreira et al. (2014) for a panel of countries are the most prominent proposals in the literature, although they present some difficulties. The main problem with Marrero and Rodríguez (2013) is that they used refined data of the PSID database for 26 states in the 1970s, 1980s, and 1990s to have enough information to estimate IO. In spite of this, the smallness of their survey samples makes IO estimates vulnerable to sampling error. The failure of Ferreira et al. (2014) to find robust support for the main hypothesized relationship, inequality of opportunity harms growth, might be reflecting, as highlighted by Bradbury and Triest (2014), the very spotty set of circumstance variables they eke out of their income and expenditure survey sample and their demographic and health survey sample. Of course, it could also reflect that the relationships estimated by Marrero and Rodriguez (2013) do not apply across nations with different levels of development and institutional backdrops.

To elucidate this important issue, we propose next an alternative empirical strategy to estimate the relationship between growth and the components of overall inequality based on the growth equation presented in the previous section.

The Strategy

First, this paper considers a large database of inequality indices with a big cross-section dimension. In particular, the Gini coefficients from the World Income Inequality Database (UN-WIID2) and Povcal-Net database are used

(López and Servén 2009). Following Dollar and Kraay (2002), the existing heterogeneity of Gini coefficients within the databases is corrected.[10]

Second, a set of variables, *X*, are defined that proxy circumstances at an aggregate level. Milanovic (2015), looking for the degree of global inequality of opportunity, proposed a reduced-form approach relating the annual average household per capita income with two macro variables, the country's gross domestic product (GDP) per capita and the Gini coefficient. His argument is that, in a world where there is no migration, individuals within a particular country make personal decisions under certain macroeconomic characteristics over which they have no control (circumstances) like the GDP per capita and the degree of total inequality. Inspired by this work, inequality of opportunity is proxied by the OLS fitted value of the Gini coefficient on a particular set of macroeconomic variables.

Here corruption, military in power, democracy, fertility, ethnic and religion fractionalization are considered as macro factors because they fulfill three essential properties to proxy inequality of opportunity. First, following Milanovic's argument, these variables are clearly beyond the individual's control so can be treated as circumstances. Second, and more importantly, these variables are closely linked to some of the most important channels identified by the literature, through which inequality may affect growth. In fact, as commented on pages 389–95, these channels are related with a detriment of opportunities and, therefore, with unfair inequality. For example, the empirical literature has found that fertility and political instability are the two more robust channels through which inequality negatively affects growth. In addition, other channels like the capacity of the elite to develop rent-seeking activities (Stiglitz 2012) and the functioning of democracy (Acemoglu et al. 2015) have received large support over the last years. Third, a measurable macroeconomic variable—available for a vast set of countries and years—could proxy for the channels through which the lack of opportunities may affect growth.

To measure the capacity of people to assume positions of power through patronage rather than personal effort and ability, i.e., the level of nepotism and rent-seeking, adopt three variables: an index of corruption (corruption); an index of military in power that estimates the presence of military in government positions (military); and an index of democratic accountability that measures how responsive government is to its people (democracy). Second, in order to account for the importance of race and religion fractionalization, consider the existence of ethnic-linguistic tensions (ethnic) and the degree of

10 Our proposal can be adapted without problem to any other inequality index, for example the Mean logarithmic Deviation. Unfortunately, the Gini coefficient is the only inequality index for which there are enough observations across countries and over time.

religious tensions (religion). Third, to proxy for the opportunity that women have to accumulate human capital we consider the country fertility rate (fertility). Finally, for the sake of robustness, consider as a proxy of parental background the 20-year lag of human capital (HC). The first five variables come from the Political Risk Module of the International Country Risk Database (ICRD).[11] The fertility rates come from the World Bank database and for human capital we use the human capital index recently developed in the Penn World Table (PWT 8.0) (using information from Barro and Lee 2013).

Once this set of variables has been defined, the strategy proposed by Ferreira and Gignoux (2011) is adapted to this case. Making use of micro data, these authors run an OLS regression to estimate individual income as a function of circumstances and then used the fitted part to proxy inequality of opportunity (actually a lower bound of inequality of opportunity). To adapt this proposal to aggregate cross-country data, an OLS regression is run between total inequality (represented by the Gini coefficient) and the set of variables X defined previously as follows:

$$Gini_j = \alpha_0 + \alpha_1 \cdot X_j + v_j \tag{5}$$

At the country level, the fitted part, $\hat{\alpha}_0 + \hat{\alpha}_1 \cdot X_j$, can be taken as a proxy of inequality of opportunity, while the OLS residual, v_j, can be interpreted as the residual part of inequality. This residual picks up the inequality-of-effort component, although it will be contaminated by inequality of opportunity due to unobserved circumstances and luck. For this reason, the interpretation of the sign and significance of its coefficient must be done with caution.

After decomposing the Gini coefficient in its fitted (IO) and residual (referred here as IE by simplicity) components, the following four sequential regressions are run:

$$g(y_{t,j}) = \alpha + \beta \cdot \ln y_{t-1,j} + \rho_{11} \cdot Gini_{t-1,j} + \varepsilon^1_{t,j} \tag{6}$$

$$g(y_{t,j}) = \alpha + \beta \cdot \ln y_{t-1,j} + \rho_{12} \cdot Gini_{t-1,j} + \rho_{21} \cdot IO_{t-1,j} + \varepsilon^2_{t,j} \tag{7}$$

$$g(y_{t,j}) = \alpha + \beta \cdot \ln y_{t-1,j} + \rho_{13} \cdot Gini_{t-1,j} + \rho_{31} \cdot IE_{t-1,j} + \varepsilon^3_{t,j} \tag{8}$$

$$g(y_{t,j}) = \alpha + \beta \cdot \ln y_{t-1,j} + \rho_{22} \cdot IO_{t-1,j} + \rho_{32} \cdot IE_{t-1,j} + \varepsilon^4_{t,j} \tag{9}$$

Equation (6), the regression of reference, is a standard inequality-growth equation corresponding to equation (2). Equation (9) is a particular version of our theoretical reduced form (equation (1)). Meanwhile, equations (7) and (8) are robustness checks related with (3) and (4), which come from the theory as

11 These variables are explained in detail in the appendix.

well. According to the theory presented in the previous section, the relationships between the different estimates of ρ should be the following:

R1. The sign and significance of the coefficients of overall inequality, ρ_{11}, ρ_{12}, ρ_{13} are not determined a priori because they depend on the set of controls specified in the regression. First, the sign of the coefficient ρ_{11} depends on which component, opportunity or effort, drives the Gini coefficient. Second, if Z = IO (equation (7)), $\rho_{12} > \rho_{11}$, and desirable $\rho_{12} > 0$ because the Gini coefficient get closer to inequality of effort. On the contrary, if Z = IE (equation (8)), $\rho_{13} < \rho_{11}$, and desirable $\rho_{13} < 0$ because in this case the Gini index proxy inequality of opportunity.

R2. The coefficients ρ_{21} and ρ_{22} must be negative since they capture the effect of the (lower bound) IO component on growth.

R3. In principle, the coefficients ρ_{31} and ρ_{32} should be positive but, as mentioned previously, the IE component is actually a residual (contaminated by some unobserved inequality of opportunity) so the only prediction we can make for sure is that these coefficients will be higher than the coefficients corresponding to the Gini coefficient.

Results

There were three main econometric difficulties of the empirical proposal for this paper. First, there could be a problem of endogeneity since inequality and growth are simultaneously determined. However, the empirical setting, like standard growth regression models, lacks obvious outside instruments to deal with this problem (this situation also happens for example in Acemoglu et al. 2015). To alleviate this problem, all regressors in (6)–(9) will be predetermined variables because they will be lagged 20, 10, or 5 years, depending on the specification. Second, there may be country-specific effects potentially correlated with the explanatory variables and, third, possible endogeneity of all other regressors. To address the last two problems, in the absence of suitable external instruments, this paper applies the system-GMM approach and checks the robustness of the results to alternative model specifications and econometric methods (pooled-OLS, fixed effects, instrumental variable generalized two stage least square (G2SLS)). In addition, the variance-covariance matrix will always be estimated using a robust method and for the system-GMM case, this matrix will be corrected for the problem of finite samples following Windmeijer (2005).

In table 1 the estimates of equation (5) are presented using the entire sample. Overall inequality is decomposed into inequality of opportunity and inequality of effort according to the variables included in X so neither regional nor time dummies are included as in Ferreira and Guignoux (2011). Three versions of the regression in equation (5) are run to check the robustness of the results. In

the first model, only the variables of the Political Risk Module, i.e., corruption, military, democracy, ethnic and religion is considered. In the second model, the fertility rate is introduced across countries. Additionally, the 20-year lag of human capital is included in the last model.

As expected, more corruption and military power (that is, lower meritocracy and opportunity) increase significantly total inequality. The quality of democracy has no significant influence on inequality. This result accords with Acemoglu et al. (2015) where democratization is found to have a statistically weak effect on inequality since democracy lowers barriers to entry and improves the investment in public goods, while simultaneously bringing economic change, which increases inequality. The literature has found that ethnic-linguistic fractionalization is bad for growth, while religious fractionalization enhances growth (Alesina et al. 2003). In a similar manner, different effects are found for these two types of tensions; ethnic-linguistic tensions have no significant effects on inequality, while religious tensions reduce overall inequality. It seems that a society with a higher diversity of religions provides more opportunities to its citizens. Also, worse social conditions for women—represented by a higher fertility rate—are found to have a significant negative effect on the degree of equality. Finally, a higher average of parental human capital, proxy by the 20-year lag of human capital, is found to reduce overall inequality. Looking at the three columns in table 1, these results are robust to the specification under consideration. From now on, the results in specification (b) will be used to avoid potential problems of collinearity. In some specifications of the growth equation (see subsequent), the human capital will be considered, among other controls, so collinearity between this variable and the IO and IE indices could appear.

After measuring the proxy of IO and IE components, the regression analysis is started by considering the growth rate between 1990 and 2010 (an interval of 20 years), and all explicative variables at 1990. Data availability restricts the final sample to a cross-country section of 69 observations. Table 2 shows the long-run pool-OLS estimates of equations (6)–(9) for that cross-country section. The first panel of regressions include only time and regional dummies; the second panel, following Forbes (2000), also includes human capital and the price of investment; finally, the third panel adds the size of the government and the degree of openness. These variables, the price of investment, the size of the government and the degree of openness are from the Penn World Tables. Results are consistent with the previous theory (the R1, R2, and R3 predictions exposed previously) and robust to the three panels. In addition, human capital is significantly positive for growth in the extended version of the Forbes specification; the price of investment, as a proxy of the degree of market imperfections, has a negative effect on growth; the size of government plays no role for long-run growth; and, the degree of openness has a positive influence on future growth.

Table 1: Decomposition of the Gini coefficient

	(A)	(B)	(C)
Corruption	0.0138***	**0.0149*** **	0.0163***
	(3.73)	**(4.30)**	(4.03)
Military	0.0164***	**0.0079** **	0.0080*
	(4.51)	**(2.10)**	(1.90)
Democracy	−0.0061	**0.0008**	0.0043
	(-1.61)	**(0.24)**	(1.07)
Ethnic	0.0013	**−0.0018**	−0.0018
	(0.37)	**(−0.57)**	(−0.53)
Religion	−0.0166***	**−0.0219*** **	−0.0242***
	(-4.66)	**(−6.48)**	(−6.46)
Fertility		**0.0248*** **	0.0205***
		(8.37)	(5.38)
L4.HC			−0.0320***
			(−2.77)
_cons	0.3710***	**0.2920*** **	0.3590***
	(14.76)	**(12.41)**	(9.79)
N	480	**474**	400
adj. R-sq	0.179	**0.297**	0.328

Note: t statistics in parentheses. *p<0.10; **p<0.05; ***p<0.01

For illustrative purposes, figures 1a–1c show the main intuition of the results, which show similar information as those in Marrero and Rodriguez (2013) for the case of the United States. They show the different scatter plots between growth and the alternative measures of inequality (after adjusting by time and regional dummies and initial log of per capita GDP). The first scatter plot relates growth with initial total inequality and its relationship is slightly positive but clearly non-significant. figure 1b shows how the relationship with our measure of inequality of opportunity is clearly negative, while the third scatter plot relates growth with initial residual inequality and finds a positive and significant slope.

In order to increase the number of observations, the interval of time is reduced to calculate the growth rates. First, r intervals of 10 years are considered so the number of observations increases to 158 (two waves in the case of most countries). For this new panel of data alternative econometric approaches

Figures 1A-C. Inequality, IO, IE, and growth (long-run cross-country analysis–20 years interval)

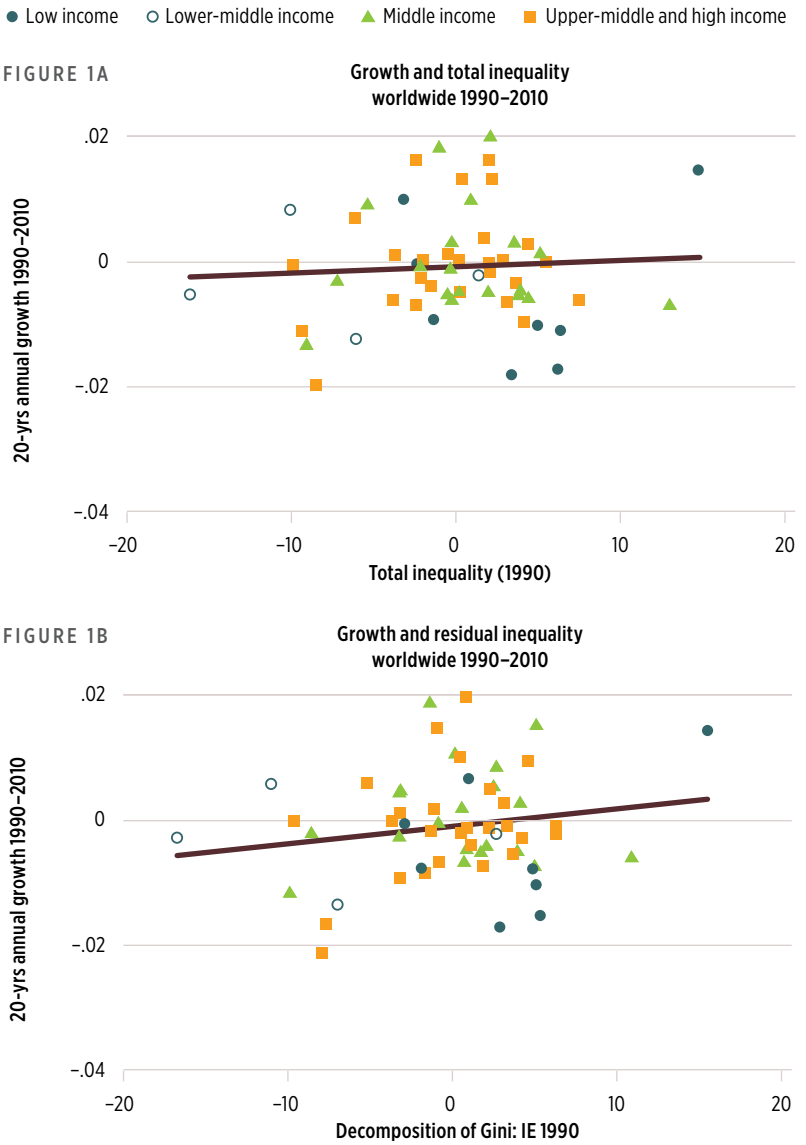

FIGURE 1C

Note: Variables in the axes are OLS adjusted by initial log of per capita GDP, time dummies, and regional dummies.

are applied: pool-OLS (table 3); fixed effects (table 4); and G2SLS (Balestra and Varadharajan-Krishnakumar 1987) to correct for potential endogeneity problems (table 5). Again, the empirical results are consistent with the proposal. In particular, the predictions R1, R2, and R3 are generally fulfilled.

Finally, whether the long-run (10- and 20-year interval) results apply also to a 5-year interval growth model is checked. In this case, the time series dimension increases to 389 observations, so more sophisticated econometric techniques to correct for endogeneity can be applied. In this respect, the system-GMM technique developed by Blundell and Bond (1998) is used. The one-step version is adopted because, in contrast with the two-step version, it has standard errors that are asymptotically robust to heteroskedasticity and are more reliable for finite sample inference (Blundell and Bond 1998; Bond, Hoeffler, and Temple 2001). In addition, Roodman (2009) is followed and the set of instruments validated by using the Hansen *J*-test, in accordance with this test lag (1, 3) are taken.[12] The results for pool-OLS in table 6 and one-step system-GMM in table 7 accord with previous findings and conclude again that the initial inequality-of-opportunity component exerts a negative and significant effect on subsequent growth.

12 When using the two-step system-GMM technique the results are very similar. Meanwhile, when reducing the number of instruments by using the collapse option in the *xtabond2* command in Stata, the same qualitative results are obtained but the Hansen *p*-values get lower.

Table 2. The effect of inequality of outcomes and opportunity on growth (20 years: 1990–2010)

(POOL-OLS; decomposition (b) of the Gini coefficient)

	SIMPLE MODEL (WITH TIME & REG. DUMMIES)				FORBES MODEL (WITH TIME & REG. DUMMIES)				EXT. FORBES MODEL (WITH TIME & REG. DUMMIES)			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
L4.log y	-0.0052	-0.0087	-0.0087	-0.0087	-0.0091*	-0.0123**	-0.0123**	-0.0123**	-0.0099**	-0.0131***	-0.0131***	-0.0131***
	(-1.16)	(-1.67)	(-1.67)	(-1.67)	(-1.70)	(-2.23)	(-2.23)	(-2.23)	(-2.20)	(-2.95)	(-2.95)	(-2.95)
L4.Gini	**-0.0299**	**-0.0248**	**-0.1310****		**-0.0109**	**-0.0042**	**-0.1220****		**-0.0156**	**-0.0087**	**-0.1160****	
	(-1.04)	**(-0.85)**	**(-2.49)**		**(-0.43)**	**(-0.18)**	**(-2.28)**		**(-0.63)**	**(-0.37)**	**(-2.26)**	
L4.IO		**-0.1070****		**-0.1310****		**-0.1180****		**-0.1220****		**-0.1070****		**-0.1160****
		(-2.12)		**(-2.49)**		**(-2.60)**		**(-2.28)**		**(-2.48)**		**(-2.26)**
L4.IE			**0.1070****	**-0.0248**			**0.1180****	**-0.0042**			**0.1070****	**-0.0087**
			(2.12)	**(-0.85)**			**(2.60)**	**(-0.18)**			**(2.48)**	**(-0.37)**
L4.HC					0.0098**	0.0076	0.0076	0.0076	0.0101**	0.0083*	0.0083*	0.0083*
					(2.09)	(1.59)	(1.59)	(1.59)	(2.40)	(1.95)	(1.95)	(1.95)
L4.price inv.					-0.0029***	-0.0031***	-0.0031***	-0.0031***	-0.0036***	-0.0037***	-0.0037***	-0.0037***
					(-6.29)	(-6.35)	(-6.35)	(-6.35)	(-5.55)	(-5.56)	(-5.56)	(-5.56)
L4.Gov. Size									0.000738	0.000588	0.000588	0.000588
									(1.55)	(1.31)	(1.31)	(1.31)
L4.Openness									0.000047*	0.000052*	0.000052*	0.000052*
									(1.70)	(1.84)	(1.84)	(1.84)
_cons	0.0920**	0.1620**	0.1620**	0.1620**	0.0966**	0.1730***	0.1730***	0.1730***	0.0952**	0.1670***	0.1670***	0.1670***
	(2.11)	(2.60)	(2.60)	(2.60)	(2.21)	(2.98)	(2.98)	(2.98)	(2.56)	(3.49)	(3.49)	(3.49)
N	69	69	69	69	69	69	69	69	69	69	69	69
adj. R-sq	0.211	0.251	0.251	0.251	0.314	0.365	0.365	0.365	0.363	0.404	0.404	0.404

Note: t statistics in parentheses. *p<0.10; **p<0.05; ***p<0.01

Table 3. The effect of inequality of outcomes and opportunity on growth (10 years: 1990–2000 & 2000–10)

(POOL-OLS; decomposition (b) of the Gini coefficient)

	SIMPLE MODEL (WITH TIME & REG. DUMMIES)				FORBES MODEL (WITH TIME & REG. DUMMIES)				EXT. FORBES MODEL (WITH TIME & REG. DUMMIES)			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
L2.log y	-0.0121***	-0.0161***	-0.0161***	-0.0161***	-0.0152***	-0.0177***	-0.0177***	-0.0177***	-0.0146***	-0.0174***	-0.0174***	-0.0174***
	(-5.63)	(-6.86)	(-6.86)	(-6.86)	(-6.04)	(-7.04)	(-7.04)	(-7.04)	(-5.93)	(-7.06)	(-7.06)	(-7.06)
L2.Gini	**0.0099**	**0.0138**	**-0.1560*** **		**0.0132**	**0.0185**	**-0.1290*** **		**0.0136**	**0.0180**	**-0.1210*** **	
	(0.50)	**(0.70)**	**(-3.64)**		**(0.70)**	**(1.02)**	**(-2.92)**		**(0.73)**	**(1.00)**	**(-2.80)**	
L2.IO		**-0.1690*** **		**-0.1560*** **		**-0.1480*** **		**-0.1290*** **		**-0.1390*** **		**-0.1210*** **
		(-4.12)		**(-3.64)**		**(-3.54)**		**(-2.92)**		**(-3.33)**		**(-2.80)**
L2.IE			**0.1690*** **	**0.0138**			**0.1480*** **	**0.0185**			**0.1390*** **	**0.0180**
			(4.12)	**(0.70)**			**(3.54)**	**(1.02)**			**(3.33)**	**(1.00)**
L2.HC					0.0135***	0.0098**	0.0098**	0.0098**	0.0128***	0.0095**	0.0095**	0.0095**
					(3.53)	(2.46)	(2.46)	(2.46)	(3.27)	(2.39)	(2.39)	(2.39)
L2.price inv.					-0.0034***	-0.0034***	-0.0034***	-0.0034***	-0.0039***	-0.0037***	-0.0037***	-0.0037***
					(-7.42)	(-8.21)	(-8.21)	(-8.21)	(-5.93)	(-6.14)	(-6.14)	(-6.14)
L2.Gov. Size									0.000533	0.000304	0.000304	0.000304
									(1.19)	(0.72)	(0.72)	(0.72)
L2.Openness									0.000027	0.000029	0.000029	0.000029
									(0.86)	(0.94)	(0.94)	(0.94)
_cons	0.1350***	0.2330***	0.2330***	0.2330***	0.1300***	0.2160***	0.2160***	0.2160***	0.1200***	0.2050***	0.2050***	0.2050***
	(5.80)	(7.08)	(7.08)	(7.08)	(5.67)	(6.75)	(6.75)	(6.75)	(5.30)	(6.52)	(6.52)	(6.52)
N	158	158	158	158	158	158	158	158	158	158	158	158
adj. R-sq	0.298	0.357	0.357	0.357	0.373	0.414	0.414	0.414	0.380	0.414	0.414	0.414

Note: t statistics in parentheses. *p<0.10; **p<0.05; ***p<0.01

Table 4. The effect of inequality of outcomes and opportunity on growth (10 years: 1990–2000 & 2000–10)

(FE; decomposition (b) of the Gini coefficient)

	SIMPLE MODEL (WITH TIME DUMMIES)				FORBES MODEL (WITH TIME DUMMIES)				EXT. FORBES MODEL (WITH TIME DUMMIES)			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
L2.log y	-0.0640**	-0.0609**	-0.0609**	-0.0609**	-0.0632*	-0.0594**	-0.0594**	-0.0594**	-0.0629*	-0.0592**	-0.0592**	-0.0592**
	(-2.03)	(-2.21)	(-2.21)	(-2.21)	(-1.98)	(-2.14)	(-2.14)	(-2.14)	(-1.92)	(-2.06)	(-2.06)	(-2.06)
L2.Gini	**0.0448**	**0.0497**	**-0.1590**		**0.0486**	**0.0566**	**-0.1630**		**0.0485**	**0.0643**	**-0.1640**	
	(0.96)	**(1.01)**	**(-1.55)**		**(1.05)**	**(1.12)**	**(-1.60)**		**(1.37)**	**(1.67)**	**(-1.57)**	
L2.IO		**-0.2090****		**-0.1590**		**-0.2190****		**-0.1630**		**-0.2280****		**-0.1640**
		(-2.17)		**(-1.55)**		**(-2.20)**		**(-1.60)**		**(-2.32)**		**(-1.57)**
L2.IE			**0.2090****	**0.0497**			**0.2190****	**0.0566**			**0.2280****	**0.0643**
			(2.17)	**(1.01)**			**(2.20)**	**(1.12)**			**(2.32)**	**(1.67)**
L2.HC					-0.0051	-0.0088	-0.0088	-0.0088	-0.0045	-0.0093	-0.0093	-0.0093
					(-0.23)	(-0.50)	(-0.50)	(-0.50)	(-0.20)	(-0.49)	(-0.49)	(-0.49)
L2.price inv.					-0.0022	-0.0039	-0.0039	-0.0039	-0.0020	-0.0033	-0.0033	-0.0033
					(-0.25)	(-0.66)	(-0.66)	(-0.66)	(-0.20)	(-0.46)	(-0.46)	(-0.46)
L2.Gov. Size									-0.000016	-0.00046	-0.00046	-0.00046
									(-0.01)	(-0.26)	(-0.26)	(-0.26)
L2.Openness									-0.000018	0.000016	0.000016	0.000016
									(-0.15)	(0.16)	(0.16)	(0.16)
_cons	0.5570**	0.6110***	0.6110***	0.6110***	0.5620*	0.6230***	0.6230***	0.6230***	0.5600*	0.6260**	0.6260**	0.6260**
	(2.03)	(2.71)	(2.71)	(2.71)	(1.99)	(2.71)	(2.71)	(2.71)	(1.94)	(2.59)	(2.59)	(2.59)
N	158	158	158	158	158	158	158	158	158	158	158	158
adj. R-sq	0.341	0.433	0.433	0.433	0.336	0.437	0.437	0.437	0.328	0.433	0.433	0.433
N_g	96	96	96	96	96	96	96	96	96	96	96	96

Note: t statistics in parentheses. *p<0.10; **p<0.05; ***p<0.01

Table 5. The effect of inequality of outcomes and opportunity on growth (10 years: 1990–2000 & 2000–10)

(IV: G2SLS; decomposition (b) of the Gini coefficient)

	SIMPLE MODEL (WITH TIME & REG. DUMMIES)				FORBES MODEL (WITH TIME & REG. DUMMIES)				EXT. FORBES MODEL (WITH TIME & REG. DUMMIES)			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
L2.log y	-0.0107***	-0.0176***	-0.0176***	-0.0176***	-0.0158***	-0.0192***	-0.0192***	-0.0192***	-0.0151***	-0.0192***	-0.0192***	-0.0192***
	(-4.58)	(-5.51)	(-5.51)	(-5.51)	(-5.11)	(-5.48)	(-5.48)	(-5.48)	(-4.80)	(-5.07)	(-5.07)	(-5.07)
L2.Gini	**-0.0479**	**-0.0312**	**-0.3870*** **		**-0.0429**	**-0.0276**	**-0.3320*** **		**-0.0337**	**-0.0251**	**-0.3100** **	
	(-1.31)	**(-0.84)**	**(-3.31)**		**(-1.11)**	**(-0.79)**	**(-2.70)**		**(-0.91)**	**(-0.72)**	**(-2.40)**	
L2.IO		**-0.3550*** **		**-0.3870*** **		**-0.3040*** **		**-0.3320*** **		**-0.2850** **		**-0.3100** **
		(-3.38)		**(-3.31)**		**(-2.66)**		**(-2.70)**		**(-2.38)**		**(-2.40)**
L2.IE			**0.3550*** **	**-0.0312**			**0.3040*** **	**-0.0276**			**0.2850** **	**-0.0251**
			(3.38)	**(-0.84)**			**(2.66)**	**(-0.79)**			**(2.38)**	**(-0.72)**
L2.HC					0.0179***	0.0097*	0.0097*	0.0097*	0.0169***	0.0103*	0.0103*	0.0103*
					(3.63)	(1.84)	(1.84)	(1.84)	(3.48)	(1.95)	(1.95)	(1.95)
L2.price inv.					-0.0063	-0.0035	-0.0035	-0.0035	-0.0054	-0.0028	-0.0028	-0.0028
					(-1.61)	(-0.80)	(-0.80)	(-0.80)	(-1.37)	(-0.66)	(-0.66)	(-0.66)
L2.Gov. Size									0.00075*	0.00024	0.00024	0.00024
									(1.74)	(0.51)	(0.51)	(0.51)
L2.Openness									0.000031	0.000031	0.000031	0.000031
									(1.08)	(1.12)	(1.12)	(1.12)
_cons	0.1470***	0.3360***	0.3360***	0.3360***	0.1490***	0.3060***	0.3060***	0.3060***	0.1320***	0.2910***	0.2910***	0.2910***
	(5.00)	(4.92)	(4.92)	(4.92)	(5.12)	(4.23)	(4.23)	(4.23)	(4.49)	(3.71)	(3.71)	(3.71)
N	113	113	113	113	113	113	113	113	113	113	113	113
N_g	73	73	73	73	73	73	73	73	73	73	73	73

Note: t statistics in parentheses. *p<0.10; **p<0.05; ***p<0.01

Table 6. The effect of inequality of outcomes and opportunity on growth (5 years: 1985–2010)

(POOL-OLS; decomposition (b) of the Gini coefficient)

	SIMPLE MODEL (WITH TIME & REG. DUMMIES)				FORBES MODEL (WITH TIME & REG. DUMMIES)				EXT. FORBES MODEL (WITH TIME & REG. DUMMIES)			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
L.log y	-0.0092***	-0.0122***	-0.0122***	-0.0122***	-0.0119***	-0.0142***	-0.0142***	-0.0142***	-0.0118***	-0.0141***	-0.0141***	-0.0141***
	(-5.00)	(-5.82)	(-5.82)	(-5.82)	(-5.59)	(-6.41)	(-6.41)	(-6.41)	(-5.55)	(-6.34)	(-6.34)	(-6.34)
L.Gini	**0.0062**	**0.0106**	**-0.1270*** **		**0.0199**	**0.0247**	**-0.1080*** **		**0.0190**	**0.0229**	**-0.0998** **	
	(0.37)	**(0.61)**	**(-3.31)**		**(1.21)**	**(1.49)**	**(-2.84)**		**(1.16)**	**(1.39)**	**(-2.53)**	
L.IO		**-0.1380*** **		**-0.1270*** **		**-0.1330*** **		**-0.1080*** **		**-0.1230*** **		**-0.0998** **
		(-3.52)		**(-3.31)**		**(-3.59)**		**(-2.84)**		**(-3.21)**		**(-2.53)**
L.IE			**0.1380*** **	**0.0106**			**0.1330*** **	**0.0247**			**0.1230*** **	**0.0229**
			(3.52)	**(0.61)**			**(3.59)**	**(1.49)**			**(3.21)**	**(1.39)**
L.HC					0.0116***	0.0090**	0.0090**	0.0090**	0.0108***	0.0086**	0.0086**	0.0086**
					(3.33)	(2.56)	(2.56)	(2.56)	(3.12)	(2.47)	(2.47)	(2.47)
L.price inv.					-0.0045***	-0.0048***	-0.0048***	-0.0048***	-0.0051***	-0.0051***	-0.0051***	-0.0051***
					(-5.34)	(-5.86)	(-5.86)	(-5.86)	(-5.45)	(-5.57)	(-5.57)	(-5.57)
L.Gov. Size									0.00053	0.00035	0.00035	0.00035
									(1.54)	(1.01)	(1.01)	(1.01)
L.Openness									0.000056**	0.000056**	0.000056**	0.000056**
									(2.37)	(2.42)	(2.42)	(2.42)
_cons	0.1140***	0.1910***	0.1910***	0.1910***	0.1070***	0.1820***	0.1820***	0.1820***	0.0991***	0.1710***	0.1710***	0.1710***
	(6.19)	(6.69)	(6.69)	(6.69)	(6.00)	(6.75)	(6.75)	(6.75)	(5.36)	(5.97)	(5.97)	(5.97)
N	389	389	389	389	389	389	389	389	389	389	389	389
adj. R-sq	0.165	0.186	0.186	0.186	0.210	0.228	0.228	0.228	0.223	0.237	0.237	0.237

Note: t statistics in parentheses. *p<0.10; **p<0.05; ***p<0.01

Table 7. The effect of inequality of outcomes and opportunity on growth (5 years: 1985–2010)

(System-GMM (1 step; lag(1,3)); decomposition (b) of the Gini coefficient)

	SIMPLE MODEL (WITH TIME DUMMIES)				FORBES MODEL (WITH TIME DUMMIES)				EXT. FORBES MODEL (WITH TIME DUMMIES)			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
L.log y	-0.0008	-0.0145***	-0.0155***	-0.0165***	-0.0145***	-0.0210***	-0.0207***	-0.0214***	-0.0147***	-0.0211***	-0.0206***	-0.0212***
	(-0.18)	(-3.35)	(-3.20)	(-3.63)	(-3.83)	(-4.78)	(-4.58)	(-4.92)	(-3.83)	(-5.03)	(-4.88)	(-5.06)
L.Gini	**-0.1330*** **	**-0.0249**	**-0.6380*** **		**-0.0117**	**0.0327**	**-0.4090*** **		**-0.0319**	**0.0172**	**-0.351*** **	
	(-2.91)	**(-0.66)**	**(-4.93)**		**(-0.31)**	**(1.01)**	**(-4.65)**		**(-1.10)**	**(0.67)**	**(-5.02)**	
L.IO		**-0.5790*** **		**-0.6410*** **		**-0.4410*** **		**-0.4410*** **		**-0.3740*** **		**-0.3770*** **
		(-5.40)		**(-5.61)**		**(-5.06)**		**(-4.96)**		**(-5.23)**		**(-5.39)**
L.IE			**0.6130*** **	**-0.0596**			**0.4430*** **	**0.0092**			**0.3680*** **	**-0.0018**
			(4.99)	**(-1.48)**			**(4.86)**	**(0.26)**			**(4.95)**	**(-0.06)**
L.HC					0.0370***	0.0184*	0.0183*	0.0150	0.0324***	0.0206**	0.0205**	0.0183**
					(4.28)	(1.83)	(1.86)	(1.46)	(3.90)	(2.30)	(2.34)	(2.03)
L.price inv.					-0.0061***	-0.0073***	-0.0073***	-0.0071***	-0.0068***	-0.0065***	-0.0067***	-0.0065***
					(-2.90)	(-3.07)	(-3.05)	(-2.92)	(-3.52)	(-4.03)	(-4.05)	(-3.83)
L.Gov. Size									0.00076	0.00019	0.00031	0.00024
									(0.95)	(0.25)	(0.42)	(0.31)
L.Openness									0.00014***	0.00010**	0.00011***	0.00011**
									(3.18)	(2.48)	(2.70)	(2.54)
_cons	-5.5210***	-6.0090***	-6.1810***	-6.2160***	0.6210	-2.0140	-2.0750	-2.7180	0.9000	-0.6540	-0.5860	-1.0860
	(-3.24)	(-2.79)	(-2.78)	(-2.85)	(0.30)	(-0.76)	(-0.79)	(-1.00)	(0.45)	(-0.26)	(-0.24)	(-0.42)
N	389	389	389	389	389	389	389	389	389	389	389	389
Hansen-p	0.00342	0.0499	0.0562	0.0659	0.253	0.315	0.316	0.264	0.850	0.730	0.738	0.632
ar1-p	0.000749	0.000789	0.000761	0.00116	0.000438	0.000367	0.000368	0.000510	0.000576	0.000703	0.000765	0.000948
ar2-pp	0.225	0.258	0.244	0.254	0.0896	0.147	0.148	0.144	0.131	0.316	0.344	0.323
N_g	108	108	108	108	108	108	108	108	108	108	108	108
j	42	49	49	45	82	83	83	79	122	117	117	113

Note: t statistics in parentheses. *p<0.10; **p<0.05; ***p<0.01

Concluding Remarks

The literature on equality of opportunity affirms that overall inequality is actually a composite measure of inequality of opportunity and inequality of effort. Thus, the outcome of an individual (income, education, or occupation) is in fact the result of, at least, two main sets of factors. First, those factors beyond the individual's control (taken as given at birth), called circumstances, and which are related with parental background (including parental income, education, social position, etc.), and also with gender, race, ethnicity, religion, or macroeconomic conditions of the individual's birth place, such as the level of corruption or democracy. Second, it is the set of factors related with free-will action to exert effort and take risks in entrepreneurship activities, or with an individual's ability or talent. The former set of factors determines the level of IO, while the second defines the extent of IE.

The hypothesis defended in this paper is that the impact of overall inequality on economic performance is ambiguous because the two main components of inequality have opposite effects on growth: IO negative and IE positive. After revising the existing evidence for this hypothesis, a novel cross-country analysis is contributed. Applying a long-run cross-country analysis, this paper concludes that inequality of opportunity always harms growth, while total inequality has an unclear impact on subsequent growth.

Accordingly, governments must be aware of implementing general redistribution policies. These policies might affect total inequality but without knowing which type of inequality is being affected. This finding is in line with Ostry, Berg, and Tsangarides (2014), who find that some redistribution can reduce inequality and is good for growth (maybe because it reduces IO), but too much redistribution is growth deterring (maybe because, too much redistribution ends up reducing IE). The bottom line for policymakers is clear, they should focus on reducing IO while improving incentives to effort, which reduces unfair inequality and promotes growth.

This could be achieved with affirmative-action policies applied to people with bad circumstances, such as

- policies that implement cash transfers conditional on specific behaviors, such as school attendance;[13]
- early childhood development interventions through family visits by social workers;

13 The programs *Oportunidades* in Mexico and *Bolsa Família* in Brazil are two relevant examples of this kind of policies.

- policies that facilitate the access of individuals to education through higher public funding and the reduction of constraints in private credit markets to pay for fees and other schooling costs;
- interventions to increase learning rates at public schools and reduce teacher-absenteeism;
- health interventions to increase basic knowledge of nutrition, hygiene and sexuality.

With respect to the most advantaged people, policies could include

- improving the design of institutions like the financial system to be both efficient and resilient to capture;
- a better design of the regulatory framework for the privatization and running of utilities with natural monopoly power;
- interventions to improve the management of the commons and to avoid the capture of delivery of services and transfers by local elite.

Thus, fighting against rent-seeking activities and corruption would reduce unfair inequality (IO) and would improve the allocation of resources, increasing efficiency and future growth.

To finish, the authors point out that the findings in this paper allow for the reinterpretation of several relevant results in the inequality-growth literature. For example, Barro (2000) found that the relationship between inequality and growth is negative for less developed countries while it is positive for developed ones. The interpretation in this paper would be that the importance (share) of IO with respect to overall inequality is higher in less developed countries than in more developed countries, and for this reason the relationship is not linear.

A second example worth mentioning is the set of results in Acemoglu, Gallego, and Robinson (2014) and Acemoglu et al. (2015). In the first paper the authors provide strong evidence that democracy has a significant and robust positive impact on GDP and growth, while in the second they emphasize that "Democratization has a statistically weak effect on inequality." The argument exposed by these authors is that "*Democracy may be bringing new opportunities and economic change, which may increase inequality, while simultaneously lowering barriers to entry and investing in public goods, which may reduce inequality.*" This paper interprets these results as democracy creates better rules that incentive effort increasing IE, while at the same time, democracy reduces IO by reducing barriers to entry. Despite that the effect of democracy on overall inequality is unclear because it raises IE but reduces IO, its effect on growth is well defined since democracy enhance growth through both channels. ■

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Appendix

The way the variables from the Political Risk Module of the International Country Risk Database (ICRD) are constructed is briefly explained. In all cases, the variables go from 1 (lowest value) to 6 (highest value).

The **index of corruption** within the political system measures: suspiciously close ties between politics and business; demands for special payments and bribes connected with import and export licenses, exchange controls, tax assessments, police protection, or loans; nepotism; job reservations; "favor-for-favors"; and, secret party funding.

The **military** in power assesses the involvement of the military in politics. The military is not elected by anyone so its involvement is always a diminution of democratic accountability. It usually indicates that the government is unable to function effectively or that there exist an actual or created internal or external threat.

The **index of democracy** measures how responsive government is to its people. The points are awarded on the basis of the type of governance enjoyed by the country: autarchy; de jure one-party state; de facto one-party state; dominated democracy; and alternating democracy.

The **index of ethnic tensions** assesses the degree of tension within a country attributable to racial, nationality, or language divisions. Higher values correspond to countries where racial and nationality tensions are high because opposing groups are intolerant. Lower values correspond to countries where tensions are minimal.

The **index of religious tensions** measures the degree of tension that may stem from the domination of society by a single religious group that seeks to replace civil law by religious law and to exclude other religions from the political and social process. This index ranges from inexperienced people imposing inappropriate policies through civil dissent to civil war.

Skills, Mobility, and Growth

ERIC A. HANUSHEK
Stanford University

LUDGER WOESSMANN
University of Munich

Hoover Institution/Stanford University and NBER; Ifo Institute and University of Munich, respectively.
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Introduction

Human capital investment has been seen as a primary tool for producing inclusive growth. But the research support for this has not been entirely clear. Countries that have expanded their schooling have not necessarily seen the positive economic gains they had hoped for. Similarly the beneficial distributional effects are difficult to document. The central explanation for both appears directly related to measurement issues. When skills are properly measured, many of the issues of growth, development, and distribution become much clearer.

Empirical growth analysis has focused on why some nations have grown faster than others. Propelled by the initial studies of Barro (1991), Romer (1990b), and others, hundreds of subsequent studies searched for the key ingredients of growth. After initial enthusiasm, however, there was growing skepticism about how to interpret cross-sectional growth models. Specifically, many have argued that the existing analyses have not adequately identified the role of human capital and thus that the estimated relationships are heavily influenced by specification issues, by reverse causality, and by mismeasured other elements of country differences.

The argument made here is that most of the prior problems emanate from bad measures of skill differences across countries. When properly measured by the knowledge capital of nations—i.e., the aggregate cognitive skills of the workforce—there is a clear and well-identified impact of skills on growth.

This paper exploits the measured skill differences across countries to estimate robust models of economic growth. It then uses these models to analyze how improvement in the skills of U.S. students/workers would impact on aggregate economic outcomes.

The simple idea behind this is that improving mobility in society and the distribution of income in the United States—issues of considerable current debate—depends importantly on improving the skills of the population. Skills at the bottom end of the distribution are particularly important for economic outcomes, and this paper projects how improving skills at the bottom end of the distribution would affect both individual outcomes and aggregate economic well-being.

Basic Relationship of Knowledge Capital and Economic Growth

The existing empirical analysis of growth is now quite extensive, but this work has not always been convincing or successful, as extracting the fundamental factors underlying growth differences has proven difficult. This paper builds on prior analysis, which appears to resolve the most important uncertainties in understanding long-run growth.[1] Specifically, growth is directly and significantly related to the skills of the population.

The paper concludes that by far the most important determinant of economic growth is the knowledge capital, or the collective cognitive skills, of a country. Virtually all past economic analyses of the long-run growth of countries have highlighted a role for human capital, but the validity and reliability of the empirical analysis has been open to question.[2] There have been concerns introduced by the instability of any estimates, which has been taken as evidence of misspecified relationships where omitted influences of other factors appear likely. Moreover, there is concern about reversal causality; i.e., growth causing schooling rather than the opposite. As laid out in detail in Hanushek and Woessmann (2015a), it appears that these prior concerns can now be satisfactorily answered—once skills are correctly measured—and that the basic growth relationships can support a detailed analysis of the economic implications of improving on a nation's knowledge capital. While the complete analysis of these statistical and modeling issues can be quite complicated, this paper summarizes the analysis and provides appropriate references for those desiring more depth.

Baseline Estimates

Prior theoretical and empirical work has pursued a variety of specifications of the underlying growth process.[3] This paper begins with a very general view and then provides some details of how skills relate to growth. Because the subsequent economic analysis relies heavily on the estimates of growth models, it is useful to have an overview of these.

The basic formulation depicts a country's growth rate as a function of the skills of workers and other factors that include initial levels of income and technology, economic institutions, and other systematic factors. Skills are frequently referred to simply as the workers' human capital stock.

1 Hanushek and Woessmann (2015a).

2 Pritchett (2006).

3 See the reviews in Hanushek and Woessmann (2008; 2010).

$$growth = \alpha_1 human\ capital + \alpha_2 other\ factors + \varepsilon \quad (1)$$

This formulation suggests that nations with more human capital tend to continue to make greater productivity gains than nations with less human capital, although the possibility that the induced growth in productivity disappears over time is considered subsequently.[4]

The empirical macroeconomic literature focusing on cross-country differences in economic growth has overwhelmingly employed measures related to school attainment, or years of schooling, to test the human capital aspects of growth models. While it has tended to find a significant positive association between quantitative measures of schooling and economic growth, these formulations introduce substantial bias into the picture of economic growth.[5] Average years of schooling is a particularly incomplete and potentially misleading measure of education for comparing the impacts of human capital on the economies of different countries. It implicitly assumes that a year of schooling delivers the same increase in knowledge and skills regardless of the education system. For example, a year of schooling in Brazil is assumed to create the same increase in productive human capital as a year of schooling in Korea. Additionally, formulations relying on this measure assume that formal schooling is the only source of education and that variations in non-school factors have negligible effects on education outcomes and skills. This neglect of cross-country differences in the quality of schools and in the strength of family, health, and other influences is probably the major drawback of such a quantitative measure of schooling.

4 A major difference of perspective in modeling economic growth is whether education should be thought of as an input to overall production, affecting the level of income in a country but not the growth rate in the long run (augmented neoclassical models as in Mankiw, Romer, and Weil (1992)) or whether education directly affects the long-run growth rate (endogenous growth models as, importantly, in Lucas (1988), Romer (1990a), and Aghion and Howitt (1998)). See Acemoglu (2009), Aghion and Howitt (2009), Barro and Sala-i-Martin (2004), and Jones and Vollrath (2013) for textbook introductions. In terms of these major theoretical distinctions, the formulations combine key elements of both competing models. The fact that the rate of technological change and productivity improvement is directly related to the stock of human capital of the nation makes it an endogenous growth model. At the same time, by including the initial level of income among the control variables, this model does allow for conditional convergence, a leading feature of the augmented neoclassical approach. These alternatives are discussed in the projections of economic outcomes.

5 To give an idea of the robustness of this association, an extensive empirical analysis by Sala-i-Martin, Doppelhofer, and Miller (2004) of 67 explanatory variables in growth regressions on a sample of 88 countries found that primary schooling was the most robust influence factor (after an East Asian dummy) on growth in GDP per capita in 1960–96.

To see this, consider a standard version of an education production function as employed in a very extensive literature,[6] where skills are expressed as a function of a range of factors:

$$human\ capital = \beta_1 schools + \beta_2 families + \beta_3 ability + \beta_4 health + \beta_5 other\ factors + \upsilon \quad (2)$$

In general, human capital combines both school attainment and its quality with the other relevant factors including education in the family, labor market experience, health, and so forth.

Thus, while school attainment has been convenient in empirical work because of its ready availability across countries, its use ignores differences in school quality in addition to other important determinants of people's skills. A more satisfying alternative is to incorporate variations in cognitive skills, which can be determined through international assessments of mathematics, science, and reading achievement as a direct measure of the human capital input into empirical analyses of economic growth.

The focus on cognitive skills has a number of potential advantages:

1. It captures variations in the knowledge and ability that schools strive to produce and thus relates the putative outputs of schooling to subsequent economic success.

2. By emphasizing total outcomes of education, it incorporates skills from any source—including schools, families, and ability.

3. By allowing for differences in performance among students with differing quality of schooling (but possibly the same quantity of schooling), it opens the investigation of the importance of different policies designed to affect the quality aspects of schools.

4. It is practical because of the extensive development of consistent and reliable cross-country assessments.

The growth analysis here relies on the measures of cognitive skills developed in Hanushek and Woessmann (2015a). Between 1964 and 2003, 12 different international tests of math, science, or reading were administered to a voluntarily participating group of countries.[7] These include 36 different possible scores for year-age-test combinations (e.g., science for students of grade 8 in 1972 as part of the First International Science Study or math of

6 See Hanushek (1986, 2002) for reviews.

7 See Hanushek and Woessmann (2011a) for a review of international testing. Note that there have been five major international assessments since 2003. This paper emphasizes the early assessments because they fit into the analysis of long-run growth. In the analysis of economic impacts for countries, this paper relies on the subsequent testing.

15-year-olds in 2000 as a part of the first Program for International Student Assessment (PISA) test). The assessments are designed to identify a common set of expected skills, which were then tested in the local language. Each test is newly constructed, until recently, with no effort to link to any of the other tests. Hanushek and Woessmann (2015a) describe the construction of consistent measures at the national level across countries through empirical calibration of the different tests.[8] These measures of knowledge capital for nations rely on the average (standardized) test scores for each country's historical participation in the tests. The aggregate scores are scaled (like PISA today) to have a mean of 500 and a standard deviation at the individual level of 100 across Organisation for Economic Cooperation and Development (OECD) countries.

This paper interprets the test scores as an index of the human capital of the populations (and workforce) of each country. This interpretation of the averages over different cohorts is reasonable if a country's scores have been stable across time, implying that estimates from recent school-aged populations provide an estimate of the older working population. If scores (and skills) do in fact change over time, some measurement error is clearly introduced. The scores have changed some, but within the period of observations differences in levels across countries dominate any intertemporal score changes.[9]

By using the aggregate test scores for each country—its knowledge capital—as a more refined measure of human capital, it is possible to estimate equation (1) directly.[10] Table 1 presents the basic results on the association between educational outcomes and long-run economic growth in the sample of 50 countries for which there have been both economic growth data and

8 By transforming the means and variances of the original country scores (partly based on external longitudinal test score information available for the United States), each is placed into a common distribution of outcomes. Each age group and subject is normalized to the PISA standard of mean 500 and individual standard deviation of 100 across OECD countries, and then all available test scores are averaged at the country level.

9 For the 50 countries in the growth analysis, 73 percent of the variance in scores lies between countries (Hanushek and Woessmann (2012a)). The remaining 27 percent includes both true score changes and any measurement error in the tests. Any measurement error in this case will tend to bias downward the estimates of the impact of cognitive skills on growth, so that our estimates of economic implications will be conservative.

10 The data on GDP per capita and its growth for this analyses come from the Penn World Tables (Heston, Summers, and Aten (2002)). Data on quantitative educational attainment are an extended version of the Cohen and Soto (2007) data. Results are very similar when using the latest Barro and Lee (2013) data on educational attainment; see Hanushek and Woessmann (2015a), appendix 3A.

Table 1: Basic growth regressions, long-run growth in per capita GDP 1960–2000

	(1)	(2)	(3)
Cognitive skills		2.015***	1.980***
		(10.68)	(9.12)
Initial years of schooling (1960)	0.369***		0.026
	(3.23)		(0.34)
Initial GDP per capita (1960)	-0.379***	-0.287***	-0.302***
	(4.24)	(9.15)	(5.54)
Constant	2.785***	-4.827***	-4.737***
	(7.41)	(6.00)	(5.54)
R2 (adj.)	0.25	0.73	0.733

Note: Dependent variable: average annual growth rate in GDP per capita, 1960 to 2000. Cognitive skill measure refers to average score on all international tests 1964 to 2003 in math and science, primary through end of secondary school. Absolute value of t-Statistics in parentheses: statistical significance at *** 1 percent.
Source: Hanushek and Woessmann (2015).

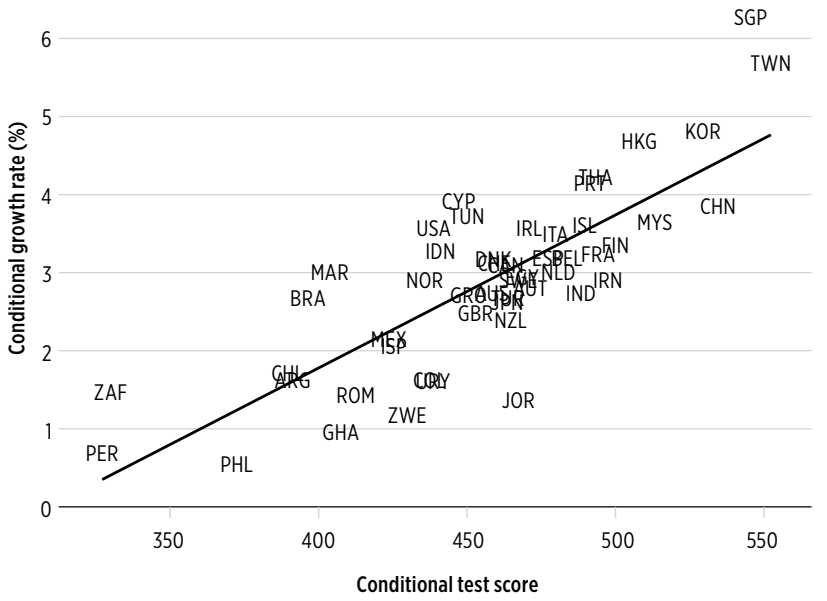
the measure of knowledge capital.[11] The inclusion of initial gross domestic product (GDP) per capita in all specifications simply reflects the fact that it is easier to grow when farther from the technology frontier, because it is only necessary to imitate others rather than invent new things.

When knowledge capital is ignored (column 1), years of schooling in 1960 are significantly associated with average annual growth rates in real GDP per capita in 1960–2000.[12] However, once the test measure of knowledge capital is included (columns 2 and 3), cognitive skills are highly significant while years of schooling become statistically insignificant and the estimated coefficient drops to close to zero. Furthermore, the variation in cross-country growth explained by the model increases from 25 percent to 73 percent when measuring human capital by cognitive skills rather than years of schooling. Note that the bivariate association with initial per-capita GDP already accounts for 7 percent of the variance in subsequent growth, making the relative increase in understanding

11 See Hanushek and Woessmann (2012a; 2015a) for a more complete description of both the data and the estimation, which extends previous work by Hanushek and Kimko (2000).

12 To avoid the 2008 global recession, its aftermath, and any potential bubbles building up beforehand, the growth analysis stops in 2000, but results are very similar when extending the growth period to 2007 or 2009; see Hanushek and Woessmann (2015a), appendix 3A.

Figure 1: Knowledge capital and economic growth rates across countries



Note: Added-variable plot of a regression of the average annual rate of growth (in percent) of real GDP per capita in 1960–2000 on average test scores on international student achievement tests, average years of schooling in 1960, and initial level of real GDP per capita in 1960 (mean of unconditional variables added to each axis).
Source: Hanushek and Woessmann (2015a).

growth through cognitive skills as opposed to just the natural convergence of growth from less developed to more developed countries remarkable.

The estimated coefficient on cognitive skills implies that an increase of one standard deviation in educational achievement (i.e., 100 test-score points on the PISA scale) yields an average annual growth rate over 40 years of observation that is two percentage points higher. This historical experience suggests a very powerful response to improvements in educational outcomes, particularly when compared to the average 2.3 percent annual growth within the sampled countries over the past two decades.

Perhaps the easiest way to see the relationship is to plot the marginal impact of knowledge capital on long-run growth. Figure 1 depicts the fundamental association graphically, plotting growth in real per-capita GDP between 1960

and 2000 against average test scores after allowing for differences in initial GDP per capita and initial average years of schooling. Countries align closely along the regression line that depicts the positive association between cognitive skills and economic growth.

This basic relationship underlies the subsequent consideration of what skill improvement would mean for the U.S. economy. Before going to that, however, it is useful to consider the plausibility of using these estimates as the basis of projections into the future.

Causality in Brief

The fundamental question is: should this tight relationship between cognitive skills and economic growth be interpreted as a causal one that can support direct policy actions?[13] In other words, if achievement were raised, would growth rates really be expected to go up by a commensurate amount?

Work on differences in growth among countries, while extensive over the past two decades, has been plagued by legitimate questions about whether any truly causal effects have been identified, or whether the estimated statistical analyses simply pick up a correlation that emerges for other reasons.

Knowing that the relationship is causal, and not simply a byproduct of some other factors, is very important from a policy standpoint. It is essential to be confident that, if a country managed to improve its achievement in some manner, it would see a corresponding improvement in its long-run growth rate. Said differently, if the relationship between test scores and growth rates simply reflects other factors that are correlated with both test scores and growth rates, a change in test scores may have little or no impact on the economy.

The early studies that found positive effects of years of schooling on economic growth may have, indeed, been suffering from what is known as reverse causality, that is, improved growth was leading to more schooling rather than the reverse.[14] If a country gets richer, it tends to buy more of many things, including more years of schooling for its population.

There is less reason to think that higher student achievement is caused by economic growth. For one thing, scholars have found little impact of additional education spending on achievement outcomes, so it is unlikely that the relationship comes from growth-induced resources lifting student achievement.[15] Still, it remains difficult to develop conclusive tests of causality with the limited sample of countries included in this analysis.

13 This section summarizes the detailed analysis found in Hanushek and Woessmann (2012a; 2015a).

14 See, for example, Bils and Klenow (2000).

15 See the review in Hanushek and Woessmann (2011a).

The best course is to consider alternative explanations to determine whether it is possible to rule out major factors that could confound the results and lead to incorrect conclusions about causal relationships. Although no single approach can address all of the important issues, a combination of approaches, if it provides support for a causal relationship between achievement and growth, offers some assurance that the issues most likely to be problematic are not affecting the results. Investigations into the potential problems with the prior estimation and their likely severity are summarized here. These have been more fully reported elsewhere.[16]

First, the estimated relationship is little affected by including other possible determinants of economic growth. An extensive investigation of alternative model specifications employs different measures of cognitive skills, various groupings of countries (including some that eliminate regional differences), and specific sub-periods of economic growth. These efforts show a consistency in the alternative estimates, in both quantitative impacts and statistical significance, that is uncommon in cross-country growth modeling. Moreover, measures of geographical location, political stability, capital stock, and population growth do not significantly affect the estimated impact of cognitive skills. These specification tests rule out some basic problems attributable to omitted causal factors that have been noted in prior growth work. Of course, there are other possible omitted factors, leading to further examination of the details of international differences.

Second, the most obvious reverse-causality issues arise because the analysis relates growth rates over the period 1960 to 2000 to test scores for roughly the same period. To address this directly, the timing of the analysis is separated by estimating the effect of scores on tests conducted only until 1984 on economic growth in the period since 1985 (and until 2009). In this analysis, available for a sample of 25 countries only, test scores strictly pre-date the growth period, making it clear that increased growth could not be causing the higher test scores of the prior period. This estimation shows a positive effect of early test scores on subsequent growth rates that is almost twice as large as that displayed in figure 1. Indeed, this fact itself may be significant, because it is consistent with the possibility that skills have become even more important for the economy in recent periods.

Third, even if reverse causality were not an issue, it does ensure that the important international differences in test scores reflect school policies. After all, achievement may arise because of health and nutrition differences in the population or simply because of cultural differences regarding learning and testing. Nevertheless, attention can be focused just on variations

16 See the extended discussion in Hanushek and Woessmann (2015a).

in achievement that arise directly from institutional characteristics of each country's school system (exit examinations, autonomy, relative teacher salaries, and private schooling).[17] This estimation of the growth relationship yields essentially the same results as previously presented, lending support both to the causal interpretation of the effect of cognitive skills and to the conclusion that schooling policies can have direct economic returns. Nonetheless, countries that have good economic institutions may have good schooling institutions, so that this approach, while guarding against simple reverse causality, cannot eliminate a variety of issues related to omitted factors in the growth regressions.

Fourth, a major concern is that countries with good economies also have good school systems, implying that those that grow faster because of the basic economic factors also have high achievement. In this case, achievement is simply a reflection of other important aspects of the economy and not the driving force in growth. One simple approach is to consider the implications of differences in measured skills within a single economy, thus eliminating institutional or cultural factors that may make the economies of different countries grow faster. This can readily be done for immigrants to the United States who have been educated in their home countries and who can be compared to those immigrants educated just in the United States. Since the two groups are within the single labor market of the United States, any differences in labor-market returns associated with cognitive skills cannot arise because of differences in the economy or culture of their home country. Looking at labor-market returns, immigrants from countries with higher cognitive skills tend to have higher incomes, but only if the immigrant was in fact educated in the home country. Immigrants from the same home country schooled in the United States see no economic return to home-country test scores, thus pinpointing the value of better schools. These results hold when Mexicans (the largest U.S. immigrant group) are excluded and when only immigrants from English-speaking countries are included. While not free from problems, this comparative analysis rules out the possibility that test scores simply reflect cultural factors or economic institutions of the home country. It also lends further support to the potential role of schools in changing the cognitive skills of citizens in economically meaningful ways.

Finally, for those countries that have participated in testing at different points over the past half century, it can be observed whether or not students are getting better or worse over time. Building on this, perhaps the toughest test of causality is relating *changes* in test scores over time to *changes* in growth

17 The formal approach is called "instrumental variables." In order for this to be a valid approach, it must be the case that the schooling institutions are not themselves related to differences in growth beyond their relation with test scores. For a fuller discussion, see Hanushek and Woessmann (2012a).

rates. If test-score improvements actually increase growth rates, it should show up in such a relationship. This approach implicitly eliminates country-specific economic and cultural factors because it looks at what happens over time within each country. The magnitude of trends in educational performance can be related to the magnitude of trends in growth rates over time for 12 OECD countries.[18] This investigation provides more evidence of the causal influence of cognitive skills (although the small number of countries is obviously problematic). The gains in test scores over time are very closely related to the gains in growth rates over time.[19] As with the other approaches, this analysis must presume that the pattern of achievement changes has been occurring over a long time, because it is not the achievement of school children but the skills of workers that count. Nonetheless, the consistency of the patterns and the similarity in magnitude of the estimates to the basic growth models are striking.

Again, each approach to determining causation is subject to its own uncertainty. Nonetheless, the combined evidence consistently points to the conclusion that differences in cognitive skills lead to significant differences in economic growth. Moreover, even if issues related to omitted factors or reverse causation remain, it seems very unlikely that these cause *all* of the estimated effects.

Since the causality tests concentrate on the impact of schools, the evidence suggests that school policy can, if effective in raising cognitive skills, be an important force in economic development. While other factors—culture, health, and so forth—may affect the level of cognitive skills in an economy, schools clearly contribute to the development of human capital. More years of schooling in a system that is not well designed to enhance learning, however, will have little effect.

Bad Economic Institutions

There has been an increasing emphasis on the role of economic institutions as the fundamental cause of differences in economic development. But also, for a decade, the roles of societal institutions and of human capital have

18 Only 12 OECD countries have participated in international tests over a long enough period to provide the possibility of looking at trends in test performance over more than 30 years. The analysis simply considers a bivariate regression of test scores on time for countries with multiple observations. The trends in growth rates are determined in a similar manner: Annual growth rates are regressed on a time trend. The analysis relates the slopes in the test regression to the slopes in the growth rate regression. Hanushek and Woessmann (2012a) consider more complicated statistical relationships, but the overall results hold. They also hold when the sample of countries is expanded to include the non-OECD countries.

19 It is very unlikely that the changes in growth rates suffer the same reverse causality concerns suggested previously, because a change in growth rate can occur at varying income levels and varying rates of growth.

been much debated in discussions of economic growth and development.[20] In extensions to the analysis here, it is possible to consider how attention to various economic institutions affects the picture of the pattern of growth across nations.

This analysis is not designed to resolve either the debate about the predominance of institutions or other related debates about precise measurement of institutions. Societal institutions are almost certainly a component of differences in economic growth, and it is important to understand how they interact with the knowledge capital of nations. The concerns at this point again relate to the measurement of human capital in these prior analyses. All of the prior investigations of the interaction between institutions and human capital across countries are analyzed in terms of school attainment, something that the previous analysis demonstrated to be a very incomplete measure of the relevant skills of nations.

Estimation of how growth is affected by institutions is addressed elsewhere and just the results and implications are summarized here.[21] Specifically, alternative measures of economic institutions are considered within the context of the basic growth models in this essay. The approach is simply to add two common (and powerful) institutional measures related to the quality of the underlying economic environment to the baseline models: openness of the economy and security of property rights.[22] These measures are jointly significant in explaining growth, and the property-rights measure is individually significant.[23] At the same time, though, the results show that cognitive skills continue to exert a positive and highly significant effect on economic growth independent of these

20 In one influential line of research, Acemoglu, Johnson, and Robinson (2001; 2005) have argued that major societal institutions created the fundamental building blocks for modern development (see also Acemoglu, Gallego, and Robinson (2014)). They particularly fixed on the central notion of strong property rights, arguing that the causal role of these institutions could be seen analytically by tracing back to the different colonial paths of countries. On the other hand, Glaeser et al. (2004) have argued that the colonists brought human capital in addition to knowledge of good societal institutions and that it is more likely that better human capital led both to the development of good institutions and higher economic growth.

21 Hanushek and Woessmann (2015a).

22 The measure of openness is the Sachs and Warner (1995) index reflecting the fraction of years between 1960 and 1998 that a country was classified as having an economy open to international trade, based on five factors including tariffs, quotas, exchange rate controls, export controls, and whether or not a socialist economy. Following Acemoglu, Johnson, and Robinson (2001), the measure of security of property rights is an index of the protection against expropriation risk, averaged over 1985–95, from Political Risk Services, a private company that assesses the risk that investments will be expropriated in different countries. Note that data limitations reduce the sample from 50 countries to 47.

23 Note that protection against expropriation and openness are strongly correlated, with a simple correlation of 0.71.

measures of the quality of institutions, albeit the estimated impact of cognitive skills is reduced by a third on average.

The overall interpretation in this context must be nuanced, since the developed nations almost uniformly show no variation in either property rights or openness to international trade. This suggests that developing countries (with restrictive institutions) have room for improving their economic performance by moving toward better institutions. But once they have in fact corrected the imperfect economic institutions, they too must return to relying on knowledge capital for any further improvements in growth.

Importantly, while these macro institutions cannot explain variations in growth among the developed countries, knowledge capital can. Within the OECD, the wide variation in long-run growth rates are very closely related to cognitive skills, and the growth coefficient estimated for just OECD countries is very close to that presented in table 1.[24] Thus, there is clear support for using the previous growth models to project the impact of improvements in achievement in the United States.

What Improved Achievement Means for the United States

The main thrust of this paper is showing the impact that improved student achievement would have on the long-run operations of the U.S. economy and on the distribution of economic wellbeing. The growth models provide a clear means of projecting the aggregate economic implications of improvements in schooling. The next section looks at the direct impact on individual earnings.

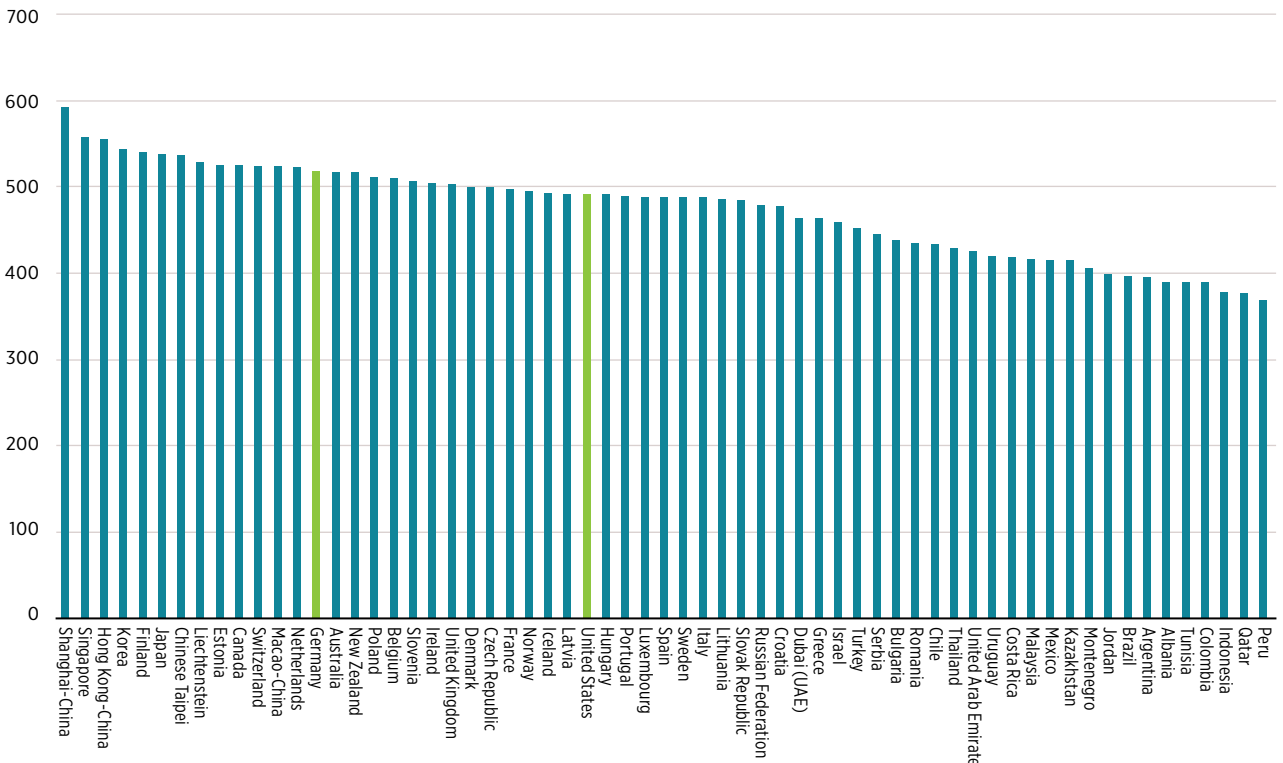
To set the stage, it is useful to consider where the United States falls in terms the world achievement distribution. Figure 2 shows the rankings of countries on the combined mathematics and science scores of PISA for 2009 and 2012.[25] The United States was 30th in the world, tied with Latvia and behind a range of countries that the United States generally does not view itself as competing with. The figure identifies the position of the United States along with the position of Germany, which is discussed subsequently.

The valuation of the economic impact of improved achievement explicitly recognizes the dynamics of schools and of the economy. In particular, time is allowed to improve student achievement and time to have students enter the labor market. The previous growth models are then employed to analyze how

24 Hanushek and Woessmann (2011b).

25 A more complete analysis of the U.S. scores along with the rankings of individual U.S. states can be found in Hanushek, Peterson, and Woessmann (2013).

Figure 2. PISA mathematics plus science: 2009 and 2012



Source: Author calculations. See **https://en.wikipedia.org/wiki/Programme_for_International_Student_Assessment**.

different the economy having workers with higher skills would be compared to one with workers of current skills.

Two improvements in student performance are considered. In the first, the United States raises its achievement to that of Germany. In the second, all students with insufficient skills are brought up to at least to a basic skill level, which is essential as an international analog to No Child Left Behind goals of all students reaching proficiency levels.[26]

Projection Model and Parameter Choices

The projections rely on a simple description of how skills enter the labor market and have an impact on the economy.[27] Achievement goals of U.S. students framed as the standard that should be met by 2030 are considered, leading to the assumption that improvement occurs linearly from today's schooling situation to reaching the goal in 15 years. But of course the labor force itself will only become more skilled as increasing numbers of new, better trained people enter the labor market and replace the less skilled who retire. Assuming that a worker remains in the labor force for 40 years implies that the labor force will not be made up of fully skilled workers for 55 years (15 years of reform and 40 years of replacement of retiring, less-skilled workers).

The growth rate of the economy (according to the estimate of 1.98 percent higher annual growth rate per standard deviation in educational achievement in column 3, table 1) is calculated each year into the future based on the average skill of workers (which changes as new, more skilled workers enter). The difference in GDP is then estimated with an improved workforce versus the existing workforce skills beginning in 2015 until 2095.[28] The projection for 80 years is meant to correspond to the life expectancy of somebody born in 2015.

Future gains in GDP are discounted from the present with a 3 percent discount rate. The resulting present value of additions to GDP is thus directly comparable to the current levels of GDP. The gains can also be compared to the discounted value of projected future GDP without reform to arrive at the average increase in GDP over the 80 years.

26 The federal accountability statute, the No Child Left Behind Act, was replaced in 2015 by the Every Child Succeeds Act, which also has performance goals. The operational implementation of the new accountability statute is, however, not entirely clear.

27 The details of the projection methodology, in somewhat different circumstances, can be found in Hanushek and Woessmann 2010; 2011b; 2015a, where we focused on different policy scenarios (that do not take non-universal enrollment into account) just for OECD countries. Hanushek and Woessmann (2012b) provided projections for European Union countries.

28 The growth of the economy with the current level of skills is projected to be 1.5 percent, or the rough average of OECD growth over the past two decades.

Two Improvements of U.S. Achievement

The implications of two very straightforward policies are considered. The first looks at the long-run implications of increasing average U.S. achievement by 25 PISA points by 2030. In the second, all students are brought up to at least a level of basic skills—a level required to fully participate in today's internationally competitive world.

Table 2 displays what, according to the historical growth relationships, the outcomes of improving the school would be. Bringing U.S. students up by 25 points—almost exactly to the current levels of German students—would have a present value of $62 trillion, or some 3.4 times the value of current U.S. GDP. This increase corresponds to a GDP that is on average for the next 80 years over 7 percent above the no-change levels of GDP. Much of this gain comes in the future, with GDP in 2095 being 30 percent higher—but all of the calculations consider present values and weigh long future gains less than immediate gains.

The second row of the table considers bringing all U.S. students to a basic level of skills.[29] This is defined using the OECD categories of skills of youth at age 15, or roughly the ninth year of schooling. It is assumed that fully achieving Level 1 skills represents the basic skills necessary in order to participate productively in modern economies. The border line between Levels 1 and 2 is 420 points on the PISA mathematics scale.[30] With the mean of 500 and standard deviation of 100 for the OECD countries, this implies performance at the 23rd percentile of the overall OECD distribution. The U.S. average in math for 2012 was only slightly under the OECD average, leaving 23.5 percent of U.S. 15-year-olds without basic skills.

The designation of levels of performance correspond to distinct skills of individuals (OECD (2013b)). The descriptions of this performance (for math) are:

At Level 1, students can answer questions involving familiar contexts where all relevant information is present and the questions are clearly defined. They are able to identify information and to carry out routine procedures according to direct instructions in explicit situations. They can perform actions that are almost always obvious and follow immediately from the given stimuli.

These skills are generally referred to by the OECD as those that are necessary for further learning. Examples of the kinds of questions that mark this level are found in Hanushek and Woessmann (2015b).

29 The development of the idea of minimal skills relates directly to our analysis of alternative development goals for world economies. Added details can be found in Hanushek and Woessmann (2015b).

30 Note that the border between levels 1 and 2 in science is slightly lower at 407 points (OECD (2013b)). Nonetheless, 420 PISA points are used for both science and math.

The impact of raising the bottom quarter of the distribution up to a basic level would be to increase the average U.S. PISA score by 11.7 points.[31] This would yield a present value of $28 trillion, or some 1.5 times the value of the current GDP.

Endogenous versus Neoclassical Growth

One of the enduring debates in growth literature is how skills affect the long-run development of the economy. At the risk of over simplifying, one view is that added skills of a society (knowledge capital) leads to enhanced innovation and can support a higher growth rate in the future. The other view is that expanded education and skills enter into economic outcomes just as capital and raw labor do.[32] While it is not possible to distinguish between these views empirically, it is possible to estimate how much difference adopting one or the other would mean for future economic outcomes.

With a small modification in basic growth models, it is possible to estimate models consistent with neoclassical growth.[33] When this is done, the impact of differences in knowledge capital is not measurably affected, but the growth path is different. Table 3 shows a direct comparison. Indeed, the present value of improved schooling is lowered when schooling no longer has an impact on the rate of productivity improvement (as in the endogenous growth version). Nonetheless, the long-run impact on economic wellbeing remains large and important.

Direct Distributional Issues

Economic growth does not, however, imply that all in society gain. It is possible to have economic gains that do not in particular bring up the bottom of the distribution.

This section begins with a discussion of how changing the skill distribution affects the income distribution. It then considers a broader issue of whether focusing on basic skills is better than focusing on just the people with the highest level of skills.

31 For these calculations, we look at the scores that would be required to bring everybody with a score below 420 up to 420, and we assume that no other students were affected.

32 In empirical application, the endogenous growth view indicates that growth rates should be related to the level of human capital. The neoclassical view is that growth rates are related to the change in human capital.

33 Empirically this amounts to estimated models with the log of initial GDP instead of the level of GDP. See Hanushek and Woessmann (2015a).

Table 2. Economic benefits from improved school

SCHOOL IMPROVEMENT BY 2030	PRESENT VALUE ($BN)	PRESENT VALUE COMPARED TO:		GDP IN 2905 COMPARED TO NO REFORM	LONG-RUN GROWTH INCREASE	INCREASE IN PISA SCORES
		CURRENT GDP	DISCOUNTED FUTURE GDP			
25 point improvement	62,120	340%	7.3%	30%	0.5	25
Universal minimal skills	27,929	153%	3.3%	13%	0.23	11.7

Source: Hanushek and Woessmann (2015b).

Skill Variance and Income Variance

In any country, many things enter into the distribution of income that is observed. The character of the labor market, the taxes of the government, the level of welfare and social security programs, and the returns to investments all enter into the distribution of income. But in a modern competitive economy, a fundamental factor in the determination of incomes is the productivity of individuals that will be rewarded in the labor market. Analyzing the full distribution of income is clearly beyond this discussion, but it is possible to use the prior data on the skill distributions to understand how the distribution of productivity and individual earnings might change with obtaining the basic skills goal.

The simple idea is that the distribution of skills is an important ingredient in the distribution of productivity in modern economies, and in competitive economies the distribution of productivity directly affects the earnings of workers. The distribution of labor earnings in turn enters significantly into the distribution of income in society. From existing analysis, it is possible to consider how the earnings distribution would change if all society members have basic skills, as indicated by the previous policy objective of ensuring that all youth have basic skills.

The most direct way to see the impact comes from information about the rewards to skills in the labor market. Information on the labor market earnings is directly available for a number of OECD economies. In its Programme for the International Assessment of Adult Competencies (PIAAC), the OECD sampled a random selection of adults in 24 separate countries in 2011–12 and gave them a series of tests covering cognitive skills in three domains: literacy, numeracy, and problem solving in technology-rich environments. The tasks respondents had to solve were often framed as real-world problems, such as maintaining a driver's logbook (numeracy domain) or reserving a meeting room on a particular date using a reservation system (problem-solving

Table 3. Economic benefits from improved school by alternative projection models

SCHOOL IMPROVEMENT BY 2030	ENDOGENOUS GROWTH			NEOCLASSICAL GROWTH		
	PRESENT VALUE ($BN)	PRESENT VALUE COMPARED TO:		PRESENT VALUE ($BN)	PRESENT VALUE COMPARED TO:	
		CURRENT GDP	DISCOUNTED FUTURE GDP		CURRENT GDP	DISCOUNTED FUTURE GDP
25 point improvement	62,120	340%	7.3%	45,048	246%	5.9%
Universal minimal skills	27,929	153%	3.3%	15,419	84%	2.0%

Source: Hanushek and Woessmann (2015b).

domain). The domains, described more completely in OECD (2013a), refer to key information-processing competencies that are demanded in modern economies.

Using the PIAAC data, it is possible to estimate how different skills affect individual earnings in different countries. It turns out that there is considerable variation across countries.[34] The largest return to skills is, however, found in the United States. The U.S. labor market data indicate that one standard deviation of mathematics achievement yields on average 28 percent higher earnings each and every year of a career.[35] In other words, somebody at the 84th percentile of the mathematics distribution would earn 28 percent more than an average person over the work life. Similarly, and important for this analysis, somebody at the 16th percentile of the mathematics distribution would earn 28 percent less than an average person.

Viewing the changes arising from reaching the goal of universal basic skills in earnings terms allows for estimation of the achievement-induced changes in the earnings distribution. The increase in average earnings from reaching basic skills amounts to some 3.3 percent for the United States.[36] Importantly, this is accompanied by a 4.5 percent average reduction in the standard deviation of earnings.[37]

34 See the analysis in Hanushek et al. (2015).

35 The analysis of the PIAAC data indicates a wide range of returns to math skills—from 28 percent in the United States to 12 percent in Sweden.

36 The earnings gains come from relating the change in skills to earnings through the estimated U.S. earnings parameter of 28 percent per standard deviation.

37 In calculating the standard deviation of the post-reform distribution, we assign a score of 420 to everybody previously below this level. In reality, instead of all of the people stacked at 420, there would almost certainly be a distribution of scores with a portion of the affected distribution scoring above 420. This would produce an even larger reduction in the standard deviation than calculated here.

This analysis points to the fact that achieving the goal of universal basic skills has a complementary impact on reducing gaps in earnings that will filter into income differences in the societies. But it does so while also expanding the size of the economy, as opposed to any simple tax and redistribution scheme that might change the ultimate distribution of income but would not add to societal output. For this reason, knowledge capital policies are desirable in terms of inclusion and achieving a more equitable income distribution.

Basic Skills for All vs. Top Achievers

One aspect of the previous calculations is quite artificial. The policies that affect only those youth who would obtain less than basic skills are analyzed as if all others were unaffected, and this surely is a very improbable outcome from any school policy. Thus, in this regard the policy scenarios would represent lower bounds on the achievement and economic impacts of policies designed to ensure that all youth reach at least 420 points on the achievement scale, or at least basic skills.

A second part about the wider performance distribution also deserves attention. Many countries are torn between providing basic skills and cultivating the very highest achievers. Visually different countries make varying choices about where to focus the attention of their educational systems.[38]

The impact on economic growth of greater proportions of superior achievers compared to that of basic skills as seen here has been considered in Hanushek and Woessmann (2015a). Instead of relying on just mean skills, that analysis incorporates the share of top achievers (greater than 600 point) and the share of bottom achievers (400 points in that analysis) into the growth modeling. It turns out that both ends of the distribution of a nation's cognitive skills are significantly related to economic growth, either when entered individually or jointly.[39] Both the basic-skill and the top-performing dimensions of educational performance appear separately important for growth. A 10 percentage point increase in the share of students reaching basic literacy is associated with 0.3 percentage points higher annual growth, and a 10 percentage point increase in the share of top-performing students is associated with 1.3 percentage points higher annual growth.

It is difficult to compare directly the impacts of the two performance measures. For example, it may be much more feasible to increase the basic-literacy share than to increase the top-performing share by the same amount,

38 See the depictions of distributions of cognitive skills across countries in Hanushek and Woessmann (2015a).

39 In the joint model, the two measures are separately significant even though they are highly correlated across countries with a simple correlation of 0.73.

as suggested by the fact that the international standard deviations of these two shares are 0.215 and 0.054, respectively. Thus, increasing each share by roughly half a standard deviation (10 percentage points basic-literacy share and 2.5 percentage points top-performing share) yields a similar growth effect of roughly 0.3 percentage points.

The impact of the basic skills share does not vary significantly with the initial level of development, but the impact of the top-performing share is significantly larger in countries that have more scope to catch up to the initially most productive countries.[40] This appears to reflect the fact that countries need high-skilled human capital for an imitation strategy, and the process of economic convergence is accelerated in countries with larger shares of high-performing students. Obvious cases are East Asian countries such as Taiwan, Singapore, and Korea that all have particularly large shares of high performers, started from relatively low levels, and have shown outstanding growth performances. By looking at the interaction of the top-performing and basic-literacy shares in growth models, it also appears that there is a complementarity between basic skills and top-level skills: in order to be able to implement the imitation and innovation strategies developed by scientists, countries need a workforce with at least basic skills.

Many countries have focused on either basic skills or engineers and scientists. In terms of growth, the estimates suggest that developing basic skills and highly talented people reinforce each other. Moreover, achieving basic literacy for all may well be a precondition for identifying those who can reach "rocket scientist" status. In other words, tournaments among a large pool of students with basic skills may be an efficient way to obtain a large share of high performers.

Why Has the United States Done so Well?

But is it really all that important to boost student achievement? Does long-term growth in economic productivity within the United States really depend on the quality of the human capital of the next generation? It may be true that economic growth is greater in countries that have higher levels of human capital, as indicated by student achievement, as shown previously. But is the United States not exempt from the human capital law that ties learning and growth together?

The United States has never done well on international assessments of student achievement. Instead, as described, its level of cognitive skills is only about average among the developed countries. Yet the country's GDP growth

40 The larger growth effect of high-level skills in countries farther from the technological frontier is most consistent with technological diffusion models (e.g., Nelson and Phelps 1966).

rate has been higher than average over the past century. If cognitive skills are so important to economic growth, how can the puzzling case of the United States be explained? Indeed, in figure 1, the United States lies above the line—getting faster growth than suggested by its achievement levels.

Part of the answer is that the United States comes from other economic advantages that are quite separate and apart from the quality of its schooling. Overall, the United States has generally less intrusion of government in the operation of the economy, including lower tax rates and minimal government production through nationalized industries. The United States maintains generally freer labor and product markets than most countries in the world, there is less government regulation of firms, and trade unions are less powerful than in many other countries. Additionally, the United States has strong property rights. Taken together, these characteristics of the U.S. economy encourage investment, permit the rapid development of new products and activities by firms, reward individuals for invention, and allow U.S. workers to adjust to new opportunities. These features of the U.S. economy are generally viewed as the best economic institutions in the world, something that many other nations are attempting to copy.

It is also the case that, over the 20th century, the expansion of the U.S. education system outpaced the rest of the world. The United States pushed to open secondary schools to all citizens. Higher education also expanded with the development of land grant universities, the G.I. bill,[41] and direct grants and loans to students. The extraordinary U.S. higher-education system is a powerful engine of technological progress and economic growth in the United States not accounted for in this analysis. By most evaluations, U.S. colleges and universities rank at the very top in the world.

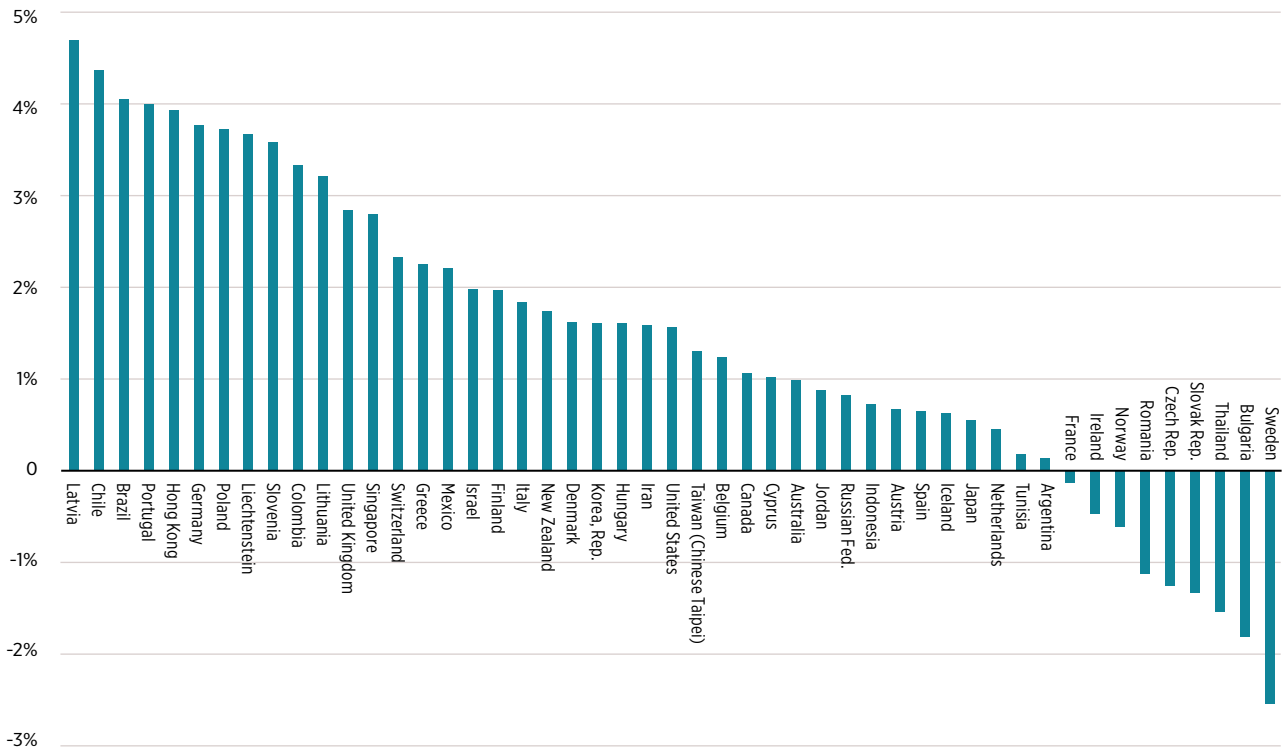
Although the strengths of the U.S. economy and its higher-education system offer continuing hope for the future, the situation at the K–12 level has an obvious impact on the higher-education system as well. The U.S. higher-education system will likely be challenged both by the quality of incoming students and by improvements in higher education across the world.

Other countries are working to secure property rights and open their economies, which will enable them to make better use of their human capital. Most obviously, the historic advantage of the United States in school attainment has come to an end, as half of the OECD countries now exceed the United States in the average number of years of education their citizens receive. Those trends could easily accelerate in the coming decades.

The United States has been able to import skilled immigrants from abroad—immigrants who have better skills than U.S. workers. These immigrants also increasingly populate U.S. colleges and universities and have frequently been

41 Servicemen's Readjustment Act of 1944, Pub. L. No. 78–346, 58 Stat. 284m (1944).

Figure 3: Annual growth in student achievement, 1995–2009



Note: Estimated annual test score change as percent of a standard deviation, based on NAEP, PISA, TIMSS, and PIRLS achievement tests.
Source: Hanushek, Peterson, and Woessmann (2012), Table B.1.

induced to stay in the United States after their post-secondary schooling. However, the ability of the United States to continue with this depends directly both on U.S. immigration policies and its ability to offer better opportunities than other countries. Neither is assured into the future.

In fact, all of the historical advantages over U.S. economic competitors—commitment to universal secondary school attainment; strong and well-developed economic system; secure property rights and free movement of labor and capital; world's best universities; and use of skilled immigrants—are likely to go away as many other countries have made great strides in emulating and even surpassing these strengths of the United States. In the future, the United States will have to rely only on its skills if it is to sustain the current economic standing. In other words, the best projection is that the United States falls back to the growth-achievement line in figure 1, leaving it with the same human capital challenges as other countries.

The advantages of the U.S. economy will not disappear immediately. But that does not mean that it cannot benefit from an improved K–12 schooling system. As demonstrated previously, the gains that could be expected from improvement are striking. Moreover, these projections, which build on the worldwide experience, may understate the potential advantage of greater human capital to the United States, because the value of added skills is made even greater by its strong political and economic institutions.

Conclusions

One thing stands out from this analysis. Skills govern economic outcomes in the long run, and improvements in skills of U.S. society could effectively solve the current fiscal and distributional concerns that are so much in debate today.

This is not the place to consider reform approaches and the many obstacles and arguments against reform proposals.[42] It is useful to point out, however, that reforms of the magnitude considered here are possible. Figure 3 shows the average annual gains in scores on the international tests that have been seen in various countries. Fully 20 countries achieved sufficient gains over the period 1995–2009 to obtain 25 point gains on the tests.[43] Of course this is not easy, as indicated by the fact that a number of countries actually regressed in performance over this period.

This summary perspective is very simple. Both overall economic outcomes and distributional/mobility aspects of these depend crucially on upgrading the skills of U.S. society. ■

42 See the discussion in Hanushek, Peterson, and Woessmann (2013).

43 This figure provides data on score changes for all countries that had participated sufficiently over time.

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How Does Declining Unionism Affect the American Middle Class and Intergenerational Mobility

RICHARD FREEMAN
Harvard University and
National Bureau of Economic Research

EUNICE HAN
Wellesley College and National Bureau of Economic Research

DAVID MADLAND
Center for American Progress

BRENDAN V. DUKE
Center for American Progress

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This paper addresses three ways in which unionism potentially affects workers that the voluminous quantitative literature on "what do unions do" has largely ignored.

The first way relates to the impact of unionism on the size of the middle class. Since unions tend to compress the structure of wages and incomes, and the middle class consists of persons near the middle of the income distribution, it could be expected that union workers would be primarily in the middle-income group and that a decline in union density would contribute to the shrinking middle class size. This issue has not been widely explored because the shrinking American middle class is a recent phenomenon. Most studies of unions and the distribution of wages and salaries use metrics like the Gini coefficient or the variance of the log of earnings rather than the proportion of workers in the middle of the distribution. The first section
of this paper shows that union workers are indeed disproportionately middle class or higher, with some attaining middle-class incomes as a result of the union wage premium, and that the decline of unionism contributes to the shrinking middle class.

The second previously unexplored way in which unions could affect workers is through the intergenerational transmission of economic status. The second section of this paper shows that having a union parent is associated with improved outcomes for children after controlling for parents' education, race, occupation, industry, and other covariates. This could be in part due to the union wage premium raising parental income, in part due to better education and health outcomes associated with having a unionized parent independent of parental income, and in part due to the intergenerational transmission of union status.

The third issue examined is whether the union density of the area in which a young person grows up is associated with their future economic performance. If parental unionization raises the upward mobility of offspring, children from areas with higher union density ought to do better than children from areas with lower union density. To the extent that unions press for better schooling and social amenities in an area, the union impact should spill over from union to non-union families, producing a residence-based impact beyond the union status of individuals. It could also serve as verification that any potential positive effects of unions on children do not reflect a

redistribution of opportunity from non-union to union children. The third section of this paper finds that, regardless of the union status of their parents, offspring from communities with higher union density have higher average incomes relative to their parents than offspring from communities with lower union density.

While these findings are not necessarily causal, the relationship between unionism, the middle class, and inequality found in this and other studies raises the question of whether the United States will be able to reduce income equality and rebuild a strong middle class absent a vibrant trade union movement or other comparable institutions for workers.

Unionism and Middle-Class Status

Following Krueger's (2012) analysis with the Center for Economics Policy Research's Current Population Survey (CPS) of March, middle class is defined as the population aged 25–64 earning an income between 0.5 and 1.5 times the median income level—the portion of the population within 50 percent of the median income. Figure 1 shows that the size of the middle class has fallen by more than 10 percentage points from 56.5 percent in 1979 to 45.1 percent in 2012. During the same period, the unionization of American workers declined by 13 percentage points, from 24 percent to 11 percent.[1]

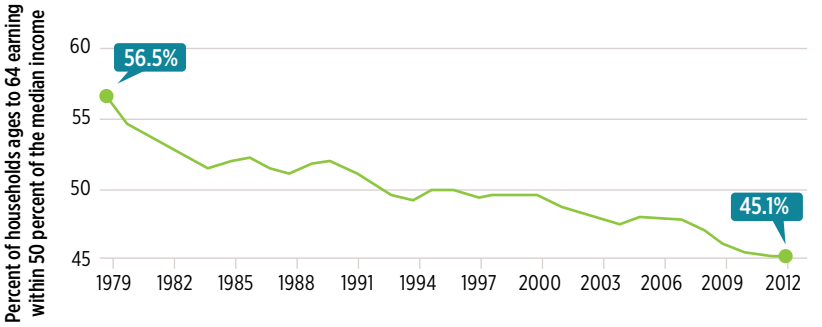
The Panel Study of Income Dynamics (PSID), which contains information on the incomes and union status of parents and of their adult offspring, is used to examine the relationship between unionism and middle-class status among parents and offspring. It displays a similar decline in the middle-income group to that in the CPS.

Table 1 summarizes the pattern of unionization and the proportion of workers in the middle-income group for parents and their children in the PSID data set. The status of parents in 1985 is contrasted with the status of their adult offspring in 2011. If heads of household aged 25 to 64 have a family income between 50 percent and 150 percent of the median income, they are categorized as middle class and referred to as the "middle-income group." The table also shows a drop in unionization of 8 percentage points (19.07 percent–10.90 percent) from parents to their offspring and a drop in the proportion of workers in the middle-income group by 8 percentage points (54.04 percent–46.01 percent) between parents and their adult children.

Are these changes connected? One way to estimate the contribution of the drop in unionization to the drop in the proportion of persons in the

1 See Hirsch and Macpherson 2003 for all wage and salary workers; Union Membership and Coverage Database from the CPS, **www.unionstats.com**.

Figure 1: Shrinking middle-income group



Note: Income measure includes both earned and unearned income. The source is the CPS March data extracts produced by the Center for Economics Policy Research. Available at **http://ceprdata.org/cps-uniform-data-extracts/march-cps-supplement/march-cps-data**.

middle-income group is through a shift-share decomposition that divides the change in the middle-income group into two parts:

- the change in union density, and
- the change in the proportion of union workers who were in the middle-income group relative to the proportion of non-union workers in that group.

Let MC_U and MC_N be the share of union and non-union workers who are in the middle-income group respectively, and let U be the union share of the workforce. Then, if MC (middle class) is the share of the workforce in the middle-income group, the following identity applies:

$$MC = (1-U)MC_N + UMC_U = MC_N + (MC_U - MC_N)U \quad (1)$$

The statistics in table 1 show that among parents in 1985 the share of union workers in the middle-income group was 12 percentage points larger than the share of non-union workers in the middle-income group (63.50 percent – 51.82 percent). Given the 19 percent of parents who were union in 1985, unionization contributed 2 percentage points (0.12 x 0.19) to the overall proportion of workers in the middle-income group among 1985 parents. The effect of unionism on the income distribution of non-union workers through labor market spillovers or through union influence on public policies

favorable for workers could produce a larger or smaller impact.[2]

Taking changes of equation (1) over time, the change in the share of the workforce that is middle-income group can be decomposed as following:

$$\Delta MC = \Delta MC_N + \Delta(MC_U - MC_N)U + (MC_U - MC_N)\Delta U + \Delta(MC_U - MC_N)\Delta U \quad (2)$$

The first term, ΔMC_N, measures how the change in the proportion of non-union parents and non-union children in the middle-income group affects the overall change in the size of the middle-income group: this is –7 percentage points (=45.13 percent–51.82 percent). The second term, $\Delta(MC_U - MC_N)U$, measures the change in the share of union workers compared to the share of non-union workers in the middle-income group, multiplied by the 19 percent parents' unionization rate. The statistics from table 1 show a 4 percentage point drop[3] in the difference in the share of union and non-union workers in the middle-income group among parents compared to offspring. To the extent that this reflects weakening unionism over time, it contributes about 0.008 percentage points (= –0.04 x 0.19) to the fall in the size of the middle-income group.

The third term, $(MC_U - MC_N)\Delta U$, is the standard shift component in a shift-share decomposition. It measures the impact of the 8 percentage-point drop in union density between 1985 and 2011 on the proportion of the workforce in the middle-income group, given the difference in the share of union and non-union parents in the middle-income group in 1985 (12 percentage points). It contributes about 1 percentage point (= - 0.08 x 0.12) to the fall in the overall size of the middle-income group. The final term, $\Delta(MC_U - MC_N)\Delta U$, is the interaction between the change in the share of union and non-union workers in the middle-income group and the change in union density. It adds about 0.3 percentage points (= -0.04 x -0.08) to the middle-income group share of the work force.

In sum, the "pure shift effect" of the decline in unionism contributes about 12 percent (= 0.010/0.08) to the 8 percentage-point drop in the share of the middle-income group of workers. If the weakening in unions' ability to boost workers

2 It will be larger if union wages and benefits spill over to non-union firms who mimic them to avoid union drives or if unions successfully lobby legislatures for laws favorable to all workers (the "threat" effect). It will be smaller if union wages and benefits reduce employment in the union sector, which increases the labor supply and reduces wages in non-union work (the "crowding" effect). Evidence suggests that the threat effect dominates the crowding effect and that unions raise wages for non-union workers (Farber 2005; Neumark and Wachter 1995).

3 The difference in the share of union and non-union parents in the middle-income group is 11 percentage points (=63.50%–51.82%) and the difference in the share of union and non-union offspring in the middle-income group is 7 percentage points (=53.17%–45.13%). This results in a 4 (=7–11) percentage-point drop from parents to offspring in terms of the gap between union and non-union proportion in the middle class.

Table 1: The proportion of unionized and proportion of workers by position in the income distribution for parents and offspring, by union status

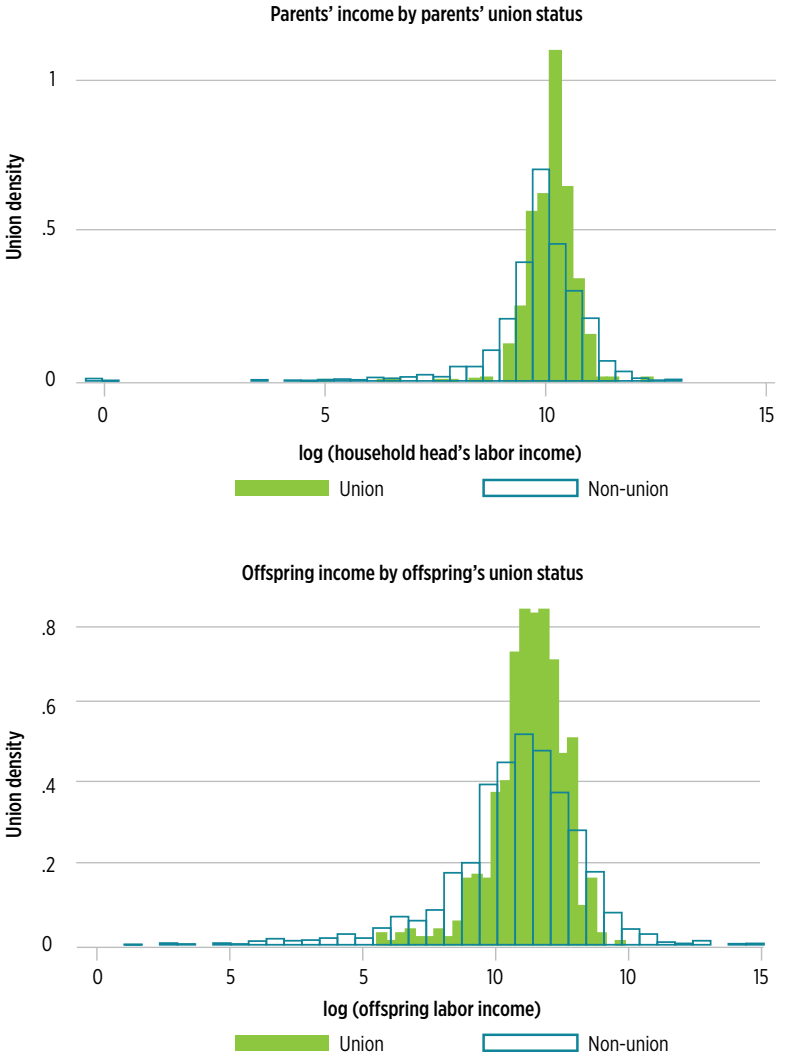
	ALL		UNIONIZED		NON-UNIONIZED	
	PARENTS	OFFSPRING	PARENTS	OFFSPRING	PARENTS	OFFSPRING
	1985	2011	1985	2011	1985	2011
Proportion unionized	19.07%	10.90%	100%	100%	0%	0%
INCOME DISTRIBUTION						
Upper income group	31.61%	33.03%	31.74%	36.67%	31.58%	32.58%
Middle income group	54.04%	46.01%	63.50%	53.17%	51.82%	45.13%
Lower income group	14.35%	20.96%	4.77%	10.17%	16.60%	22.29%

Note: Median income is the median of household income for working-age (ages 25–64) heads of household. The 1985 sample represents parents while the 2011 sample represents their children. The middle-income group is heads of household aged 25–64 whose family incomes fall between 0.5 and 1.5 times the median family income. The upper income group is heads of household aged 25–64 whose family incomes are greater than 1.5 times the median family income. The lower income group is heads of household aged 25–64 who earn an income less than 0.5 times the median family income. Data sources are the PSID 1985 and 2011 files.

into the middle-income group is attributed to the fall in union density, the decline of unionism contributes an additional 0.7 percentage points to the drop, thus accounting for almost 20 percent (= (0.007+ 0.010)/0.08) to the decline of the middle-income group. If the wage distribution of union and non-union workers was assumed to be stable between 1985 and 2011, and union density remained at its 1985 level, the size of the middle-income group in 2011 would have been higher by 1.4 percentage points (17 percent of 8 percentage points).

As noted previously, the reason union workers are disproportionately in the middle-income group is that collective bargaining tends to compress the distribution of wages for covered workers so that union workers have a narrower distribution than non-union workers (Western and Rosenfeld 2011; Card, Lemieux, and Riddell 2004; Pontusson, Rueda, and Way 2002; DiNardo, Fortin, and Lemieux 1996; Freeman 1980; 1991; 1992; Card 1992). Figure 2 shows this phenomenon separately for parents in 1985 and for their offspring in 2011. For both parents and offspring, the income distribution of union workers is more concentrated towards the center compared to that of non-union workers. The income distribution of offspring, however, is more dispersed than the income distribution of their parents, which reflects the higher income inequality in 2011 than in 1985.

Figure 2: Income distribution for union workers and non-union workers



From this perspective, the statistics from table 1 on the fraction of people making less than 50 percent of median income deserves particular attention. The fraction of people who belong to this lower income group increased from 14 percent among parents in 1985 to 21 percent among offspring in 2011. The decline in unionization might have contributed to the fraction of young workers who did not make it to the middle-income group. If equation (2) is modified to assess the effect of the fall in unionism on the higher share of offspring than of parents in the lower income group, the decline in the union density between parents and offspring can be estimated to contribute about 1 percentage point[4] to the 7 percentage-point greater share of offspring than their parents in the lower income group, or 14 percent.

In sum, however the data is organized, the decline of unionism appears to have contributed to the shrinkage of the middle-income group of the workforce and the increasing proportion of the lower income group, with a noticeable but not huge magnitude commensurate with unions' declining role in the U.S. labor market. To the extent that the decline of unions impairs the wages of non-union workers, as Western and Rosenfeld (2011) argue, this is a conservative estimate of the impact of falling unionism on the middle class.

Unionism and Intergenerational Transmission of Economic Status

The PSID provides details on the characteristics of families, including the labor income and union status of the household head and of the head's wife,[5] and of their adult offspring 20–30 years later. To obtain a sample of parents and their adult offspring, the 1985 and 2011 PSID files are matched by individual and a new file, limited to individuals who were children or stepchildren of the head of a household in 1985 and were heads of household or the wives of household heads in 2011, is created. The offspring sample is restricted to be younger than 38 years old in 2011 (younger than 12 years old in 1985) so that they are young enough to be influenced by parents' economic status.

4 The 0.01 percentage-point estimate is obtained by multiplying the different shares of union and non-union parents in the low-income group (16.6%–4.77%) by the 8 percentage-point difference in union density between 1985 and 2011.

5 The PSID defines head of household as someone over age 16 with the most financial responsibility, but if that person is female and married to a man, then he is the head and she is the wife. Therefore, a woman is only the head of household if the household has no adult male who is not incapacitated. The wife also does not necessarily need to be legally married to the household head to be considered a wife in the PSID.

Table 2: Average labor income of offspring by parents' union & education status

	PARENTS	PARENTS WITHOUT COLLEGE DEGREE	PARENTS WITH COLLEGE DEGREE
OFFSPRING OF UNION PARENTS			
Labor income (full-time)	$48,000	$45,600	$53,300
Highest grades completed	14.74	14.39	15.52
Health (1–5, 5=excellent)	3.85	3.75	4.07
OFFSPRING OF NON-UNION PARENTS			
Labor income (full-time)	$45,700	$39,300	$53,800
Highest grades completed	14.67	13.78	15.78
Health (1–5, 5=excellent)	3.88	3.78	4.02

Note: Difference between union and non-union college graduate parents is not statistically significant Calculations are for 26- to 37-year-olds who work full time and who had at least one parent who worked full time in 1985. Data sources are the PSID 1985 and 2011 files. Offspring are in the "union parents" group if they have at least one union parent, and in the "parents with college degree" group if they have at least one college-grad parent.

A new set of 2011 "offspring" variables is created to characterize this group—characteristics of the household heads if the individual was the head of household and characteristics of the wives if the individual was the married or unmarried partner of the male household head. These offspring variables are designed to focus on the relationships between parents and their children rather than between parents and the spouses of their children.[6] Appendix B gives the summary statistics of the main PSID variables in this analysis.

To provide a first look at the relation between parents' union status and their children's income, the labor incomes of full-time offspring is compared by the union status of their parents. Table 2 presents the simple tabulation of unconditional average incomes of children in the sample differentiated by their parents' union status and educational status. Overall, offspring of union parents earn higher incomes than offspring of non-union parents. This difference is more conspicuous for offspring of parents with lower education status. Among children whose parents did not graduate college, the average income of children with a union parent exceeds the average income of children with non-union parents by $6,300, or 16 percent, a difference

6 Because the analysis is limited to heads of household and wives, the data exclude children who were not heads of household or wives, consisting primarily of those living with their parents in 2011.

that is significant at the 1 percent level. The educational attainment is also higher for offspring of union parents. The difference in the average health status between offspring of union and non-union parents is not statistically different from zero. For children who have at least one parent who has graduated college, parental union status had little effect on offspring income. This suggests that unions increase opportunity for children who need it most.

The evidence that the offspring of union parents do better than the offspring of non-union parents raises the question of whether these differences reflect the impact of unionism on offspring outcomes or are the result of observed or unobserved attributes of union parents that give their children an advantage independent of parental union status. These methods do not allow for determination of the effect of unobserved attributes, but do allow for isolation of the union effect from observed attributes in the PSID survey.

To see whether the table 2 differences remain in the presence of other measures of parental attributes, the log of offspring income is regressed on the log of their parental income and other parental characteristics using the following form:

$$LogY_{jk} = \beta_0 + \beta_1 U_k^p + \beta_2 LogY_k^p + \sum d_k X_k^p + \varepsilon_{jk} \qquad (3)$$

where j indexes offspring and k indexes their parents. Y is offspring's labor income[7]; U^p is their parents' union status, where 1 indicates unionized and 0 non-union[8]; Y^p is parents' family income and X^p represents other parental attributes, such as parents' age, race, and ethnicity, their full-time status, education, marital status, industry, and occupations, and the urban status of the household. If U^p is significantly positive, on average the offspring of union parents earn higher income than the offspring of non-union parents.

Table 3 gives the results of the regressions of log (offspring income) on parents' attributes including parents' family income.[9] The coefficient on log (family income) in column 1 is the intergenerational income elasticity (IGE) that measures the association between parental income and offspring income. The estimated coefficient of 0.33 indicates that if parental income increases by 10 percent, offspring's labor income increases by 3.3 percent for

7 To measure the direct effect of parents' unionism on offspring income, offspring's labor income is focused on rather than the combined family income of married couples. The use of labor income drops for offspring with self-employed status or those out of the labor force.

8 For parents' union status, fathers and mothers are looked at separately.

9 The full results for all of the regression analyses are available upon request. Please contact **hane@nber.org**.

Table 3: Estimated relation between parents' family income and union status on log (adult offspring income)

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
Log (family income)	0.326***	0.239***		0.224***		0.237***
	(0.074)	(0.068)		(0.070)		(0.070)
Union father			0.187***	0.0164**	0.185***	0.160**
			(0.062)	(0.064)	(0.060)	(0.061)
Union mother			0.073	0.023	0.060	0.005
			(0.087)	(0.085)	(0.085)	(0.083)
Union offspring					0.186***	0.206***
					(0.059)	(0.058)
Other covariates	No	Yes	Yes	Yes	Yes	Yes
State clustered SE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,068	1,068	1, 068	1, 068	1, 068	1, 068
R-squared	0.066	0.188	0.179	0.193	0.186	0.201

To measure the direct effect of parents' unionism on offspring income, offspring's labor income is focused on rather than the combined family income of married couples. The use of labor income drops for offspring with self-employed status or those out of the labor force.

For parents' union status, fathers and mothers are looked at separately.

Note: Clustered standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Child labor income is the labor income of individuals who were under age 12 in 1985, had at least one parent work full time in 1985, and worked full time in 2011. Family income is the household income of the parents. Other covariates include parental age, education, full-time status, race, industry, occupation, marital status, and the household's urban status.

all persons in the sample.[10] The addition of covariates for parental attributes reduces the coefficient to 0.24 in column 2.

Column 3 of table 3 examines the effect of having union parents on offspring income absent family income but with inclusion of other parental covariates. The binary variable for union status of the father is significant and robust with a magnitude of 0.19, which implies that the adult offspring of unionized fathers earn 19 percent higher income than the adult offspring of

10 Although labor income is used rather than family income of offspring to measure the IGE, this estimate is consistent with literature (Chetty et al. 2014; Lee and Solon 2006). Mazumder (2005) states that the estimated IGE could be subject to the attenuation bias if the data focus on short-term periods, because there could be a long-lasting transitory shock to income.

non-unionized fathers. The binary variable for the union status of the mother is positive but insignificant.[11]

Adding parental family income in column 4 reduces the coefficient on the union status of the father to 0.16, which is still statistically significant. This suggests that the effect of the father's unionism goes beyond their higher income due to the union wage premium. Finally, in columns 5 and 6, a dummy variable is added indicating whether the offspring is unionized. The estimated coefficients on father's union status and parental income do not change much after the offspring's union status is included, even though the estimated coefficient on offspring union status shows that offspring earn a substantial union premium. Compared to offspring whose fathers and themselves have no connection to unionism, offspring whose parents are unionized and themselves are also unionized earn about 36 percent (=16% +20%) higher labor income.[12]

It is worth noting, however, that these union premia for offspring are not directly comparable to other union premia found in the literature since they are not controlled for the child's attributes such as education, experience, industry, occupation, and other typical controls. Only the child's union status is used as on the right side of the regression model to capture the "full effect" of parental union status on children's income, as other controls of offspring could also reflect the indirect effect of unionism through children's education, health, or occupation choice.

The results in table 4 are obtained by disaggregating the analysis by gender of the offspring. The effects of log family income on log of offspring income are similar for sons and daughters, but the result is greater and more significant for daughters than for sons (the effect for sons is not statistically significant at the 90 percent level but this likely reflects the fact that the sample size has been cut by approximately half from table 3). Fathers' union status has a greater impact on daughters' income than on sons', but the sign of the union status is consistently positive across model specifications for sons.

To what extent does the effect of parents' unionism show up in other measures of socioeconomic well-being of offspring? This question is examined by estimating variants of equation (3) that replace offspring income with measures of education attainment and health, as reported by individuals on a 1 to 5 scale that is coded so that 5 = excellent health and 1 = poor health

11 A binary variable is also used indicating if at least one of the parents is a union member (1 if the father or mother is union and 0 of both of them are non-union), and the coefficient is 0.15 and statistically significant at 1 percent of the significance level.

12 The effect of parents' unionism is analyzed controlling for separate labor incomes of household heads and their wives rather than controlling for parent's family income, and similar results are obtained.

Table 4: Estimated relation between parents' family income and union status on log (adult sons' income) and log (adult daughters' income)

VARIABLES	SONS				DAUGHTERS			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Log(family income)		0.201		0.212*		0.265**		0.283***
		(0.129)		(0.126)		(0.106)		(0.104)
Union father	0.142	0.125	0.133	0.115	0.219***	0.181**	0.220***	0.181**
	(0.087)	(0.087)	(0.083)	(0.083)	(0.070)	(0.072)	(0.070)	(0.071)
Union mother	-0.017	-0.054	-0.014	-0.053	0.240	0.162	0.219	0.130
	(0.137)	(0.137)	(0.133)	(0.132)	(0.145)	(0.137)	(0.146)	(0.141)
Union offspring			0.247**	0.260**			0.133	0.173
			(0.073)	(0.074)			(0.112)	(0.115)
Other covariates	YES	YES	YES	YES	YES	YES	YES	YES
State clustered SE	YES	YES	YES	YES	YES	YES	YES	YES
Observations	566	566	566	566	502	502	502	502
R-squared	0.231	0.241	0.242	0.253	0.228	0.246	0.231	0.252

Note: Clustered standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1 . Child labor income is the labor income of individuals who were under age 12 in 1985, had at least one parent working full time in 1985, and worked full time in 2011. Family income is the household income of the parents. Other covariates include parental age, education, full-time status, race, industry, occupation, marital status, and the household's urban status.

Table 5: The effect of parents' unionism on education attainment and health status of offspring

VARIABLES	HIGHEST GRADE COMPLETED		HEALTH (1–5, 5=EXCELLENT)	
	(1)	(2)	(3)	(4)
Union father	0.525**	0.492**	0.137*	0.131*
	(0.225)	(0.230)	(0.076)	(0.076)
Union mother	0.271	0.196	0.162*	0.135
	(0.309)	(0.303)	(0.083)	(0.086)
Log(family income)		0.357***		0.119*
		(0.111)		(0.066)
Other covariates	Yes	Yes	Yes	Yes
State clustered SE	Yes	Yes	Yes	Yes
Observations	1,033	1,033	1,381	1,381
R-squared	0.324	0.328	0.095	0.097

Note: Clustered standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Education and health are for children who were below age 12 in 1985 and had a head of household working full time. Other covariates include parental age, full-time status, education, race, industry, occupation, marital status, and the household's urban status. Education regressions are only for children who work full time.

status. In table 5, the results for the education measure show that for offspring having a union father, the highest grade completed even with the same family income (columns 1 and 2) substantially increases. Columns 3 and 4 of table 5 give the results for the health measure of offspring. The health status of offspring is positively associated with both father's and mother's union status. The results hold with the addition of family income. This may reflect health care and childcare benefits that unions provide to their members. Higher education attainment and better health status of offspring of union parents will also contribute to higher lifetime earnings of offspring.

Given the many pathways by which educated and skilled workers pass on economic advantages to their children, it is important to determine whether the union parents' effect on offspring income is stronger among more educated and skilled workers or among less educated and skilled workers. In the former case, the union effect would reduce relative mobility associated with education and skill while in the latter case the union effect would increase relative mobility.

This issue is examined by dividing the sample into fathers with no college education and fathers with at least some college education and between fathers in blue-collar occupations compared to fathers in white-collar occupations.

Table 6: Estimated effect of fathers' unionism and income on log (offspring income), by parents' education or occupational group

VARIABLES	NO COLLEGE		AT LEAST SOME COLLEGE		BLUE COLLAR		WHITE COLLAR	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Union father	0.275***	0.195**	0.107	0.104	0.213***	0.146**	0.067	0.067
	(0.083)	(0.088)	(0.086)	(0.085)	(0.075)	(0.069)	(0.100)	(0.100)
Log (father labor income)		0.284***		0.059		0.293***		0.036
		(0.066)		(0.097)		(0.069)		(0.122)
Other covariates	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State clustered SE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	435	435	479	478	498	497	416	416
R-squared	0.234	0.263	0.059	0.06	0.194	0.23	0.047	0.047

Note: Clustered standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Child labor income is the labor income of individuals who were under age 12 in 1985, had a father who worked full time in 1985, and worked full time in 2011. Other covariates include the father's age, race, industry, occupation, marital status, and the household's urban status.

This educational cutoff is used because it maximizes sample size in the high- and low-skill groups. Equations (3) and (4) are then estimated for these groups. The results in table 6 show that the union effect in raising the income of offspring is concentrated among the children of fathers with less education and blue-collar jobs. While one potential explanation is the large union wage premium for low-skilled workers (Hirsch and Schumacher 1998), the inclusion of the father's labor income variable, which should reflect the wage premium, still leaves a sizable independent union effect.

Living in a Higher Union Density Community

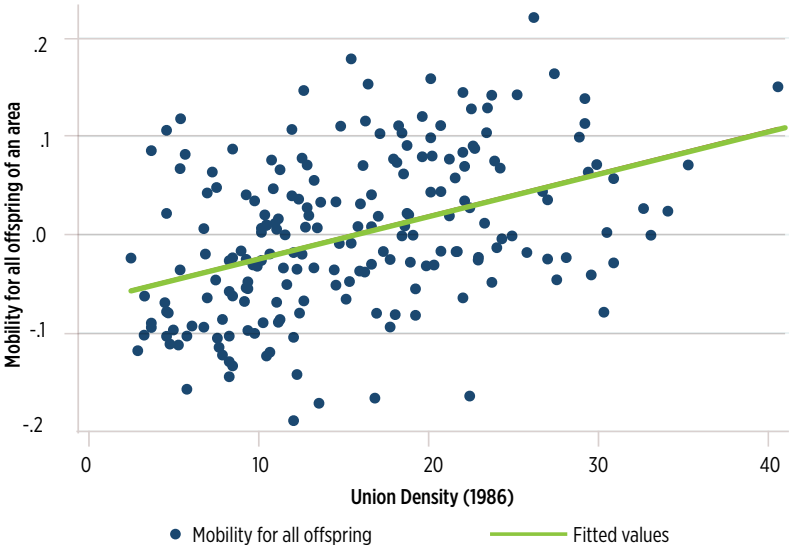
The link between the rate of unionization in the geographic community in which young persons were raised and their future income, conditional on their parents' income and the average income in their community is examined. To do this, the average 2011–12 family incomes of a 1980–82 birth cohort is linked to the average 1996–2000 family incomes of their parents by county and commuting zone from "Intergenerational Mobility Statistics and Selected Covariates by County" data provided by Chetty et al. (2014).[13] This data is combined with union density data from Hirsch and McPherson's Unionstats CPS-based estimates for metropolitan statistical areas. Matching the two data sets involves technical complications that are described in appendix C; summary statistics for this matched data are given in appendix D.[14]

Aggregation of the parent-offspring relation in the second section of this paper should by itself produce a relationship between unionization of

13 The data by commuting zone and county is publicly available at **www.Equality-of-Opportunity.org**.

14 Most covariates come from the publicly available folder of Chetty et al. on **www.equality-of-opportunity.org**: population, percent of children with a single mother, commute time, high school dropout rates, college graduation rates, local tax and spending, the Gini coefficient, social capital, a state's Earned Income Tax Credit coverage, and the progressivity of the state's tax code. Single mother rates, dropout rates, and commute times were four of the "five factors" Chetty et al. found significant in their analysis. The Gini coefficient of just the bottom 99 percent is not included, because it is based on their non-public tax data and is not provided at the county level. Other covariates are added: first, industry, since some industries are more unionized than others, from data on industries in the Chetty et al. raw data folder from the 2000 Census: "Sex by Industry for the Employed Civilian Population 16 Years and Over." The industries are placed into five categories. Second, multiple race variables are created. Using race data from the 2000 Census in the National Historical Geographic Information System (NHGIS) in the public data folder of Chetty et al., variables are created for the percentage of the MSA that is non-Hispanic black, non-Hispanic Asian, non-Hispanic "other," and Hispanic. Third, U.S. Census data is added from 2000 on the child poverty rate, average number of children per family, and median value of owner-occupied housing units.

Figure 3: The correlation between union density and mobility of offspring within commuting zones



Note: Mobility for all offspring of an area is the residual from a regression of the log mean child income in an area on the log mean parent income of that area. The union density by commuting zone is from 1986 and the offspring income is from 2011–12 for the 1980–82 birth cohort.

an area and future incomes of children raised in the area relative to their parents' income. If children from unionized families earn higher incomes than children from otherwise comparable non-union families, aggregating the parental income during their formative years and the future incomes of children brought up in the area should yield higher incomes for children relative to parents in areas with higher union density. But the rate of unionization of an area may also affect the future incomes of all children in the area through potential union impacts on area resources (spillover effects of unionism). Unions generally advocate policies that benefit workers, such as raising minimum wages, increasing education spending, and improving public services, so that the effect of unionism may show up in higher incomes for all children from the area regardless of the union status of their parents.[15]

15 Cox and Oaxaca (1982) find that states with higher union density have higher minimum wages. Gilens (2014) shows that unions are advocates for policies supported by the middle-income group.

Table 7: Estimated effect of area unionism on log (mean offspring income)

VARIABLES	(1)	(2)	(3)
Log (mean parents' income)	0.617***	0.547***	0.582***
	(0.063)	(0.079)	(0.053)
Union density, 1986		0.309***	0.198***
		(0.127)	(0.072)
Other covariates	YES	YES	YES
State dummies			YES
State clustered SE	YES	YES	YES
Observations	203	161	161
R-squared	0.617	0.889	0.970

Note: Clustered standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Covariates include population size, race, percent of children with a single mother, commute time, occupational sector, high school dropout rates, child poverty rate, average number of children per family, median value of owner-occupied housing units, per capita local tax and spending, the Gini coefficient, social capital, whether the state has an Earned Income Tax Credit, and the progressivity of the state's tax code.

As the area data contain no information on the individuals within the area, the two possible routes of impact cannot be distinguished. The analysis is limited to the overall relationship between the union density of a community and the future income of children who grow up in the community.

Figure 3 shows a scatter plot that depicts the correlation between union density of an area and the residual earnings from a regression of the log mean offspring income on the log mean parent income of that area. Since the residual captures the earnings that are not associated with parental income, it can measure the mobility of all offspring in an area. The figure presents the positive association between the unionization of a community and the future income of children brought up in that community, controlling for their parents' incomes. The 2011–12 income (controlling for parents' income) for the 1980–82 birth cohort is higher if they grew up in the commuting zones with higher union density.

To estimate the magnitude of the effect of union density on the 2011–12 income of persons who had resided in that zone, the following model is used:

$$Log\bar{Y}_i^o = \beta_0 + \beta_1 U_i^p + \beta_2 Log\bar{Y}_i^p + \sum d_i X_i + \varepsilon_i \quad (4)$$

where i indexes commuting zone (CZ), o indexes offspring, and p indexes their parents. $\bar{Y}_i^p$ measures the average income of parents in the i^{th} CZ over

1996–2000, and $\bar{Y}_i^o$ measures the average income of offspring in the same CZ. The union density figure is for 1986, which is when the young persons would have been 4–6 years old. Because relative union density by area is a stable statistic, the results should be similar for union density over other time periods. To reduce the potential that the effect of unionism will be confounded with that of other area variables, the X vector in the regression controls for a large set of covariates, including many that could be channels for unionism to increase mobility such as, social capital, tax progressivity, the coverage of a state Earned Income Tax Credit (EITC), and lower child poverty, as listed in the note to table 7.

Column 1 of table 7 gives the estimated coefficient on log of the mean parental income in CZ on the log of the mean of their offspring income with inclusion of various covariates. The coefficient shows that a 10 percent increase in a CZ's average parents' income increases the average income of offspring in that CZ by 6.2 percent—a larger IGE than is found in the regressions for individuals, possibly due to lower measurement error for area incomes or to neighborhood spillovers.[16] When union density is added to the column 2 regression, an area's union density is indeed positively related to its intergenerational mobility. Column 3 puts the estimated union density effect to a stringent test by including dummy variables for each state. The coefficient on union density falls but still remains substantial—a 10 percent increase in union density is associated with a 2 percent increase in child income. The robustness of the results strongly suggests that the positive relationship between parents' unionism and offspring income is more than a correlation.[17]

In sum, the area data, which was derived from a different data source than the PSID, tell a similar story about the positive association of unionism to the income progress of young persons. The data also show that unionism is highly correlated with the well-being of all children in an area, not just children of union parents. While the data do not allow for decomposition of the area effects into those due to more young people growing up in union homes or larger spillover effects, the similarity of the estimated union effects provides

16 The coefficient on the parents' income is similar to an IGE—a typical measure of immobility—but has a different interpretation since an IGE based on individual income and this elasticity is based on the mean income of individuals within an area. Hence, there is a single elasticity for each CZ.

17 As a robustness check, an analysis is performed of the effects of areas' union density on mobility within that area using the "absolute upward mobility (AM)" measure used in Chetty et al. The expected income ranking of children whose parents are at the 25th percentile of the national income distribution is higher if the children grew up in a community with higher union density (see appendix E for a detailed description and the result of this analysis). Although the AM focuses on disadvantaged children, the result is consistent with the findings in table 7.

some assurance that the results are not the artifact of a particular kind of data or modeling exercise.

Discussion

The evidence in this paper shows that parents' unionism has a significant relationship with their offspring's well-being. The adult offspring of unionized parents earn higher labor income compared to the offspring of non-unionized parents. The offspring of unionized parents also attain higher levels of education and better health status. The intergenerational union premium is stronger for less educated/skilled parents than for more educated/skilled parents. The evidence also suggests that there may be spillover effects of unionism. Relative to their parents, the children of an area with high union density are better off.

These findings suggest a strong relationship exists between unions, mobility, and the middle class. Proving causality, however, is difficult without experimental or quasi-experimental data, which have become the gold standard in modern empirical economics. But these findings hopefully will trigger further research into whether a causal relationship between unions and intergenerational mobility exists.

If there is a causal component to the strong correlations found, the natural implication is that the United States will find it harder to address the problem of the diminishing middle-income group than if trade unions were as strong and viable as they were 30, 40, or 50 years ago. A strong union movement is not simply sufficient for high levels of intergenerational mobility and middle-class membership, but it could be necessary. If that is the case, it will be difficult to meaningfully increase intergenerational mobility and rebuild the middle class without also rebuilding unions or some comparable worker-based organizations. ■

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Appendix A

Summary statistics from the PSID 1985 and 2011 files

VARIABLES	N	MEAN	SD	MIN	MAX
Family income (parent)	1,084	$36,120	$19,505	$2,952	$126,800
Wife labor income (parent)	971	$6,549	$8,043	0	$60,000
HH labor income (parent)	1,084	$26,646	$16,671	0	$115,000
White household head (parent)	1,084	0.858	0.349	0	1
Black household head (parent)	1,084	0.098	0.297	0	1
American Indian household head (parent)	1,084	0.004	0.060	0	1
Asian household head (parent)	1,084	0.004	0.064	0	1
Hispanic household head (parent)	1,084	0.030	0.169	0	1
Married household head (parent)	1,084	0.902	0.297	0	1
Never married household head (parent)	1,084	0.039	0.193	0	1
Widowed household head (parent)	1,084	0.005	0.074	0	1
Divorce household head (parent)	1,084	0.040	0.196	0	1
Separated household head (parent)	1,084	0.013	0.115	0	1
High school graduate household head (parent)	1,084	0.795	0.404	0	1
College graduate household head (parent)	1,084	0.195	0.397	0	1
High school graduate wife (parent)	971	0.914	0.281	0	1
College graduate wife (parent)	971	0.340	0.474	0	1
Household head works full time (parent)	1,084	0.952	0.215	0	1
Wife works full time (parent)	971	0.330	0.470	0	1
Union household head (parent)	1,084	0.214	0.410	0	1
Union wife (parent)	971	0.078	0.268	0	1
Blue collar father (parent)	1,084	0.460	0.499	0	1
White collar father (parent)	1,084	0.524	0.500	0	1
Child grades completed	1,084	14.68	1.986	0	17
Child works full time	1,084	1	0	1	1
Child health (1–5, 1 is excellent)	1,084	3.87	.836	1	5

VARIABLES	N	MEAN	SD	MIN	MAX
Child rural upbringing	1,084	0.086	0.281	0	1
Child urban upbringing	1,084	0.250	0.433	0	1
Child suburban upbringing	1,084	0.436	0.496	0	1
Child other upbringing	1,084	0.029	0.169	0	1
Child labor income	1,084	$46,311	$29,391	0	$225,000
Child family income	1,084	$72,586	$60,984	$3,600	$1,553,500
Child union status	1,084	0.131	0.338	0	1
Child age	1,084	31.06	3.38	25	37

Note: "Child" statistics represent the characteristics of individuals who were under age 12 in 1985, had at least one parent work full time in 1985, and worked full time in 2011. "Parent" statistics represent characteristics of their parents.

Appendix B

Issues in Linking Commuting Zone Data from "Intergenerational Mobility Statistics and Selected Covariates by County" and Unionization Data from Unionstats.org

There are problems in linking the geographic area incomes from the tax data and the geographic union densities from the Unionstats.org data. The average parent and offspring income data relate to counties and commuting zones (CZ), which are themselves collections of counties. The union data are available on the metropolitan statistical area (MSA) level, which are also collections of counties (except in New England, as described subsequently). The geographic analysis takes place on the CZ level. The primary advantage of CZs over MSAs is that the CZ file of Chetty et al. comes with state IDs, which allows for use of standard errors clustered at the state level to control for geographic and state-specific correlations. Both CZs and MSAs often cross state boundaries (the Washington, D.C., MSA and CZ cover the District of Columbia, Maryland, and Virginia), but the MSAs do not have state IDs and thus state clustered standard errors cannot be used. Each county is assigned the union density of the MSA to which it belongs and these estimates are combined into CZs, dropping counties that are not part of MSAs since there is no union data for them. The correlation between the mobility estimates of the limited CZs and the whole CZs is .94, leading to the belief that this is not a

serious problem. Additionally, the covariates are constructed so that they only include counties for which there is union data.

Another problem in forming this mobility/unionization area data set is that the unionization data for the New England states differs from that for the rest of the country. Instead of MSAs (which are collections of entire counties), they are New England City and Town Areas (NECTAs), which are collections of towns. Thus, counties can belong to multiple MSAs. Fairfield County, Connecticut, for example, belongs to the Danbury, Stamford-Norwalk, and Bridgeport NECTAs. To deal with this problem, the average is taken of the union densities of the NECTAs to which each county belongs from UnionStats.com, weighted by the portion of their 2000 population that lived in each NECTA.[1] For Fairfield County, Connecticut, for example, the union densities of Danbury (17.5 percent), Stamford-Norwalk (10.7 percent), and Bridgeport (15.9 percent) are averaged weighted by each of their 2000 populations (183,303, 353,556, and 345,708 respectively). This produces an estimated union density of 14.15 percent for Fairfield County. These county-level union estimates are then merged with county-level income estimates and other covariates, and collapsed into CZs based on counties.

Finally, because there is no union data outside of MSAs, the analysis does not apply to rural areas. The total population of the CZs in 2000 was 207 million compared to a U.S. population in 2000 of 282 million. While it may make sense to treat rural areas differently than MSAs, there is no way to obtain unionization rates for rural areas to see whether the results do or do not hold for them.

1 The *Union Membership and Coverage Database* is an Internet data resource providing private and public sector labor union membership, coverage, and density estimates compiled from the monthly household Current Population Survey. See **www.unionstats.com**.

Appendix C

Summary statistics from the regional data from federal income tax data

VARIABLES	N	MEAN	SD	MIN	MAX
Union density, 1986	203	0.156	0.078	0.025	0.407
Primary sector	203	0.015	0.019	0.001	0.123
Secondary sector	203	0.214	0.063	0.084	0.462
Tertiary sector	203	0.595	0.451	0.449	0.720
Quartenary sector	203	0.077	0.027	0.027	0.200
Quinary sector	203	0.051	0.026	0.022	0.194
Other sector	214	0.049	0.005	0.038	0.068
Percent black	203	0.122	0.107	0.003	0.468
Percent Hispanic	203	0.085	0.125	0.005	0.869
Percent Asian	203	0.024	0.039	0.002	0.453
Percent white	203	0.746	0.157	0.119	0.977
Percent other race	203	0.023	0.023	0.004	0.258
Gini coefficient	203	0.445	0.066	0.248	0.630
Children per family	203	2.054	0.112	1.826	2.600
Average parents income	203	$84,487	$18,219	$41,711	$149,210
Average child income	203	$46,458	$5,997	$32,100	$64,121
Percent with commute <15 minutes	203	0.314	0.071	0.151	0.508
Single mother families	203	0.227	0.039	0.094	0.355
Social capital	201	-.252	1.006	-2.723	2.397
Dropout rate	163	0.048	0.021	0.011	0.155
Median house value	203	$114,108	$48,573	$52,622	$407,865
Child poverty rate	203	15.52	5.066	5.300	41.244
EITC exposure	203	1.166	3.439	0	21.33
Tax progressivity	203	.988	1.849	0	7.220

Appendix D

Union Density and Intergenerational Mobility for Children Whose Parents Were at the 25th Percentile of the National Income Distribution

Chetty et al. (2014) emphasize a different concept of intergenerational mobility focusing on individual's rankings in the national income distribution. The preferred measure in their paper, which they call "absolute upward mobility (AM)," is the expected rank of the 2011–12 income of a child whose parents' 1996–2000 incomes are at the 25th percentile of their national income distribution. They find that there is a substantial variation in the AM across the United States.

As a robustness check, the AM is also utilized as an additional measure for intergenerational mobility. Appendix E displays the results from the regressions of AM on union density and other characteristics of CZs. Column 1 shows a strong correlation between AM and union density by CZs. The coefficient implies that a 10 percentage-point increase in 1986 union density is associated with a 1.3 percentile increase in the expected income ranking of adult offspring who were born in a household at the 25th percentile income distribution, regardless of the union status of parents. Thus, the coefficient may also be picking up some of the spillover effect of unionization within the region. Although most union workers will be ranked higher than the 25th percentile, unions generally support raising minimum wages and other policies that increase mobility. Thus, children from disadvantageous family backgrounds may be able to move up the income ladder more in terms of ranking if they grew up in areas with higher union density than in areas with lower union density.

To assess the relative strength of this correlation between the AM and the union density, it is compared to the correlation between AM and the five factors that Chetty et al. found to have the strongest relationship with AM:

1. the percent of children with single mothers as parents,
2. the income-adjusted dropout rate,
3. the level of social capital,
4. the percent of workers with commutes under 15 minutes (a measure of segregation), and

5. inequality as measured by the Gini coefficient.[1]

All covariates and the AM are normalized for better comparison. Columns 2 through 7 show that the correlation between mobility and union density is about the same magnitude as the correlation between mobility and dropout rates, social capital, or segregation. Columns 8 and 9 report the coefficients from the multilevel regression of the AM on union density and the other covariates. In column 8, even after controlling for all five factors, the union density still shows a significantly positive association with the AM. Column 9 is controlled for several other covariates—race, industry, median housing value, the number of children per family, tax progressivity, the existence of a state EITC, and the number of children below the poverty line—in additional to the five factors, and union density still remains significant.

1 Chetty et al. (2014) find a Gini coefficient of just the bottom 99 percent of households has a stronger negative association with mobility than an overall Gini does. The overall Gini is used, however, because they do not provide a bottom 99 percent Gini by county and it comes from their federal tax data so public data could not be used.

Appendix E

The correlation between "absolute upward mobility (AM)" and union density within CZs

VARIABLES	AM	AM_NORM	AM_NORM	AM_NORM	AM_NORM	AM_NORM	AM_NORM	AM_NORM	AM_NORM
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1986 Union Density	12.90***								
	(4.579)								
1986 Union Density_ norm		0.333***						0.386***	0.259***
		(0.118)						(0.131)	(0.097)
Dropout Rate_norm			-0.274					-0.050	-0.130**
			(0.110)					(0.088)	(0.52)
Social Capital_norm				0.270**				0.444	-0.030
				(0.132)				(0.084)	(0.072)
Single Mothers_norm					-0.625***			-0.576***	-0.166
					(0.061)			(0.078)	(0.115)
Commute time <15 min_norm						0.255***		0.214**	0.196**
						(0.090)		(0.090)	(0.070)
Gini Coefficient Overall_norm							-0.367***	0.123**	-0.119
							(0.112)	(0.113)	(0.078)
Other covariates									YES
State clustered SE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Observations	203	203	163	201	214	203	203	161	161
R-squared	0.111	0.111	0.070	0.073	0.392	0.065	0.135	0.54	0.783

Note: Clustered standard errors in parentheses. All variables are normalized, except for the first column. Other covariates include race, industry, median housing value, the number of children per family, tax progressivity, the existence of a state EITC, and the fraction of children below the poverty line within MSA. *** p<0.01, ** p<0.05, * p<0.1.

Income and Earnings Mobility in U.S. Tax Data

JEFF LARRIMORE
Federal Reserve Board

JACOB MORTENSON
Georgetown University and
the Joint Committee on Taxation

DAVID SPLINTER
Joint Committee on Taxation

This paper embodies work undertaken for the staff of the Joint Committee on Taxation, but as members of both parties and both houses of Congress comprise the Joint Committee on Taxation, this work should not be construed to represent the position of any member of the Committee. Support for this research from the Washington Center for Equitable Growth is cordially acknowledged.

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Introduction

Individual and family income varies over time. This variation is often correlated with major life events. Some events—promotions, new jobs, or marrying another wage earner—are associated with substantial income gains. Others—such as job losses or divorces—are associated with income declines. This paper analyzes the likelihood and expected magnitude of intra-generational income mobility and estimates the correlation between various life events and observed mobility patterns.

Decomposing mobility patterns is important as policymakers consider the appropriate interpretation of mobility patterns. For example, if most upward mobility comes through marriage or new entrants into the labor market within a family, this presents a different picture of mobility than if the same level of mobility is observed through wage gains achieved from labor market advancements. Tracking individuals and families over time offers additional context to inequality discussions that often focus on single year cross-sections. Furthermore, when evaluating public policies such as tax laws, a valuable consideration is the extent to which policy mitigates or accentuates income changes for those experiencing upward or downward mobility.

The majority of the existing income mobility research is based on survey data from the Panel Study of Income Dynamics (PSID) (Acs and Zimmerman 2008; Bradbury and Katz 2002; Gittleman and Joyce 1999).[1] However, these data are limited by relatively small sample sizes (the PSID surveys between 5,000 and 8,000 families) and have the well-known concern that measurement error in survey data may appear as mobility, potentially upwardly biasing mobility estimates (Gardiner and Hills 1999; Jarvis and Jenkins 1998; Rendtel, Langeheine, and Berntsen 1998; Solon 1992).[2] Top-coding, non-response, and misreporting in the tails of the distribution may also distort

1 This literature is closely linked to the related literature considering transitions out of poverty including which groups of individuals are likely to experience only transitory poverty and which groups are likely to persist in poverty for extended periods (Bane and Ellwood 1986; Gottschalk and Danziger 2001).

2 Gittleman and Joyce (1999) acknowledge this problem and address it by averaging five years of income, and measuring mobility from one five-year average to the next. This captures mobility trends in *permanent income*, but by design excludes most *transitory income* from the mobility measure since transitory income shocks are filtered out along with measurement error.

extreme incomes (Bollinger et al. 2014), which adds further uncertainty to estimates of mobility from survey data.

Recognizing the issues with survey-based mobility data, this paper uses a panel of tax return data compiled from restricted access Internal Revenue Service (IRS) administrative records from 1999 through 2011. Using these data, determinants of trends are explored for individual wage earnings, such as wage growth within a job, employment changes within an industry, or changing jobs into a new industry. Next, the paper examines variation in family income, where tax units are proxies for families, which consist of individuals appearing on the same tax return.[3] The paper estimates the contribution of life transitions, such as marriage, divorce, job changes, or geographic mobility, to the observed mobility levels of tax units. Finally, tax data show how federal taxes and tax credits affect mobility patterns—either by alleviating or accentuating the hardship from downward mobility or by reducing or accelerating the gains from upward mobility.

The use of administrative data to consider these questions builds on a recent line of research that established the value of such data for mobility questions (see e.g., Chetty et al. 2014; Auten, Gee, and Turner 2013; and Kopczuk, Saez, and Song 2010). But despite the increased prevalence of administrative data in research exploring income mobility, Auten and Gee (2009) is the only previous paper known to the authors that uses administrative tax return data to consider potential causes of intragenerational income mobility, and no previous research has used administrative tax data to consider how taxes interact with mobility. This paper also adds to the literature by analyzing W-2 data linked to tax returns. These data allow for estimation of employment-based life transitions for individuals or families, something prior tax-return based research has not considered.

These data reveal that almost half of all working adults in the United States experience a change in earnings of at least 25 percent over a two-year period, which is in line with findings by the Congressional Budget Office (2008) using Social Security Administration and Survey of Income and Program Participation (SIPP) data. Large swings in individual earnings are strongly correlated with job changes, although there is little difference in the level of mobility experienced by those who change jobs within their industry versus those who transition to a new industry. Marriage has a positive impact on individual labor earnings mobility for men, while it has a negative impact on individual labor earnings mobility for women.

3 While this sharing unit is common in the tax literature (see e.g., Piketty and Saez 2003), it is distinct from the Census Bureau's definition of a family, which consists of at least two individuals who are living together and are related by birth, marriage, or adoption (Lofquist et al. 2012).

When considering a broader definition of total tax unit income, the overall levels of mobility are similar—suggesting the results are robust to the unit of analysis. Large income gains are most likely among families that add workers, either through marriage or through a second family member entering the workforce, although mobility is not limited to these families. Approximately two-fifths of families that maintain the same number of workers still experience upward or downward swings in income of at least 25 percent over two years.

These large income swings are partially offset by changes in tax liabilities for many families, particularly those higher in the income distribution where marginal tax rates are greater. However, families near the lower end of the distribution that experience large income declines often see those losses accentuated by the loss of tax credits such as the Earned Income Tax Credit (EITC).[4] This supports the findings of Bitler, Hoynes, and Kuka (2014) who observe that while the EITC successfully reduces the incidence of poverty and near-poverty, that support is lost for those who experience a substantial economic hardship.

Data: Panel and Income Definitions

Individual Panel

This paper draws on a 0.1 percent random sample of individuals from the IRS Statistics of Income (SOI) Databank, which is an individual level panel containing every person with a taxpayer identification number who was born before 2012 and had not died by 1996. For each individual, the SOI Databank includes data originating from Form 1040 (marital status, number of dependents, and Schedule C income), Form W-2 (wages and employer identifiers), Form 1099-G (unemployment insurance), and the Death Master File (sex and year of birth). Data is also merged from Form 1098-T (university student status). This panel is an individual level sample, which is used when analyzing individual labor earnings mobility.

Tax Unit Panel (Enhanced CWHS)

An enhanced version of the IRS Continuous Work History Sample panel (CWHS) from 1999 to 2011 is used to analyze tax unit incomes. The

4 Note, however, that due to limitations of the data the after-tax income definition used in this study does not include temporary transfers excluded from tax data—such as income from Temporary Assistance for Needy Families, Supplemental Security Income, or in-kind transfers such as the Supplemental Nutrition Assistance Program or Medicaid—which may help offset some large income losses.

conventional CWHS panel is commonly used by researchers with access to tax return data. It includes all tax returns for which the primary filer's Taxpayer Identification Number (TIN) has the last four digits matching one of 10
combinations, which represents approximately 0.1 percent of all tax returns filed each year.

Because TINs are time-invariant for each individual, any individual with a CWHS qualifying TIN tends to remain in the panel over time. Individuals drop out of the panel in a given year if they fail to file a tax return or are listed second on a joint return and can exit permanently if they emigrate or die. However, each annual cross section of the conventional CWHS panel remains representative of the filing population, as new taxpayers with CWHS qualifying TINs enter the panel when they file tax returns.

While the conventional CWHS data is a valuable resource for tracking individuals over time, three significant improvements are made in this paper to address known limitations of the data. First, the substantial male bias that has been found in the panel (Dowd and Horowitz 2011) is corrected. Selection into the conventional CWHS sample is based on the primary filer's TIN, which means that a single individual with a CWHS qualifying TIN will generally drop out of the panel upon marriage if they are not listed as the primary filer on their joint return. Because the vast majority of married couples list the male as the primary filer, men are over-sampled when following individuals over time. To address this limitation, the data used in this paper include joint tax returns that list CWHS qualifying TINs as secondary filers (retrieved from the *universe* of federal income tax returns using the IRS Compliance Data Warehouse (CDW).[5] In cases of married couples filing separately, incomes from the two separate returns are combined. This refinement allows individuals to be followed through marriage or divorce and removes the gender bias in the dataset.

The second limitation of the conventional CWHS data is that it is based solely on annual income tax returns (1040, 1040EZ, etc.), and individuals drop out of the panel if they fail to file a tax return in a given year. This causes the panel to only be representative of the filing population, as opposed to the population as a whole. This paper addresses this limitation by adding income data for non-filers using information return data from the CDW, as long as the individual filed a tax return at least once between 1999

5 Including these additional returns leads to an oversampling of joint filers. To correct for this, we randomly drop about 5 percent of CWHS qualifying TINs such that the fraction of joint filers in the sample approximates that from the actual population.

and 2011.[6] Employers, financial institutions, and government agencies file information returns with the IRS detailing wage income (Form W-2), Social Security income (Form SSA-1099), unemployment income (Form 1099-G), interest (Form 1099-INT), dividends (Form 1099-DIV), retirement saving distributions (Form 1099-R), and miscellaneous income (Form 1099-MISC). Importantly, this filing occurs regardless of whether the individual files a tax return. These information return data provide partial income information for non-filers and are used to construct annual income totals for individuals who fail to file a tax return in a given year and would have otherwise dropped out of the sample.

Finally, a limitation of earlier research using the conventional CWHS data is that it only captures information reported directly on tax returns, which provides no information about employers or the split of wage income between spouses. However, by linking tax records in the CWHS to other tax forms, like the Form W-2, it is possible to separately observe employment information for each individual, including wages, job changes, and industry of employment.

Income Definitions

Both individual labor earnings and the total income of the tax unit are considered in this analysis. Individual labor earnings are defined here as wages and salaries from Form W-2, and self-employment income from Schedule C of Form 1040.[7] Tax-unit income is size-adjusted total cash income, excluding capital gains.[8] This includes wages and salaries, taxable and tax-exempt interest, dividends, alimony, net business income, gross individual retirement

6 The restriction that individuals file at least once rarely binds, both because few people never file a tax return over a 12-year period and because the 2008 Stimulus Tax Rebate incentivized filing for those who otherwise would not have filed a return. The number of tax returns are consistent with those reported by the IRS, and the observation counts—inclusive of non-filers—are similar to Heim, Lurie and Pearce (2014) which are also similar to Census population counts for the adult population. Further details on these comparisons are available upon request from the authors.

7 Self-employment income is reported at the tax-unit level in the CDW data, and is not separated by individual. We assume that self-employment earnings are split evenly between spouses for jointly filed returns. Self-employment income for individuals only includes what is reported on Schedule C on the Form 1040, whereas self-employment income for the tax unit includes both Schedule C income and Schedule E income.

8 We adjust for tax-unit size by dividing income by the square root of the number of individuals in the tax unit. This adjustment is common in income distributional research (see e.g., Gottschalk and Smeeding 1997; Atkinson and Brandolini 2001; and Burkhauser et al. 2011) and is also used by the Organisation for Economic Cooperation and Development in its income inequality official measures (d'Ercole and Förster 2012). It closely matches the household size adjustments implied by the Census Bureau poverty thresholds (Ruggles 1990).

account (IRA) distributions, gross pensions, gross Social Security benefits, rental income, farm income, unemployment compensation, and other income reported on line 21 of Form 1040. Alimony payments, capital gains, and the deductible half of the self-employment tax are then removed. Although non-reported cash and in-kind transfers are excluded, this definition includes Social Security and unemployment income, which are two of the largest transfer programs and represent over 80 percent of cash transfer income (Larrimore, Burkhauser, and Armour 2015). This income definition is similar to that used by Auten and Gee (2009) and by Auten, Gee, and Turner (2013).

Tax liabilities are net of tax credits. The earned income and child credits are refundable, and as a result tax liabilities can be positive or negative. Post-tax income is calculated as pre-tax income (including capital gains) minus net tax liabilities.[9] Tax liabilities are limited to federal income taxes and exclude state and local tax payments as well as payroll taxes.

Sample Restrictions

Similar to most previous studies on income mobility, the sample is restricted in order to avoid including mobility from initial entrance into the labor force. Observations with primary filers under 25 years of age in the first year of each three-year observation period and observations with missing income in the initial or final year, or no income in both the initial and final years, are removed. While some researchers also impose an upper age limit—including Gittleman and Joyce (1999) who exclude individuals over age 64 and Sawhill and Condon (1992) who exclude those over age 54—none is imposed in this paper to include mobility around retirement in the analysis. These sample restrictions are similar to Auten and Gee (2009), but are more restrictive than U.S. Department of the Treasury (1992), which did not have an age restriction and observed substantially greater levels of upward mobility.

Individual Earnings Mobility

Overview of Individual Earnings Mobility Patterns

This analysis begins by examining changes in individual labor earnings over time. One trend is particularly clear: a large fraction of the population

9 Although the authors prefer to exclude capital gains since many gains represent the timing of realizations rather than persistent income (see Armour, Burkhauser, and Larrimore 2014), capital gains are included here since these gains impact reported tax liabilities.

experiences substantial earnings mobility in relatively short time horizons. Table 1 summarizes mobility patterns for men (panel A) and women (panel B) over the course of two years, restricting the sample to individuals with at least $1,000 of earnings in the initial year. Each cell in table 1 displays the percentage of people in a given income quintile in year *t* that experienced a given percent change in income two years later (year *t+2*).

Only 56 percent of working men have earnings within 25 percent of their earnings from two years prior. One-fifth have at least 25 percent more earnings and just under one-quarter earned at least 25 percent less (or have no earnings at all).[10] This volatility occurs at all earnings levels, although the frequency of substantial mobility, and particularly upward mobility, is largest for those starting at the bottom of the distribution. Nearly half of those in the bottom earnings quintile have at least a 25 percent increase in their earnings, whereas only 10 to 13 percent of those in the upper three quintiles have this level of upward earnings mobility.

These patterns are remarkably similar among women with 43 percent experiencing earnings changes of at least 25 percent over the two-year period and 27 percent experiencing a change of at least 50 percent. Additionally, similar to that seen for men, female earnings mobility is greatest for the lowest quintile of the distribution. Nevertheless, the top three quintiles are still experiencing substantial absolute mobility, with roughly one-third experiencing earnings changes in excess of 25 percent.

Contributing Factors to Labor Earnings Mobility

To assess what factors are most associated with large earnings movements, table 2 displays the earnings mobility patterns of men and women by employment and individual characteristics. For both genders, changing jobs, changing industries, and moving to a different state are each associated with higher levels of absolute earnings mobility. Sixty-four percent of men switching jobs experience an earnings change of at least 25 percent, while only 33 percent of all men remaining in the same job experience a similar change. Similarly, 66 percent of men switching industries experience a large absolute change in earnings. Female wage earners exhibit similar patterns.

The prior evidence on the impact of job changes on income mobility is mixed and hinges critically on whether an observed job change results from a

10 As described more fully in the description of the data, earnings is defined here to include both wage earnings and self-employment income. When considering just wage earners and excluding self employment, the results are similar: 47 percent of men and 53 percent of women have a shift in earnings of at least 25 percent, and just under a quarter of men and women experienced an increase in income of at least 25 percent.

Table 1: Individual earnings mobility by initial earnings (2-year mobility, t to t+2, t=1999–2009)

PANEL A: MALE WAGE MOBILITY								% CHANGE IN		$ CHANGE IN		INITIAL WAGE	
INITIAL WAGE QUINTILE	NO FINAL EARNINGS	DECLINE >50%	DECLINE 25–50%	DECLINE <25%	INCREASE <25%	INCREASE 25–50%	INCREASE >50%	MEAN WAGES	MEDIAN WAGES	MEAN WAGES	MEDIAN WAGES	MEAN WAGES	MEDIAN WAGES
<$1,000	—	—	—	—	—	—	—	—	—	$38,800	$25,200	$100	$0
Lowest	8%	10%	8%	13%	12%	7%	41%	68%	22%	$7,200	$2,400	$10,500	$10,800
Second	10%	13%	9%	22%	24%	10%	13%	–3%	–3%	–$800	–$800	$25,900	$25,900
Middle	5%	10%	8%	30%	34%	8%	5%	–6%	–2%	–$2,600	–$800	$41,500	$41,400
Fourth	4%	8%	7%	34%	37%	7%	3%	–6%	–2%	–$3,700	–$1,200	$61,100	$60,400
Highest	3%	9%	9%	34%	34%	7%	5%	–7%	–4%	–$11,000	–$4,000	$149,800	$104,300
All males	**6%**	**10%**	**8%**	**27%**	**29%**	**8%**	**12%**	**–1%**	**–3%**	**–$800**	**–$1,100**	**$57,300**	**$41,400**

PANEL B: FEMALE WAGE MOBILITY								% CHANGE IN		$ CHANGE IN		INITIAL WAGE	
INITIAL WAGE QUINTILE	NO FINAL EARNINGS	DECLINE >50%	DECLINE 25–50%	DECLINE <25%	INCREASE <25%	INCREASE 25–50%	INCREASE >50%	MEAN WAGES	MEDIAN WAGES	MEAN WAGES	MEDIAN WAGES	MEAN WAGES	MEDIAN WAGES
<$1,000	—	—	—	—	—	—	—	—	—	$28,200	$20,200	$100	$0
Lowest	5%	8%	7%	13%	13%	8%	46%	79%	35%	$6,500	$3,000	$8,200	$8,600
Second	9%	12%	9%	22%	25%	10%	13%	–2%	–3%	–$300	–$500	$18,700	$18,700
Middle	6%	10%	8%	28%	34%	8%	6%	–7%	–2%	–$2,000	–$500	$29,700	$29,600
Fourth	4%	8%	7%	32%	39%	6%	3%	–6%	–1%	–$2,800	–$600	$43,700	$43,200
Highest	4%	8%	8%	33%	38%	6%	3%	–8%	–3%	–$7,400	—$1,800	$89,100	$71,500
All females	**5%**	**9%**	**8%**	**26%**	**31%**	**8%**	**13%**	**–1%**	**–2%**	**–$300**	**–$600**	**$29,600**	**$29,000**

Note: All dollar amounts adjusted to 2013 values using the CPI-U-RS. Earnings are W-2 wages and Schedule C income (divided by two if married filing jointly), bottom-coded at zero. The initial income less than $1,000 group is removed from the bottom quintile. Individuals are excluded if they have no earnings in the initial and final years, three-year average earnings less than $5,000, die during the three-year period, or are 25 years old or younger in the initial year of each three-year period. The initial earnings less than $1,000 group, about 4 percent of men and women, is removed from the bottom quintile.
Source: Enhanced CWHS panel and authors' calculations.

displacement or a voluntary job change. For example, Farber (2005) observes that displacements result in substantial wage declines, while Topel and Ward (1992) observe that voluntary job changes are an important source of upward wage mobility for young workers. Whether a change is voluntary in nature, however, cannot be observed in the data so the types of job changes are not separated. While recognizing this limitation, there is no clearly dominant direction for large earnings swings among those who change jobs, although both job changers and industry changers are slightly more likely to experience substantial upward mobility than substantial downward mobility.

Earnings mobility also varies with family life events and exhibits greater variation between males and females. Perhaps unsurprisingly, both men and women who move across state lines are likely to experience a large earnings change. But, in what may be reflective of who is leading the move, in the event of a move to a new state women are more likely to experience a large downward swing in their earnings: 38 percent of women have at least a 25 percent earnings decline compared with 32 percent of men.

The evidence from this analysis also suggests that marriage improves the earnings trajectory of male workers more than female workers. Marriage is associated with large median gains in male earnings (11 percent), but approximately no change in female earnings (1 percent). Similarly, men who get divorced one or two years after the initial year fare worse than women: 38 percent of these men have a 25 percent drop in earnings, whereas only 31 percent of women who get divorced have an earnings decline of this magnitude.

Regression Analyses

A limitation of the previous comparisons is that they cannot separate the relationship between multiple variables of interest. This section uses regression analysis to control for covariates, including life cycle effects (using five-year age bins), starting centile in the income distribution, and the year of observation (using year dummies).

Table 3 considers which factors are correlated with large income changes, with binary dependent variables that indicate whether the individual experienced a 25 percent increase or decrease in their labor earnings over the two-year period. The logit regression results are presented as odds ratios, where odds ratios greater than one indicate that the variable is associated with higher odds of experiencing a 25 percent increase or decrease in earnings, while odds ratios less than one indicate a reduced likelihood of experiencing such an earnings shift.

The regression results support many of the conclusions drawn from the summary statistics in table 2. After controlling for individual level characteristics, changing jobs is still associated with higher levels of earnings mobility, with a

Table 2: Individual earnings mobility by employment and individual characteristics

PANEL A

MALE EARNINGS MOBILITY								% CHANGE IN		INITIAL EARNINGS		
	NO FINAL EARNINGS	DECLINE >50%	DECLINE 25–50%	DECLINE <25%	INCREASE <25%	INCREASE 25–50%	INCREASE >50%	MEAN EARNINGS	MEDIAN EARNINGS	MEAN	MEDIAN	FRACTION OF MALES
Stay in job	—	8%	8%	32%	35%	8%	10%	2%	0%	$64,900	$47,400	69%
Job change	—	19%	12%	19%	18%	9%	24%	–3%	–4%	$45,600	$31,800	22%
Industry change	—	21%	11%	17%	17%	8%	25%	–5%	–5%	$43,800	$30,000	20%
Move to different state	4%	17%	10%	18%	22%	9%	19%	2%	–3%	$59,300	$40,200	4%
Unemp. insur: initial yr	8%	16%	9%	16%	17%	10%	23%	0%	3%	$33,700	$27,200	8%
Unemp. insur: second yr	12%	22%	12%	18%	15%	7%	13%	–26%	–26%	$40,000	$32,500	9%
Unemp. insur: final yr	8%	26%	16%	21%	13%	5%	10%	–29%	–32%	$41,900	$34,500	9%
Single, stays single	8%	16%	8%	23%	24%	7%	15%	–1%	–2%	$39,000	$30,500	34%
Married, stays married	4%	11%	8%	29%	31%	7%	10%	–2%	–3%	$69,400	$50,100	57%
Marriage	4%	20%	7%	21%	24%	9%	16%	13%	11%	$45,200	$35,200	5%
Divorce	15%	15%	8%	22%	21%	7%	13%	–4%	–14%	$55,700	$37,800	4%
Added first dependent	3%	10%	7%	24%	28%	10%	18%	9%	4%	$49,200	$36,500	2%
Added additional deps.	3%	11%	8%	25%	28%	9%	16%	6%	6%	$49,300	$35,700	1%

TABLE 2 CONTINUED ON NEXT PAGE

TABLE 2 CONTINUED FROM PREVIOUS PAGE

PANEL B

FEMALE EARNINGS MOBILITY								% CHANGE IN		INITIAL EARNINGS		
	NO FINAL EARNINGS	DECLINE >50%	DECLINE 25–50%	DECLINE <25%	INCREASE <25%	INCREASE 25–50%	INCREASE >50%	MEAN EARNINGS	MEDIAN EARNINGS	MEAN	MEDIAN	FRACTION OF FEMALES
Stay in job	—	19%	11%	18%	18%	9%	26%	0%	–1%	$31,300	$23,400	21%
Job change	—	20%	11%	17%	17%	9%	27%	–1%	–2%	$30,200	$22,000	19%
Industry change	6%	20%	12%	17%	19%	8%	18%	–4%	–13%	$38,000	$28,800	4%
Move to different state	7%	15%	9%	15%	17%	10%	27%	5%	8%	$23,900	$19,000	6%
Unemp. insur: initial yr	13%	23%	12%	17%	14%	7%	13%	–29%	–31%	$29,500	$23,800	7%
Unemp. insur: second yr	9%	27%	16%	19%	12%	5%	10%	–32%	–37%	$30,700	$25,200	7%
Unemp. insur: final yr	5%	12%	8%	25%	30%	7%	13%	0%	–1%	$34,900	$28,100	41%
Single, stays single	5%	12%	8%	26%	30%	7%	13%	–1%	–3%	$40,000	$31,100	51%
Married, stays married	6%	19%	8%	21%	25%	7%	14%	5%	1%	$36,000	$30,100	4%
Marriage	10%	14%	7%	20%	24%	8%	18%	–3%	–1%	$34,900	$26,200	4%
Divorce	4%	12%	9%	22%	24%	9%	20%	3%	1%	$28,800	$22,800	2%
Added first dependent	3%	12%	9%	23%	25%	9%	19%	7%	6%	$26,600	$21,800	1%
Added additional deps.	—	19%	11%	18%	18%	9%	26%	0%	–1%	$31,300	$23,400	21%

Note: All dollar amounts adjusted to 2013 values using the CPI-U-RS. Earnings are W-2 wages and Schedule C income (divided by two if married filing jointly), bottom-coded at zero. Individuals are excluded if they have no earnings in the initial and final years, three-year average earnings less than $5,000, die during the three-year period, or are 25 years old or younger in the initial year of each three-year period.
Source: Enhanced CWHS panel and authors' calculations.

Table 3: Regression results for the odds of a 25 percent increase or decrease in individual earnings

VARIABLES	MEN		WOMEN	
	DECREASE 25%	INCREASE 25%	DECREASE 25%	INCREASE 25%
	ODDS RATIO	ODDS RATIO	ODDS RATIO	ODDS RATIO
Age 25–29	0.94**	1.67**	1.33**	1.49**
Age 30–34	0.96*	1.51**	1.28**	1.38**
Age 35–39	0.97	1.25**	1.12**	1.27**
Age 40–44	0.98	1.12**	1.03	1.14**
Age 50–54	1.14**	0.89**	1.16**	0.87**
Age 55–59	1.52**	0.75**	1.56**	0.69**
Age 60–64	3.08**	0.51**	3.00**	0.46**
Age 65–69	3.17**	0.46**	3.29**	0.39**
Age >69	3.02**	0.35**	3.38**	0.32**
Student initial yr	0.77**	1.60**	0.79**	1.72**
Job change	1.10**	1.66**	1.20**	1.63**
Change of job & industry	1.71**	1.13**	1.61**	1.15**
Unemp. insur: initial yr	0.63**	2.41**	0.61**	2.46**
Unemp. insur: second yr	2.15**	0.60**	2.35**	0.57**
Unemp. insur: final yr	2.85**	0.49**	3.52**	0.42**
Move to different state	1.27**	1.26**	1.60**	1.16**
Diff state & married init yr	1.22**	1.17**	1.47**	0.77**
Married initial year	0.68**	1.30**	1.10**	1.09**
Marriage	0.80**	1.45**	1.45**	1.05
Divorce	2.15**	0.78**	1.25**	1.17**
Dependents initial yr	0.98	0.96*	1.00	0.96*
Added first dependent	0.71**	1.29**	0.98	1.00
Added additional deps.	0.80**	1.21**	0.86**	1.13*
Agriculture	0.84**	0.83**	1.01	0.91
Mining and oil	1.17**	1.14**	0.99	1.21**
Utilities and construction	0.92**	0.95*	0.91**	1.10**
FIRE & STEM	0.96**	1.23**	0.95**	1.29**
Education & health	0.75**	1.16**	0.87**	1.19**
Entert., accom. & food	0.99	0.90**	1.05*	0.93**
Other services	0.95*	1.01	0.99	1.05*

TABLE 3 CONTINUED ON NEXT PAGE

TABLE 3 CONTINUED FROM PREVIOUS PAGE

VARIABLES	MEN		WOMEN	
	DECREASE 25%	INCREASE 25%	DECREASE 25%	INCREASE 25%
Public admin	1.04	1	0.99	1.28*
Self-employed	2.06**	1.11**	2.20**	1.12**
Control for starting centile	Yes	Yes	Yes	Yes
Control for initial year	Yes	Yes	Yes	Yes
Observations used	663,323	663,323	593,002	593,002
Fraction decr./incr. 25%	27%	24%	25%	24%

Note: Dependent variables are binary variables indicating a two-year decrease or increase of at least 25 percent of individual earnings, where non-positive to positive changes in earnings are considered increases of at least 25 percent. Odds ratios from logistic regressions are reported. Income mobility is measured from t to t+2, where t=1999–2009. Observations are removed if the individual is less than 25 years old in the initial year. Earnings are W-2 wages and Sch. C income (divided by two if married filing jointly), bottom-coded at zero. Intercept, year dummies, and initial year centile dummies are not shown. Number of children in 1999 and 2000 set to 2001 number due to missing data. Retail and Transportation industry code is the excluded industry group and age 45–49 is excluded age group. The fraction with increases or decreases of at least 25 percent differ from table 1 due to inclusion of individuals whose starting wages are under $1,000, who were considered separately in table 1.
* denotes significant at 1 percent level.
** denotes significant at 0.1 percent level.
Source: Enhanced CWHS and authors' calculations.

more pronounced increase in the odds of upward mobility. Changing industry is similarly associated with greater occurrences of mobility, although with a larger increase in the probability of moving down in the distribution.

Even though these regressions focus exclusively on individual earnings, family dynamics matter, and again, marriage has a differential impact on men and women. For men, being younger, being married at the start of the observation period, getting married, or having children are each associated with an increased probability of experiencing at least a 25 percent increase in earnings and a decreased probability of experiencing at least a 25 percent decrease in earnings. For women, on the other hand, marriage does not have the same positive impact on the odds of upward mobility. Instead, women who get married during the observation period have a substantial increase in their odds of downward mobility, with no significant impact on substantial upward mobility.

Recognizing that the industry of occupation may impact mobility patterns, these regressions include the one-digit North American Industry Classification System (NAICS) code associated with the individual's employer in year *t* ("retail trade and transportation" code is the excluded baseline category). Men working in agriculture are much less likely than those in retail or other

industries to experience large earnings shocks *ceteris paribus*, as are men working in construction or utilities. In contrast, health and education workers and FIRE and STEM (finance, investment, real estate; and science, technology, engineering, and math) workers of both genders are disproportionately likely to experience large earnings gains and much less likely to experience large earnings declines.

In order to further assess how the employment events and individual circumstances considered impact average earnings changes, the arc-percentage change in earnings is regressed on the family and employment events discussed previously, controlling for age, year, and initial centile in the income distribution. The arc-percent change is used rather than the percentage change so that gains and losses are treated symmetrically.[11] Next, earnings are transformed into a logistic scale (following Auten and Gee 2009) in order to perform a logistic regression. This approach addresses issues associated with using linear functions to estimate bounded dependent variables. This transformation scales earnings changes so that the logit input, $\widehat{arcp}$, has a range of (0, 1), rather than a range of (–2, 2). Those with no earnings mobility have a dependent variable with a value of one half. Here, their transformation is slightly adjusted in order to avoid a logit input of zero or one:

$$y = logit(\widehat{arcp}) = ln(\widehat{arcp}/(1 - \widehat{arcp}))$$

$$\text{where } \widehat{arcp} = \frac{50 * ArcPercentChange + 101}{202} \quad (1)$$

Table 4 contains the results of this regression, which assesses the impact of factors associated with earnings mobility for men (columns 1 and 2) and women (columns 3 and 4). Among both genders, changing jobs is associated with positive earnings growth—although the effect is somewhat larger for men (38 arc-percent) than for women (30 arc-percent). Recognizing that workers may acquire industry-specific capital that allows them to command higher wages at any job within their industry, greater levels of upward mobility can be expected for those who change jobs within an industry than those who switch industries (Parent 2000). However, whether the job change was within the same industry or to a new industry had little impact on the magnitude of earnings growth, with almost no additional impact from industry changes for men and a small positive effect for women.

11 The arc-percent change equal $2*(x_{final} - x_{initial})/(x_{final} + x_{initial})$. Arc-percentages are bounded by negative and positive two, which result from tax units moving to or from no income (or negative income in the specification). Arc-percent changes offer a "symmetric" measure of gains and losses. For example, assume one income doubles from 100 to 200 and another is cut in half from 100 to 50. Whereas percent changes are 100 and –50 percent, arc-percentage changes are 67 and –67 arc-percent.

As seen in the earlier regression for large earnings changes, working in education and healthcare fields exhibited the greatest positive impact on upward wage mobility for both genders. This may reflect that human capital development is necessary in these fields, which results in individuals becoming more skilled and productive as they gain additional experience, therefore commanding higher wages and exhibiting greater upward earnings mobility. In contrast, men working in the mining and oil industry and both men and women working in public administration experienced less average wage growth (or larger declines) than those working in other industries during this period.

The results of this regression demonstrate the importance of family dynamics for individual earnings mobility, consistent with the results for large earnings swings in table 3. Men who get married, on average, experience earnings growth, while women who get married demonstrate a small earnings decline. Additionally, although men who are married at the start of the observation period exhibit greater earnings growth than their single counterparts, there is no similar increase in mobility for married women. Perhaps counter-intuitively, the presence of children in the tax unit, and having additional children, are both associated with higher levels of upward earnings mobility for men and women. While the regression controls for age, this may partially reflect that men and women who have children are likely to be in their peak years of earnings growth. But it also could partially indicate that the need to support children acts as an income effect and increases effort exerted in the labor market.

A final aspect of family dynamics that appears in the regression is the different effects for men and women moving to new states. Unmarried men who move to a different state experience a small increase in earnings, while married men experience a small decrease. Moving to new states, on the other hand, has a negative impact on the earnings trajectory of women regardless of whether they were initially married or not, and the effect is substantial for married women. This sex and marital status difference in earnings mobility may suggest that long-distance moves among married couples are more likely to favor the husband's employment over the wife's, resulting in slower earnings growth for women.

Tax Unit Income Mobility

Overview of Income Mobility Patterns

The statistics presented in the previous section suggest family composition decisions strongly influence individual earnings. As a result, it may be that individual *earnings* mobility is larger than family *income* mobility, to the extent that spouses act as a stabilizing influence on family income. In a two-earner

Table 4: Regression results for individual earnings mobility from life events

VARIABLES	COEFFICIENT	ARC% EFFECT		
	MEN		WOMEN	
Age 25–29	0.07**	7%	−0.10**	−10%
Age 30–34	0.03**	3%	−0.09**	−9%
Age 35–39	0.01	1%	−0.03**	−3%
Age 40–44	0.01	1%	−0.01	−1%
Age 50–54	−0.06**	−6%	−0.07**	−7%
Age 55–59	−0.23**	−23%	−0.22**	−22%
Age 60–64	−0.67**	−65%	−0.62**	−61%
Age 65–69	−0.75**	−73%	−0.76**	−73%
Age >69	−0.68**	−66%	−0.77**	−75%
Student initial yr	0.17**	17%	0.17**	17%
Job change	0.38**	38%	0.29**	30%
Change of job & Industry	0.00	0%	0.02*	2%
Unemp. insur: initial yr	0.28**	28%	0.30**	30%
Unemp. insur: second yr	−0.67**	−65%	−0.77**	−74%
Unemp. insur: final yr	−0.29**	−29%	−0.43**	−43%
Move to different state	0.05**	5%	−0.08**	−8%
Diff state & married init yr	−0.15**	−15%	−0.33**	−33%
Married initial year	0.25**	25%	0.00	0%
Marriage	0.18**	18%	−0.14**	−14%
Divorce	−0.62**	−61%	−0.23**	−23%
Dependents initial yr	0.01	1%	0.03**	3%
Added first dependent	0.22**	22%	0.11**	11%
Added additional deps.	0.18**	18%	0.16**	16%
Agriculture	0.04*	4%	−0.01	−1%
Mining and oil	−0.06**	−6%	0.03*	3%
Utilities and construction	0.02*	2%	0.04**	4%
FIRE & STEM	0.01	1%	0.03**	3%
Education & health	0.14**	14%	0.10**	10%
Entert., accom. & food	0.02	2%	0.00	0%
Other services	0.02*	2%	0.03*	3%
Public admin	−0.10*	−10%	−0.09*	−9%

TABLE 4 CONTINUED ON NEXT PAGE

TABLE 4 CONTINUED FROM PREVIOUS PAGE

VARIABLES	COEFFICIENT	ARC% EFFECT		
	MEN		WOMEN	
Self-employed	−0.11**	−11%	−0.21**	−21%
Control for starting centile	Yes	Yes	Yes	Yes
R-square	0.295		0.299	
Root MSE	1.490		1.438	
Mean of dependent variable	−0.125		−0.092	
Observations	659,563		590,273	

Note: Dependent variables are two-year arc-percent changes in individual earnings with logistic transformation, as described in the text. Income mobility is measured from t to t+2, where t=1999–2009. The column labeled "Arc% Eff." displays the arc-percentage point effect calculated using (((EXP(b)/(1+EXP(b)))*202)–101)*0.02, where b is the coefficient. Observations are removed if the individual is less than 25 years old in the initial year. Earnings are W-2 wages and Sch. C income (divided by two if married filing jointly), bottom-coded at zero. Intercept, year dummies, and initial year centile dummies are not shown. Number of children in 1999 and 2000 set to 2001 number due to missing data. Retail and Transportation industry code is the excluded industry group and age 45–49 is the excluded age group.
* denotes significant at 1 percent level.
** denotes significant at 0.1 percent level.
Source: Enhanced CWHS and authors' calculations.

family, for example, if one individual loses their job or exits the labor force while the other remains employed, the income mobility for the tax unit will be less than that experienced by a single individual. Additionally, work decisions are influenced by other sources of income flowing into the family, as is the case of an individual who retires but begins receiving Social Security income (which offsets the earnings loss). This section further explores the mobility of family resources by shifting the unit of analyses from individuals to families and considering the size-adjusted income mobility of the tax unit (individuals who file a tax return together) rather than individual earnings mobility.

Table 5 replicates table 1, but does so for the total size-adjusted income of each tax unit. Even when considering the income of tax units rather than individual labor earnings, there remains a substantial level of income mobility, with 42 percent of tax units experiencing an income change of at least 25 percent over the course of two years. When comparing family income mobility to the individual earnings mobility from table 1, it appears families offer a degree of stability, since severe income declines are less frequent than severe labor earnings declines. While 16 percent of men and 14 percent of women saw their labor earnings fall by at least 50 percent or fall to zero, only 7 percent of tax units saw their incomes fall this much.

Examining levels of income mobility at various starting income levels, low- and moderate-income families are much more likely to exhibit upward mobility than high-income families. Forty-three percent of those in the bottom quintile and 27 percent of those in the second quintile have earnings growth of at least 25 percent over the course of two years. Upper income tax units, on the other hand, show the greatest propensity for substantial income declines. Both the degree of mobility and the inverse relationship to an individual's starting point in the distribution are broadly consistent with the findings of Auten and Gee (2009). These results emphasize the extent to which substantial mobility occurs even over short time horizons.

A substantial portion of this mobility, however, is transitory and does not persist into subsequent years. Table 6 shows the fraction of tax units in each quintile, which conditional on having an income shift of at least 25 percent or 50 percent over two years, maintain an income that is 25 or 50 percent below or above their initial level for a subsequent two years. Only around one-third of tax units for which income falls by 25 percent or more after two years remain at their lower income level after an additional two years, and less than 40 percent of those for which income rises by 25 percent maintain that increase. However, the persistence of income gains is greater for those starting lower in the income distribution, while the persistence of income losses is greater for those starting higher in the distribution.

Table 7 displays how the frequency of large earnings changes differs based on family characteristics. This is important since, to the extent that mobility comes from changes in the number of workers, it may suggest the improvement in financial well-being reflects a reduction in home-production or leisure, thus offsetting the true magnitude of the gains. While tax units who add a second worker are substantially more likely to be upwardly mobile (50 percent of whom increased their income by at least a 25 percent), 23 percent of tax units with no change in the number of workers experienced substantial upward mobility. This matches the level of upward mobility for the general population, indicating that the addition of workers to the labor market is not the primary driver of the income mobility observed in table 5. Similarly, even in cases where all individuals in the tax unit remain employed by the same employer, 22 percent experience income gains of at least 25 percentage points.

Tables 8 and 9 display regression results for tax unit income changes analogous to the individual earnings regressions in table 3 and table 4, respectively. Table 8 displays the odds ratios from two logistic regressions on binary variables indicating whether or not a family experienced an income gain or loss in excess of 25 percent. The odds-ratios associated with the five-year age bins (of the primary filer) mostly tell a story consistent with standard notions

Table 5: Income mobility in tax unit income by initial income

INITIAL INCOME QUINTILE							% CHANGE IN		INITIAL SIZE-ADJUSTED INCOME	
	DECLINE >50%	DECLINE 25–50%	DECLINE <25%	INCREASE <25%	INCREASE 25–50%	INCREASE >50%	MEAN INCOME	MEDIAN INCOME	MEAN	MEDIAN
<$1,000	—	—	—	—	—	—	—	—	-$7,600	$0
Lowest	4%	7%	23%	23%	9%	34%	60%	20%	$10,300	$10,600
Second	7%	10%	28%	27%	11%	16%	16%	3%	$21,800	$21,700
Middle	7%	11%	30%	32%	11%	9%	8%	1%	$35,500	$35,500
Fourth	6%	10%	34%	34%	9%	7%	4%	0%	$53,200	$52,500
Highest	11%	14%	32%	28%	8%	7%	-8%	-5%	$147,100	$92,000
All	**7%**	**10%**	**29%**	**29%**	**9%**	**14%**	**2%**	**1%**	**$53,500**	**$35,500**

Note: Income mobility is measured from t to t+2, where t=1999–2009. All dollar amounts adjusted to 2013 values using the CPI-U-RS. Tax unit incomes are size adjusted by dividing income by the square root of the number of people in the tax unit. Tax units with initial income less than $1,000 are removed from the bottom quintile and positive to non-positive positive changes in earnings are considered decreases of at least 50 percent. Tax units are excluded if they have no income in the initial and final years, three-year average incomes less than $5,000, the primary dies during the three-year period, or the primary is 25 years old or younger in the initial year of each three-year period.
Source: Enhanced CWHS panel and authors' calculations

Table 6: Persistence of tax unit income gains and losses

	PERCENT WITH INITIAL SHOCK BY INITIAL INCOME GROUP (FROM T TO T+2)					PERCENT WITH PERSISTENT SHOCK CONDITIONAL ON INITIAL SHOCK (FROM T+2 TO T+4)				
	LOWEST QUINTILE	SECOND QUINTILE	MIDDLE QUINTILE	FOURTH QUINTILE	HIGHEST QUINTILE	LOWEST QUINTILE	SECOND QUINTILE	MIDDLE QUINTILE	FOURTH QUINTILE	HIGHEST QUINTILE
Decline >50%	4%	7%	7%	6%	11%	16%	22%	26%	30%	40%
Increase >50%	35%	17%	9%	7%	7%	45%	39%	32%	26%	22%
Decline >25%	10%	17%	17%	16%	25%	24%	31%	34%	36%	43%
Increase >25%	44%	28%	20%	16%	15%	46%	42%	38%	34%	30%

Note: Initial shocks are measured from t to t+2, and persistent shocks are t+2 to t+4, where t=1999–2007. All dollar amounts are adjusted to 2013 values using the CPI-U-RS. Tax unit incomes are size adjusted by dividing income by the square root of the number of people in the tax unit. Tax units are excluded if they have no income in the initial and final years, three-year average incomes less than $5,000, the primary dies during the three-year period, or the primary is 25 years old or younger in the initial year of each three-year period. Quintiles are set before tax units with initial incomes below $1,000 are dropped.
Source: Enhanced CWHS panel and authors' calculations.

Table 7: Tax unit income volatility by employment and family characteristics

							% CHANGE IN		INITIAL INCOME		
	DECLINE >50%	DECLINE 25–50%	DECLINE <25%	INCREASE <25%	INCREASE 25–50%	INCREASE >50%	MEAN INCOME	MEDIAN INCOME	MEAN	MEDIAN	FRACTION OF TAX UNITS
All stay in job	4%	9%	30%	35%	10%	11%	5%	3%	$55,600	$42,200	44%
Any changes job	11%	14%	22%	21%	11%	20%	2%	2%	$41,000	$29,200	14%
Primary changes industry	13%	14%	20%	19%	11%	24%	2%	3%	$33,800	$23,500	10%
State change	13%	13%	22%	20%	11%	21%	9%	1%	$57,300	$36,900	4%
Unemp. insur: initial yr	12%	14%	23%	21%	11%	19%	–3%	0%	$35,600	$26,400	6%
Unemp. insur: second yr	16%	18%	24%	18%	9%	14%	–12%	–14%	$37,800	$29,000	6%
Unemp. insur: final yr	14%	19%	26%	18%	8%	14%	–7%	–14%	$37,900	$29,300	7%
No change in # of workers	6%	9%	31%	31%	10%	13%	3%	2%	$54,000	$36,300	87%
Add worker	7%	8%	15%	20%	13%	37%	26%	35%	$40,900	$22,500	5%
Drop worker	26%	22%	23%	13%	6%	10%	–24%	–29%	$54,100	$32,900	6%
Single, stays single	8%	10%	30%	28%	9%	15%	2%	2%	$39,000	$26,400	52%
Married, stays married	6%	10%	30%	31%	10%	12%	1%	0%	$72,300	$47,600	42%
Marriage	11%	14%	18%	17%	12%	29%	9%	17%	$50,400	$33,400	3%
Divorce	16%	15%	19%	17%	11%	21%	5%	–7%	$46,000	$31,500	3%
Added first dependent	16%	32%	27%	10%	5%	10%	–22%	–24%	$55,100	$40,000	4%
Added additional deps.	11%	25%	34%	14%	6%	10%	–15%	–18%	$48,200	$34,100	7%

Note: Income mobility is measured from t to t+2, where t=1999–2009. All dollar amounts are adjusted to 2013 values using the CPI-U-RS. Tax unit incomes are size adjusted by dividing income by the square root of the number of people in the tax unit. Tax units are excluded if they have no income in the initial and final years, three-year average incomes less than $5,000, the primary dies during the three-year period, or the primary is 25 years old or younger in the initial year of each three-year period. Positive to non-positive positive changes in earnings are considered decreases of at least 50 percent.

Source: Enhanced CWHS panel and authors' calculations.

Table 8: Regression results for the odds of a 25 percent increase or decrease in tax unit income

VARIABLES	DECREASE 25%	INCREASE 25%
	ODDS RATIO	ODDS RATIO
Age 25–29	1.02	1.41**
Age 30–34	1.03*	1.19**
Age 35–39	1.02	1.09**
Age 40–44	1.00	1.04**
Age 50–54	1.01	0.97*
Age 55–59	1.14**	0.97
Age 60–64	1.34**	1.17**
Age 65–69	1.29**	1.10**
Age >69	1.12**	0.93**
Either filer student initial yr	0.81**	1.49**
Either filer changes jobs	1.57**	1.35**
Unemp. insur: initial yr	1.00	1.36**
Unemp. insur: second yr	1.57**	0.71**
Unemp. insur: final yr	1.53**	0.81**
Either filer retired initial yr	0.81**	0.60**
Either filer retires	2.01**	1.17**
Add one worker	0.87**	2.31**
Drop one worker	5.16**	0.45**
Move to different state	1.47**	1.28**
Diff state & married init yr	1.03	1.01

TABLE 8 CONTINUED ON NEXT PAGE

of life-cycle income patterns. Younger families are more likely to experience large, positive income shocks, while older families are more likely to experience large income losses. After controlling for age, starting income, and other factors, married tax units exhibit greater rates of upward mobility and lower rates of downward mobility than single tax units.

A job change for one or more family members is associated with large positive and negative shocks, but the logistic regression suggests a different relationship between changing jobs and tax unit income than that observed for individual earnings. Similar to the individual earnings regressions, tax units with job changers are more likely to have either a 25 percent increase or decrease in total income. But, unlike individual earnings, the increase in odds of a 25 percent income decline exceeds that for a 25 percent income increase.

TABLE 8 CONTINUED FROM PREVIOUS PAGE

VARIABLES	DECREASE 25%	INCREASE 25%
	ODDS RATIO	ODDS RATIO
Married initial year	0.67**	1.32**
Marriage	0.68**	3.80**
Divorce	3.44**	0.94**
Children: 1st yr	1.08**	0.75**
Added first child	4.96**	0.37**
Added additional children	0.69**	3.85**
Female primary	1.03**	0.96**
CZ avg. wage change	0.97**	1.03**
CZ unemp. rate change	1.05**	0.97**
Control for starting centile	Yes	Yes
Observations used	1,325,727	1,325,727
Fraction decr./incr. 25%	18%	18%

Note: Dependent variables are two-year decreases or increases of at least 25 percent of size-adjusted tax unit income, where non-positive to positive changes in earnings are considered increases of at least 25 percent. Odds ratios of logistic regressions are shown. Income mobility is measured from t to t+2, where t=1999–2009. Observations are removed if primary less than 25 years old in the initial year. The income definition is described in text. Intercept, year dummies, and initial year centile dummies not shown. Ages are based on the primary tax filer, and ages 45–49 are the excluded age group. The fraction with increases or decreases of at least 25 percent differ from table 5 due to inclusion of individuals whose starting income is under $1,000, who were considered separately in table 5.
* denotes significant at 1 percent level.
** denotes significant at 0.1 percent level.
Source: Enhanced CWHS and authors' calculations.

Table 9 mimics the logistic regression specification in table 4, where the arc-percent change in family income is the dependent variable. Once again, in contrast to individual earnings regressions, job changes were associated with a 3 arc-percent decline in family income. Similarly, moving to a different state was associated with a 4 arc-percent decline in family income. These (relatively small) coefficients suggest that income gains by one spouse from a new job are partially counterbalanced by the employment and hours decisions of others in the tax unit.

Since job changes are not a significant driver of upward mobility, who is most upwardly mobile? Those who got married or had a member of the family start working were the most likely to exhibit large income gains. Getting married was associated with a 25 arc-percent increase in their family

Table 9: Regression results for tax unit income mobility from life events

VARIABLES	COEFFICIENT	ARC%. EFF.
Age 25–29	0.02**	3%
Age 30–34	0.01*	1%
Age 35–39	0.00	0%
Age 40–44	0.00	0%
Age 50–54	0.00	0%
Age 55–59	–0.01**	–1%
Age 60–64	–0.01**	–1%
Age 65–69	–0.01*	–1%
Age >69	0.00	0%
Either filer student initial yr	0.09**	9%
Either filer changes jobs	–0.03**	–3%
Unemp. insur: initial yr	0.02**	2%
Unemp. insur: second yr	–0.11**	–11%
Unemp. insur: final yr	–0.05**	–5%
Either filer retired initial yr	–0.04**	–4%
Either filer retires	–0.09**	–9%
Add one worker	0.09**	9%
Drop one worker	–0.47**	–47%
Move to different state	–0.04**	–4%
Diff state & married init yr	0.00	0%

TABLE 9 CONTINUED ON NEXT PAGE

incomes. This is despite the fact that incomes are size-adjusted, which partially counterbalances the income gains reflecting the increase in individuals sharing the family's income. Similarly, having a family member start work was associated with a 9 arc-percent increase in family income. Thus, although there is substantial earnings volatility among tax units that do not experience a change in family or employment circumstances, the fastest way to move up the income ladder is clearly through marriage or transitioning from a single earner family to a dual earner family.

Stabilizing Effects of Federal Income Taxes

While researchers considering cross-sectional income inequality increasingly recognize the importance of taxes and transfers for mitigating income

TABLE 9 CONTINUED FROM PREVIOUS PAGE

VARIABLES	COEFFICIENT	ARC%. EFF.
Married initial year	0.11**	12%
Marriage	0.25**	25%
Divorce	–0.19**	–19%
Children: 1st yr	–0.05**	–5%
Added first child	–0.27**	–27%
Added additional children	0.15**	15%
Female primary	–0.01**	–1%
CZ avg. wage change	–0.01**	–1%
CZ unemp. rate change	–0.02**	–2%
Control for starting centile	Yes	Yes
R-square	0.320	
Root MSE	0.635	
Mean of dep variable	0.020	
Observations used	1,325,727	

Note: Dependent variables are two-year arc-percent changes in tax unit incomes with logistic transformation, as described in the text. Income mobility is measured from t to t+2, where t=1999–2009. The column labeled "Arc% eff." shows the arc-percentage point effect calculated using (((EXP(b)/(1+EXP(b)))*202)–101)*0.02, where b is the coefficient. The income definition is described in text. Observations are removed if less than 25 years old in the initial year. Intercept, year dummies, and initial year centile dummies are not shown. Ages are based on the primary tax filer, and ages 45–49 are the excluded age group.
* denotes significant at 1 percent level.
** denotes significant at 0.1 percent level.
Source: Enhanced CWHS and authors' calculations.

inequality (see e.g., Burkhauser, Larrimore, and Simon 2012), the stabilizing impact of taxes has often been overlooked in previous research on income mobility. The progressive tax rate schedule, as well as the EITC, child tax credit, and Alternative Minimum Tax (AMT), all impact the economic resources available to individuals for consumption. However, they also alter the magnitude of income swings as individuals pass through qualifying income levels for different tax programs.

This section documents the stabilizing and destabilizing effect of federal income taxes based on the extent to which they offset pre-tax income mobility. These stabilization effects are closely tied to effective marginal tax rates, which are impacted by tax rate schedules, the AMT, phase outs or limitation of credits and other benefits (EITC, child and child care credits, savings and education credits, and IRA contributions), and standard deductions and exemptions. Given that almost two-thirds of large income swings over

two years prove to be transitory, any stabilizing impacts can help to mitigate short-term changes. However, some elements of the tax code can also create destabilizing effects and accentuate income changes, such as the phase-in ranges of the EITC and the refundable portion of the child credit, where increases in income decrease tax liabilities.

The stabilizing and destabilizing effects of federal income taxes are measured by the percent of stabilization (PercentStabilization) between pre- and post-tax income changes, where ΔIncome equals final minus initial income:

$$\text{Stabilization} = \Delta\text{Income}_{\text{Pre-Tax}} - \Delta\text{Income}_{\text{Post-Tax}} \quad (2)$$

$$\text{PercentStabilization} = \text{Stabilization}/\Delta\text{Income}_{\text{Pre-Tax}} \quad (3)$$

The percent stabilization is closely tied to effective marginal tax rates, as tax units with higher marginal tax rates will experience greater levels of income stabilization. This marginal tax rate is impacted both by the individual's tax bracket and the phase-in and phase-out of credits and exemptions described previously.

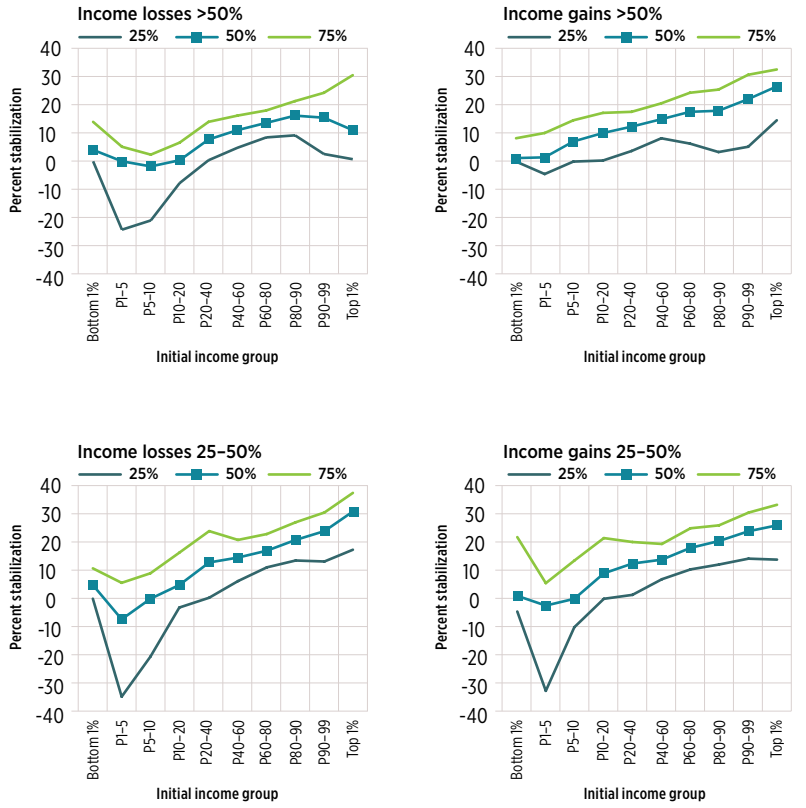
The direction of the income change is important when considering the practical effect of income stabilization from taxes. The stabilizing impact of taxes is a positive feature for tax units experiencing a negative income shock, as the decline in tax liabilities offsets income losses and cushions the decline. However, the reverse is true for positive income shocks, as the increase in tax liabilities offsets income gains.

Estimating Stabilization Effects throughout the Distribution

The four panels of figure 1 measure the stabilizing effects of federal taxes for tax units experiencing large income gains or losses at each starting point in the income distribution. As expected, the percent of income changes offset by tax changes increases for those with higher initial incomes. This is due to progressive tax rates, the AMT, and various phase-outs of tax credits and deductions that increase effective marginal tax rates. For example, tax units in the second decile of the income distribution (p10–p20) experiencing a moderate pre-tax income gain (25–50 percent) have a median stabilization from taxes of 10 percent. However, a similar pre-tax income shock to a tax unit in the top decile is offset (reduced) by approximately 25 percent.

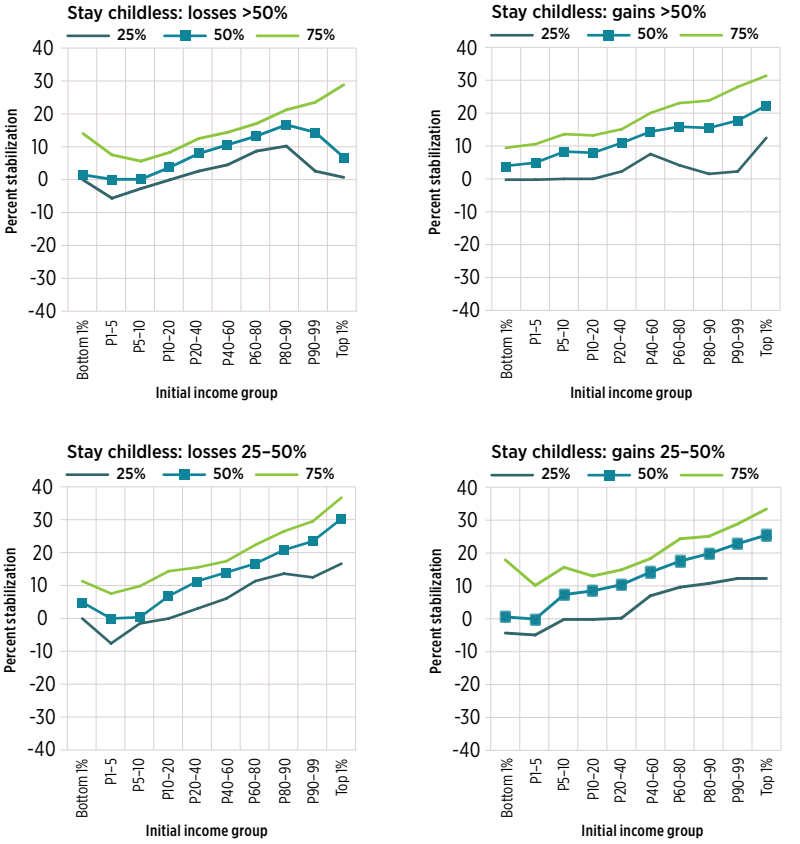
A key asymmetry appears among tax units near the bottom of the income distribution, particularly when looking at the 25th and 75th percentiles of stabilization rather than the median. Among tax units starting in the bottom decile, those with losses in excess of 50 percent of their initial pre-tax income are likely to experience tax destabilization; that is, their losses are accentuated

Figure 1: Stabilization of income from federal income taxes



Note: Percent stabilization is the difference between pre- and post-tax income changes divided by pre-tax income changes. Income gains and losses are two-year pre-tax income changes: t to t+2, where t=1999–2009. Incomes include capital gains and post-tax income subtracts net federal income tax liabilities.
Source: Enhanced CWHS panel and authors' calculations.

Figure 2: Stabilizing effect of federal income taxes by parental status



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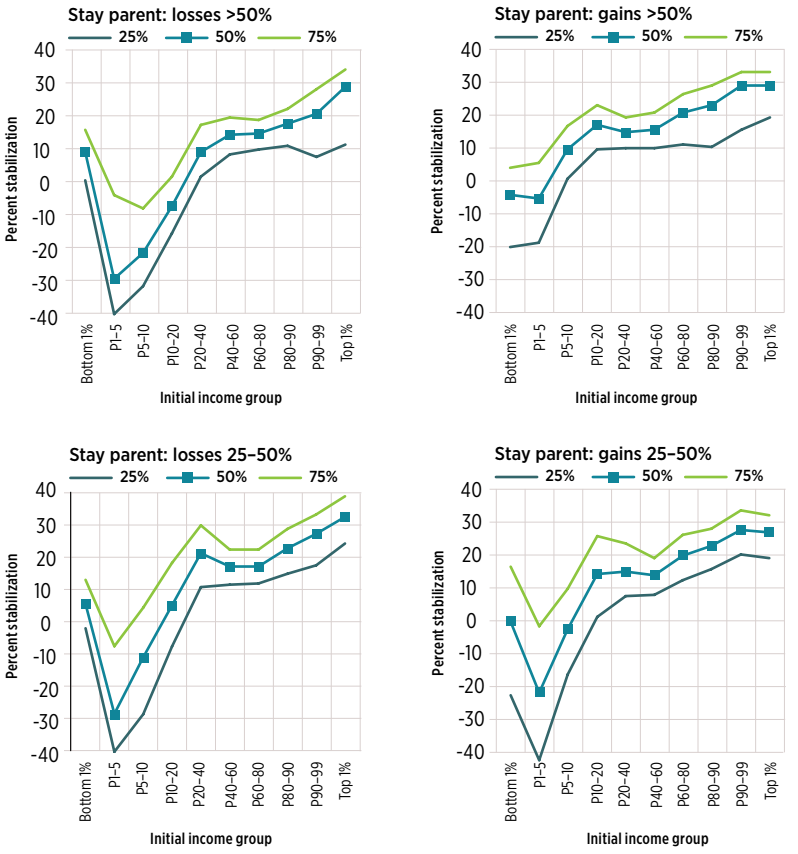

Note: See note to figure 1.
Source: Enhanced CWHS panel and authors' calculations.

by changes to their tax liabilities and credits (top left panel of figure 1). The median tax unit in this range has a slight accentuation of their pre-tax income loss when incorporating taxes, while 25 percent have at least one-fifth of their losses accentuated by taxes. This is because tax units in the phase-in range of the EITC that experience large, negative income shocks often lose their earned income and/or refundable child tax credits, thus exacerbating their market income decline.

In contrast, tax units in the bottom decile whose pre-tax income increases by at least 50 percent are likely to experience relatively modest stabilization from the tax code (top right of figure 1) and their post-tax income will increase by less than their pre-tax income. Unlike tax units in this range with income losses, large gains often increase their incomes to the point that the EITC begins phasing out, thus limiting the tax benefits. From a practical standpoint, this asymmetric relationship presents a challenge for these tax units. If they suffer a negative income shock, the destabilizing effects of taxes magnify the income decline. However, if their market income rises, the stabilizing nature of the EITC phase-out attenuates their post-tax income growth. For moderate-income gains and losses of between 25 and 50 percent (bottom two panels of figure 1), this asymmetry is less apparent.

Estimating Stabilization Effects by Parental Status

Recognizing that much of the deviation from the stabilization generated from the progressive rate schedule is related to credits offered to low- and moderate-income families with children, such as the EITC the child tax credit, the panels of figure 2 separately consider the stabilizing impact of taxes for mobility among families with and without children. The top four panels consider individuals who are childless in both observation years while the bottom four panels consider individuals who are parents in both observation years. This analysis excludes those individuals who added children or whose children age out of their family.

Among childless individuals, taxes almost always stabilize incomes regardless of their point in the income distribution—and this is true both for income gains and income losses. This is consistent with the expected effects of a progressive income tax schedule and the significantly smaller EITC for childless families. However, among parents changes in tax liabilities accentuate both moderate and large income losses for those in the bottom quintile of the income distribution. This is consistent with the findings of Bitler, Hoynes, and Kuka (2014): the EITC may be successful at encouraging work, but it can actually accentuate income losses. Considering income gains, parents who start in the bottom 5 percent of the distribution that experience a moderate income

gain have those gains accentuated by the tax code. However, this tax bonus for income gains dissipates by the second vigintile (p5–p10) and by the second decile taxes return to offsetting most moderate large income gains.

Conclusion

This paper examines a large panel of tax return data, and documents substantial intragenerational income mobility over short time horizons. Almost one half of working adults experience a 25 percent change in their earnings over a two-year period, and almost as many families experience a shift of this magnitude in their family income. However, incomes quickly return to their original level, with only about a third of family incomes persisting at these new levels after a subsequent two years.

Large swings in individual earnings are strongly correlated with job changes, although there is little difference in the level of mobility experienced by those who change jobs within their industry versus those who transition to a new industry. There is some difference in earnings stability by industry, as men and women working in education, healthcare, FIRE, or STEM industries are the most likely to experience 25 percent earnings growth over a two-year period. There also are differences in the relationship between individual earnings and family status by gender, with marriage having a positive impact on earnings mobility for men but not for women.

When considering income more broadly, and focusing on tax units (as opposed to individuals), large income gains are most likely among those that add workers—either through marriage or through a second family member entering the workforce. However, approximately one-quarter of families that maintain the same number of workers still experienced at least a 25 percent increase in income. But downward mobility for those with no change in workers was also quite prevalent, with approximately one-seventh of tax units who had no change in the number of workers experiencing a 25 percent income decline.

For tax units near the bottom of the income distribution, income declines are often exacerbated by the loss of tax credits such as the EITC. One-quarter of tax units starting in the bottom decile that experienced a 50 percent drop in their pre-tax income had their losses accentuated by the tax code resulting in post-tax losses that were larger than pre-tax losses. This suggests that while the EITC and other programs in the tax code may be successful at encouraging work among low-income families, when such families experience economic hardships the loss of these credits can exacerbate an income decline. ■

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