

Why Did So Many Economically Vulnerable Families Enter the Crisis with Risky Balance Sheets?

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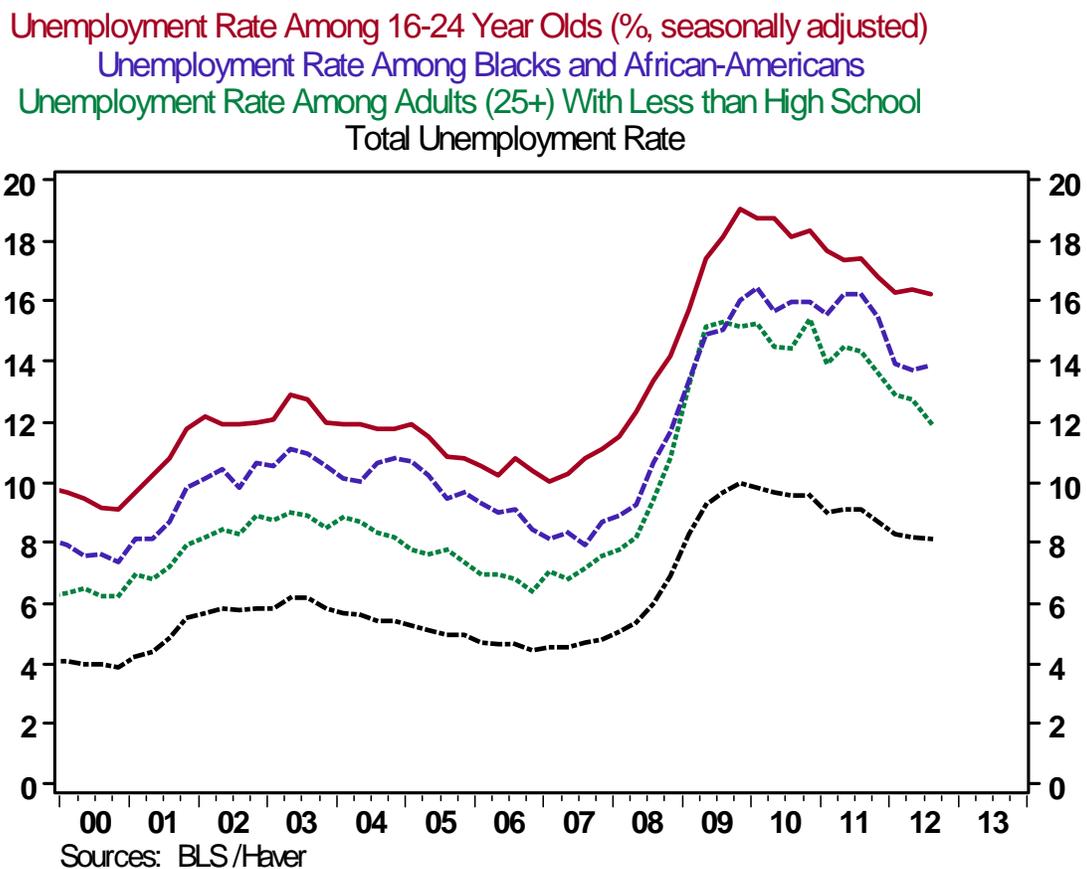
Abstract: Tragically, many families that were most exposed to the economic dislocations of the recent recession also had very risky balance sheets going into it, characterized by low levels of liquid assets, high portfolio concentrations in housing, and relatively high balance-sheet leverage. We argue that economic vulnerability and risky balance sheets are correlated in the population because they derive from common factors. These include a low stock of human capital, inexperience (relative youth), and, in some cases, the legacy of discrimination in housing, education, and employment. Innate cognitive ability interacts with formal education and on-the-job experience to build human capital, while the legacy of discrimination may attenuate the translation of cognitive ability and education into human capital. Financial knowledge of how to manage risk also requires time and experience to accumulate and is more valuable to those with high levels of human capital and savings available to invest. Putting these pieces together, individuals and families that are young, less cognitively able, and/or members of historically disadvantaged minorities are more likely to be both economically vulnerable and hold risky balance sheets due to low financial knowledge. Moreover, balance sheets of economically vulnerable families before the recent recession were especially risky after a decade of financial liberalization and innovation that had increased the access of those financially less sophisticated families to homeownership and historically high leverage. To enhance household financial stability in the future, economically vulnerable families should avoid “doubling down” with risky balance sheets.

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Why Did So Many Economically Vulnerable Families Enter the Crisis with Risky Balance Sheets?

The recent financial crisis and recession inflicted substantial economic and financial harm on millions of families, but the effects were not uniform across the population. The hardest-hit groups included individuals or families that were either young, less-educated, members of a minority group, or who possessed more than one of these characteristics. Unemployment rates among all of these groups increased sharply and remain elevated more than three years into the recovery (Figure 1).¹

Figure 1



Source: Bureau of Labor Statistics.

¹ Hoynes, Miller and Schaller (2012) find that men, African-Americans, Hispanics, young people, and those with low levels of education suffered the most job-market dislocations during the recent recession. These patterns were virtually unchanged from previous recessions at least as far back as 1979. The proximate cause of extreme cyclical sensitivity of workers with these demographic characteristics was the mix of industries and occupations they tend to inhabit, including construction and manufacturing sectors and associated job categories.

These economically vulnerable groups also suffered greatly in financial terms. For example, the average wealth among individuals or families that were young (under 40), college-educated (2- or 4-year degree), and members of an historically disadvantaged minority (African-American or Hispanic) was \$33,154 in 2010, some 66 percent lower than the average for this group in 2007.² The average wealth in 2010 among individuals or families headed by someone who was young, had less than a high-school education, and was not a member of an historically disadvantaged minority (primarily white or Asian) was \$22,008, a huge 74 percent lower than the 2007 average for this group. Most other subgroups with one or more of these demographic characteristics also suffered above-average wealth losses.³

Why did demographic groups that were hardest hit by the recession also suffer enormous financial losses? The answer is not as obvious as it might at first appear. Economic and financial cross-currents—including rising unemployment, falling asset prices, and different wealth-accumulation patterns—affected different households in different ways. Households at greater *ex ante* risk of job loss and other economic setbacks—the economically vulnerable—indeed suffered more unemployment spells and other interruption of income than other groups.⁴ On the other hand, these same households presumably knew they were at greater risk of job loss than other families. They might have had higher precautionary saving and chosen relatively safe balance sheets to compensate for elevated economic risk.⁵ This would imply relatively high saving propensities; large stocks of safe and liquid assets relative to income to respond to emergencies; a broadly diversified asset portfolio to hedge against the collapse

² Data are from the Federal Reserve's Survey of Consumer Finances and are adjusted for inflation.

³ The average inflation-adjusted wealth loss among all families between 2007 and 2010 was 15 percent, according to the Survey of Consumer Finances. The median loss was 39 percent. See Emmons and Noeth (2012) and Bricker et al (2012).

⁴ Hur (2012) provides evidence of large losses of labor income and net wealth along with declines in consumption among young families during the recession.

⁵ There is a large literature in Finance that explores the trade-off between income risk and portfolio risk. Heaton and Lucas (2000) found that households with high and variable business income hold less wealth in stocks than other similarly wealthy households. Similarly for non-entrepreneurs, holding stock in the firm where one works reduces the portfolio share of other common stocks.

of any asset class; and low balance-sheet leverage (i.e., debt-to-assets ratio) to minimize both the amplification of asset-price declines on net worth and the risk of defaulting on a debt.

Moreover, economically vulnerable families generally have relatively low permanent incomes and low wealth-to-income ratios.⁶ Because they held comparatively little wealth before the crisis, their total lifetime resources presumably were less affected by asset-price declines. Older, more highly educated, and non-minority families, by way of contrast, typically had vastly more wealth and larger shares of their lifetime resources at risk in financial and housing markets. After the trauma of 2008-09, large declines in asset prices presented an unusually favorable opportunity for families that had relatively low exposure to these markets before the crisis to accumulate assets at bargain prices. Extremely low interest rates in the aftermath of the crisis likewise could be especially valuable to struggling families that wanted to refinance existing debt or take on new borrowings to buy a house, pay for education or training, or start a new business.

It is therefore not obvious why economically vulnerable groups of families experienced such large percentage wealth losses. It turns out that economically vulnerable families also typically exhibited risky financial behavior and had risky balance sheets going into the crisis. In particular, young, less-educated, and minority families had saving propensities significantly lower than their older, better-educated, and non-minority counterparts.⁷ Their homeownership rates had increased by above-average amounts in the decade prior to the crisis and their share of housing in total assets was higher than for

⁶ See Dynan, Skinner, and Zeldes (2004).

⁷ For example, only 49 percent of young high-school drop-out minority individuals or families reported saving anything in the year prior to being surveyed in 2007 in the Survey of Consumer Finances. Only 40 percent of young high-school drop-out non-minority households saved. The population average was 56 percent.

economically less vulnerable families.⁸ Balance-sheet leverage and debt-to-income ratios were higher and had increased more in the years leading up to the Great Recession.⁹

These families' huge wealth declines during the crisis, as well as their apparently limited ability to take advantage of low asset prices and interest rates in 2009 and 2010, followed directly from the balance sheets they took into the crisis. Rather than providing a bulwark against the economic storm, many economically vulnerable families' balance sheets collapsed at the same time as their earnings from work declined or vanished.

Based on the work of Lusardi, Michaud, and Mitchell (2013), we provide a framework for understanding why so many economically vulnerable families entered the recession with very risky balance sheets in Section 1. This approach does not rely on differing rates of time preference or risk aversion to generate differences in behavior toward financial risk. Instead, the key insights are that financial knowledge is costly, takes time to acquire, and is of greater value to families with greater anticipated earning power during the middle years of their life spans that they would like to shift forward into retirement. Section 2 documents the heterogeneity of balance sheets in 2007 across the demographic dimensions of age, educational attainment, and race or ethnicity, emphasizing the riskiness of the average balance sheet among economically vulnerable groups. In Section 3, we show the financial results of holding risky balance sheets during the Great Recession. We provide regression evidence in Section 4 that helps us determine the relative importance of demographic factors in driving risky portfolio choice. We find that relative youth, perhaps more than any other factor, explains risky financial behavior before the crisis and ensuing large wealth losses. Section 5 concludes with a discussion of commonly proposed intervention strategies that attempt to break the link between economic vulnerability and financial fragility.

⁸ See Emmons and Noeth (2013).

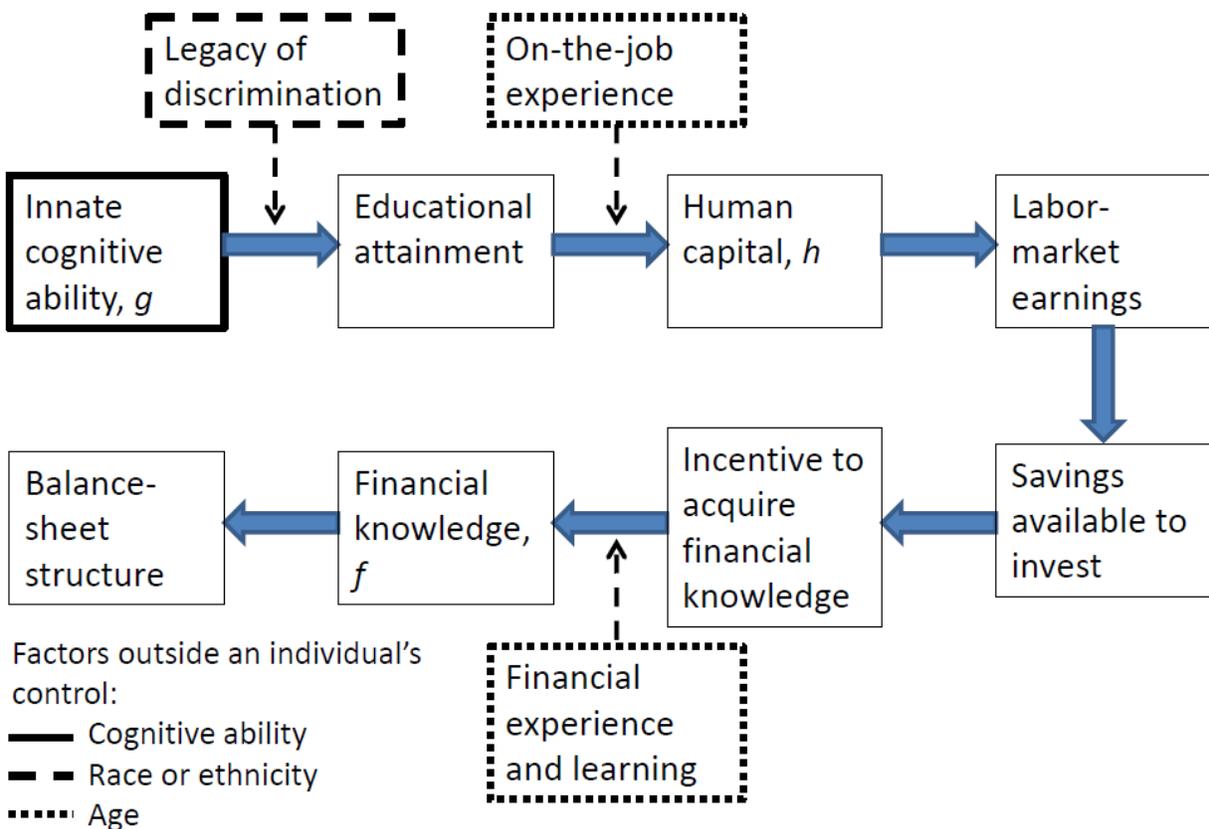
⁹ Ibid.

1. A framework for understanding the link between economic vulnerability and risky balance sheets

Figure 2 sketches our framework connecting a family’s endowments (cognitive, social, chronological) and its economic and financial outcomes. To motivate our subsequent examination of balance sheets and net-worth changes during the Great Recession, we describe in turn how educational attainment, race and/or ethnicity, and age combine to help determine earnings and influence balance-sheet choice.

Figure 2

Earnings Determination and Balance-Sheet Choice



The role of cognitive ability and educational attainment. An individual or family head (henceforth, family) is born with some innate cognitive ability, which might be approximated by a score, g , on a measure of general intelligence. The family's endowment of g is an important but not exclusive determinant of its educational attainment; a variety of individual and social factors also play a role.

The role of race and/or ethnicity. We believe it is critical to highlight the potential importance of race and/or ethnicity in determining a family's educational attainment and all of the subsequent economic and financial outcomes it will experience. We summarize race- or ethnicity-based influences on educational attainment in the concept of a legacy of discrimination. Although overt discrimination in housing, education, employment and other spheres may be less evident today, discrimination and unfair treatment and access in the past leave an unmistakable imprint on people alive today.¹⁰

The evidence for at least a legacy of discrimination is overwhelming. The raw high-school graduation-rate gap between black and white men, for example, is estimated at about 15 percentage points (Murnane, 2013). Even after accounting for differences in family income, grade-eight attendance, and the child's score on an eighth-grade mathematics test, Murnane finds that a 4.3 percentage-point gap remains; and, of course, these controls themselves may embody past discrimination. The three control variables eliminate the graduation-rate gap between black and white women, but they explain even less of the gaps for Hispanic men and women relative to their white counterparts. Those graduation-rate gaps remain 9.1 percentage points for Hispanic men and 4.7 percentage points for Hispanic women even after controlling for family income, eighth-grade attendance, and eighth-grade math scores.

If the legacy of discrimination somehow attenuates the translation of innate cognitive ability into formal educational attainment, minority status may show up as a significant predictor of differential

¹⁰ There is strong evidence that discrimination continues today. Bertrand and Mullainathan (2004) provide recent evidence of labor-market discrimination against black job applicants.

economic and financial outcomes at every subsequent stage in the chain we propose in Figure 2. Not only will the fraction of people who have attained a particular degree status differ across racial and ethnic groups, but the quality of the education obtained also may differ systematically. The positive impact of on-the-job experience may be less for minorities, resulting in a smaller increment to their stock of human capital, h , and potential labor-market earnings.

The role of age. Just as no one chooses one's cognitive ability or race or ethnicity, we cannot choose to be a different age than the one we are at a given time. Figure 2 suggests that age—in particular, being young—is potentially an important determinant of both economic vulnerability and financial fragility.

In the upper half of Figure 2, job experience combines with innate ability and formal education and training—possibly attenuated by the legacy of discrimination—to augment a family's stock of human capital, h . Clearly, on-the-job experience takes time. A younger worker has had less time to build human capital and therefore may be less valuable to an employer in tough times. As shown in Figure 1, the unemployment rate among workers under 25 remains more than double the overall rate. Although close to the overall rate, the unemployment rate among workers aged 25-34 also is higher than for workers 35 or more years old.

The second place where age is a critical determinant of outcomes in Figure 2 is where it influences balance-sheet choice; again, being young is an inherent disadvantage. To see this, consider the lower half of Figure 2.

The first step is to recognize that, the higher a family's labor-market earnings, the more likely the time path of its earnings will be hump-shaped.¹¹ This is due both to labor-market features, including the interaction of aging with pay for performance, as well as social-insurance arrangements (Social

¹¹ The discussion in this section follows the arguments in Lusardi, Michaud, and Mitchell (2013).

Security and Medicare), which entail a significant degree of progressivity. Taken together, workers with higher levels of human capital are more likely to have high earnings that arrive primarily in middle age. Anticipating a subsequent decline in earnings, these workers seek to shift some of their wealth from middle age into their retirement years through private saving, pension, and insurance arrangements. The key point is that these families have relatively strong incentives to acquire financial knowledge—the stock of which we summarize as an index level, f —so they can shift wealth into the future efficiently. Evidence suggests that acquiring financial knowledge requires time—both to study and to learn by doing—and money. Financial planners and attorneys can be expensive, for example.

Lower-income workers, who do not face as much future decline in their earnings—both because they did not receive large pay-for-performance bonuses in their peak-productivity years and because they will benefit from progressive social-insurance schemes—have less incentive to acquire financial knowledge. If the cost of raising their stock of f is sufficiently high, it may be rational to choose *not* to invest in financial knowledge acquisition.

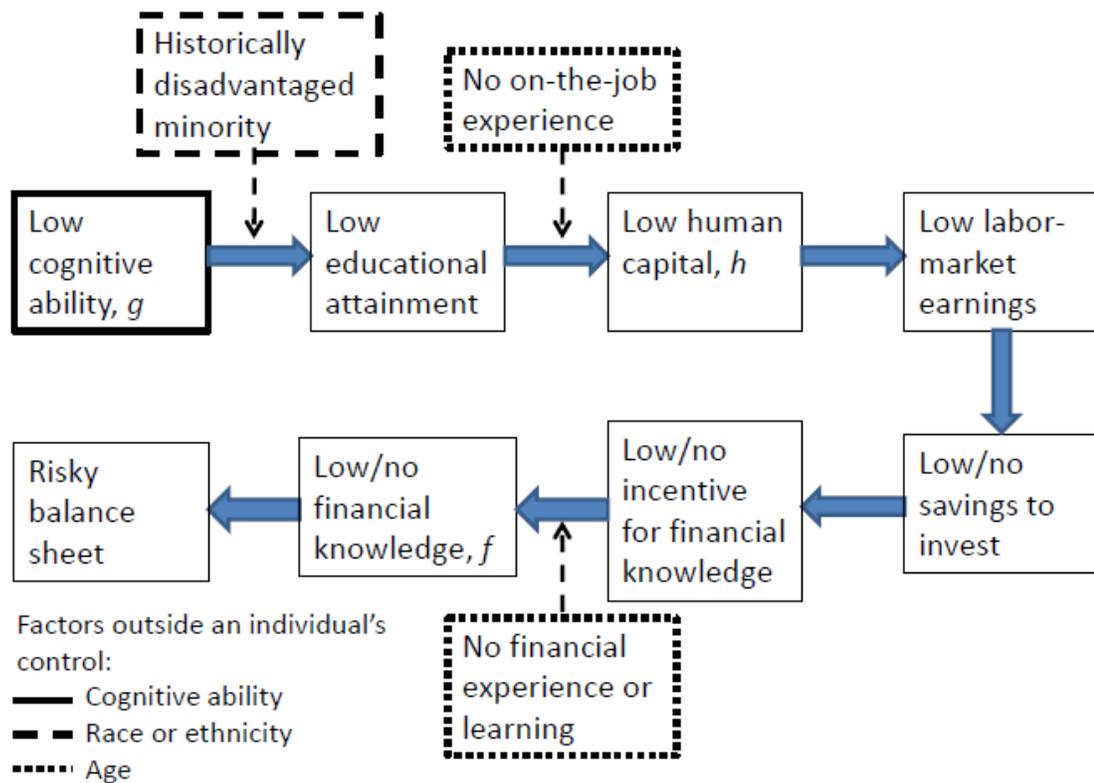
The final link in the chain of Figure 2 is using financial knowledge to shape financial behavior and choose a balance sheet. Families with high values of f —who are more likely also to have high values of h , as just discussed—are more likely to engage in sound financial decision-making, including saving regularly, maintaining an emergency fund of safe and liquid assets, avoiding wealth-depleting financial services, choosing a diversified asset mix with a relatively high risk-adjusted expected return, and using debt conservatively and for specific, investment-like purposes such as buying a car or home or paying the tuition for a child's education.

Thus, we have demonstrated that families likely to be economically vulnerable—in essence, those with relatively low levels of human capital, h , and/or those who are young—also are likely to have poorly constructed, unnecessarily risky balance sheets because they have relatively low levels of

financial knowledge, f . Figure 3 illustrates the “three strikes” that a young minority family headed by someone with less than a high-school education faces. Low human capital is compounded by little on-the-job experience (being young) and little or no financial experience or incentive to gain financial knowledge. The results include low earnings, high earnings volatility (not derived here but commonly associated with low earnings in practice), and a risky balance sheet.

Figure 3

A Young Minority Family with Less than High-School Education



Note that we did not assume any direct link between the level of cognitive ability or human capital and the *efficiency* of acquiring financial knowledge. In other words, even if—as we assume—increasing one’s stock of f takes the same amount of time and money, regardless of the stock of h , those families with higher h will tend to have higher f , as we described. If instead we assume that having high

cognitive ability and/or high h makes acquiring a high f easier, cheaper, or faster, then the link between economic vulnerability and risky balance sheets would be even stronger. In that case, high- h families would have both a stronger incentive to acquire financial knowledge and a more efficient technology for doing so. Families with low cognitive ability and/or low human capital would find it even more difficult to obtain financial knowledge were they so inclined to pursue it.

In sum, we argue that economic vulnerability and risky balance sheets are correlated across families because they derive from common causes. Observationally, economically vulnerable and financially fragile families therefore are more likely to be:

- Young, because they have not had as much time to accumulate on-the-job experience to increase their stock of h , or to augment their stock of financial knowledge, f ;
- Less-educated, because families with a low stock of innate cognitive ability, g , are less able to obtain a given level or quality of education, which reduces h , and ultimately, f ; and
- A minority, because the legacy of discrimination is likely to reduce educational attainment, in turn reducing h and ultimately f .

2. Balance sheets before the crisis

Younger, less-educated, and minority families were known before the crisis to be among the most economically vulnerable groups. Differences in financial behavior and balance-sheet composition were perhaps less well-recognized or understood. We show here that economically vulnerable families generally had risky balance sheets, as well.

18 demographically defined subgroups. Data from the Survey of Consumer Finances reveal systematic differences in the average balance-sheet composition of different family groups before the

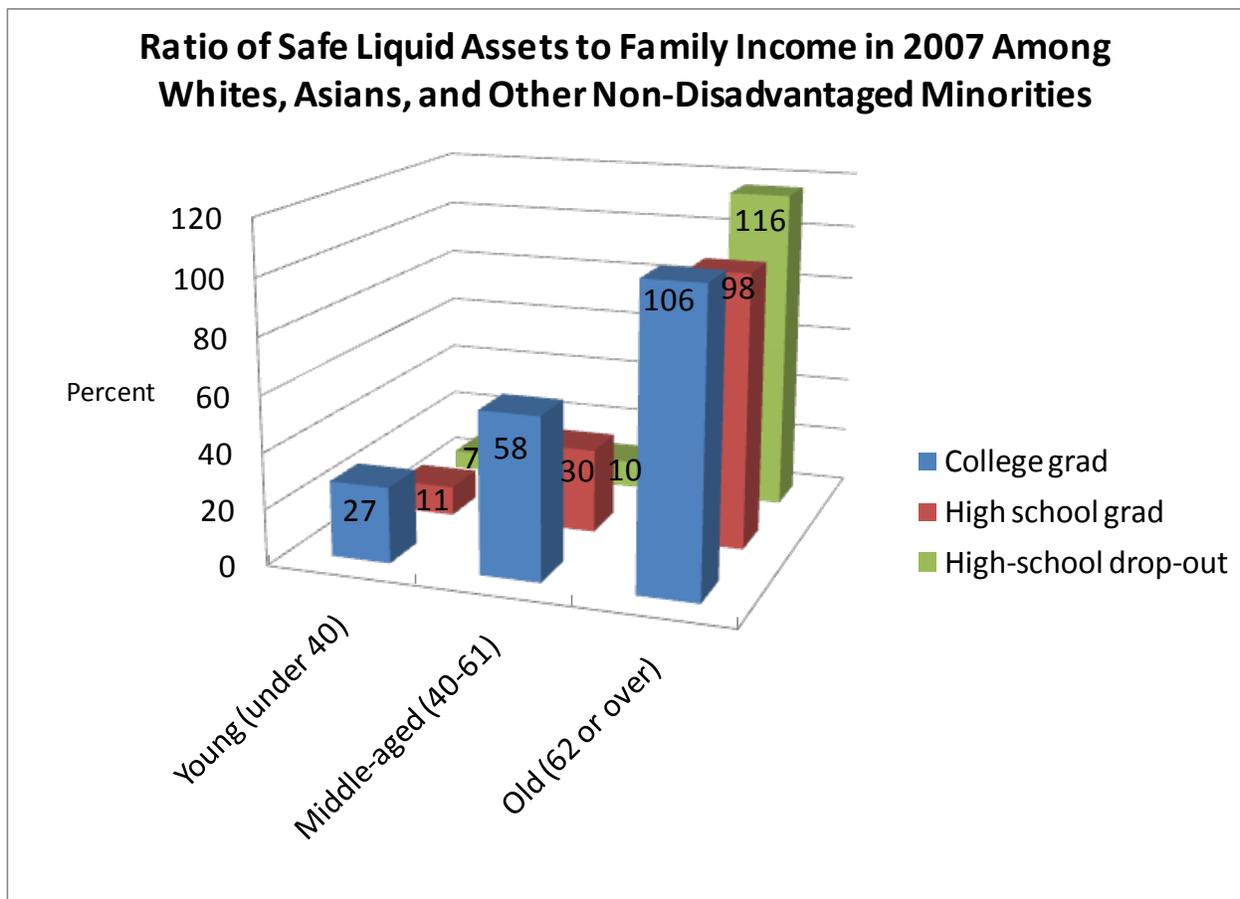
crisis. We define 18 subgroups based on the characteristics of the head of the household (in the case of age and educational attainment) or the person interviewed, if that is a different person (in the case of race or ethnicity), along the following dimensions:

- Age:
 - Family head is under 40 years of age (henceforth, “young”);
 - Family head is at least 40 but less than 62 years old (henceforth, “middle-aged”); or
 - Family head is 62 years of age or older (henceforth, “old”).
- Educational attainment:
 - Family head has received either a two-year or a four-year college degree (henceforth, “college grad”);
 - Family head has received either a high-school diploma or a General Educational Development (GED) certificate (henceforth, “high-school grad”); or
 - Family head has not received a college degree, high-school diploma or a GED certificate (henceforth, “high-school drop-out”).
- Race and/or ethnicity:
 - Respondent is a member of an historically disadvantaged minorities, in which the interviewee is African-American or Hispanic of any race (henceforth, “minorities”);
 - Respondent is white non-Hispanic, of Asian descent, or belongs to another minority group not included elsewhere (henceforth, “non-minorities”).

Safe and liquid assets in 2007. A basic purpose of holding assets is to provide a buffer against shocks to labor-market earnings to allow smoothing of consumption spending. Indeed, precautionary saving is just as important as life-cycle saving in some respects. A simple measure of the adequacy of precautionary saving is the ratio of safe and liquid assets to annual family income.

Figures 4 and 5 show safe-assets-to-income ratios in 2007 among non-minority and minority families, respectively. The most obvious pattern in Figure 4 is that old non-minority families hold much larger precautionary balances than do middle-aged or, especially, young families. The second pattern is less clear; more highly educated non-minority families generally hold more liquid assets than do less-educated families but not in every case. The exception is among old high-school drop-out families. Overall, however, the predictions from Section 1 are confirmed—non-minority families that are more economically vulnerable (younger and less well-educated) tend to have riskier balance sheets in terms of safe and liquid asset holdings.

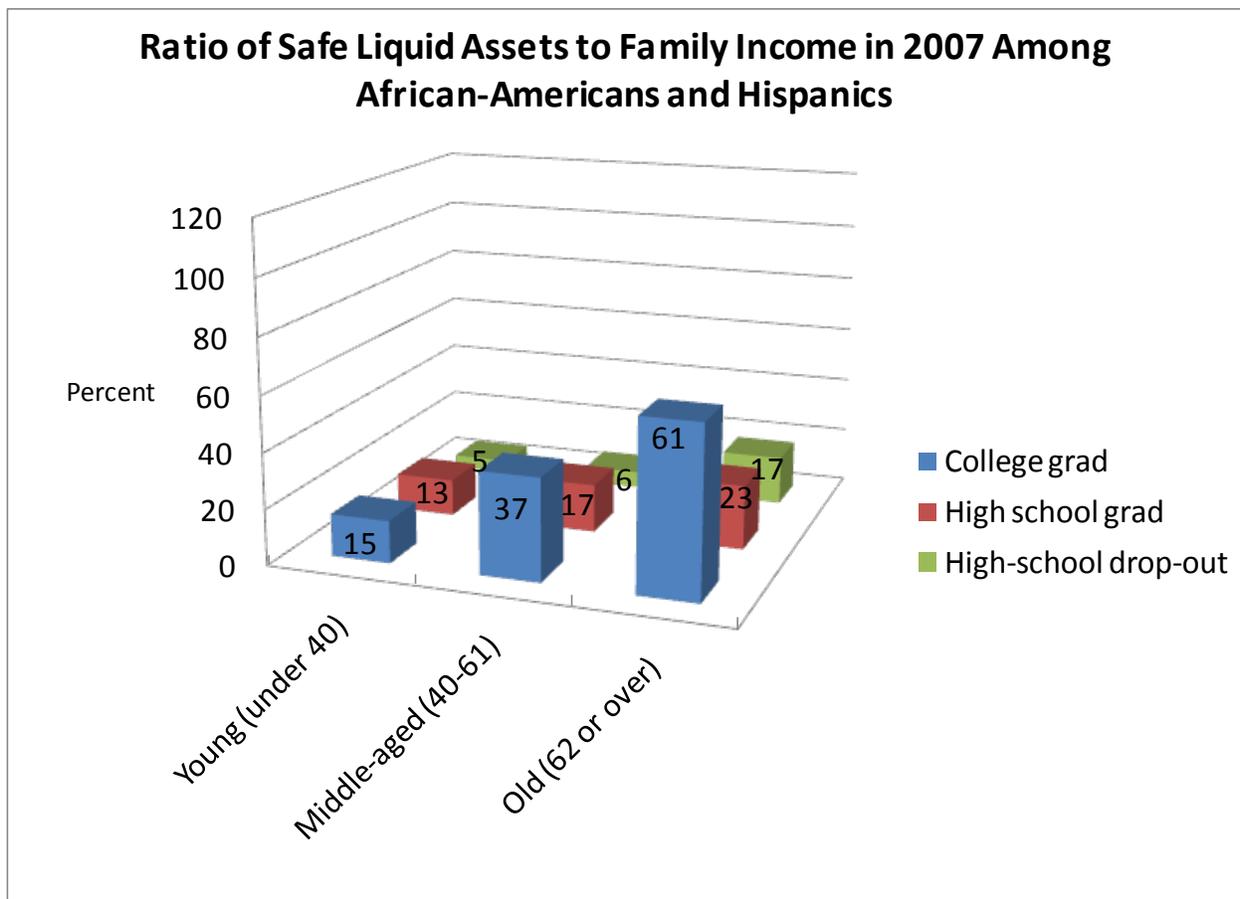
Figure 4



Source: Federal Reserve Board.

Figure 5 shows the ratios of safe and liquid assets to family income among minority families in 2007. The levels in Figure 5 are universally lower than those in Figure 4 for the corresponding group, confirming the prediction that the more economically vulnerable group—minorities—would hold riskier balance sheets. Qualitatively, Figures 4 and 5 tell the same story. The greater the degree of economic vulnerability, the lower the ratio of safe and liquid assets to family income. Although it is not possible to say for sure what a minimum acceptable ratio would be, a commonly suggested rule-of-thumb to hold six months of income in an emergency fund (corresponding to 50 percent in the figures) is violated by all but one minority group and by five of the nine non-minority groups.

Figure 5



Source: Federal Reserve Board.

Residential real-estate portfolio shares in 2007. In principal, we might look for concentrations in any risky asset to ascertain whether portfolio diversification is being followed. Instead, we focus on housing portfolio shares. To be sure, there is an element of hindsight bias involved, as we know now that housing performed particularly poorly. However, we would make the argument that concentrations in residential real estate were particularly risky because housing had been a relatively poor investment from a risk-return perspective for a long time before the crash.

Should one have known before the recent collapse of the housing market that residential real estate was a low-return, high-risk asset class over the long term? We would argue the answer is yes. Even before the housing bubble burst, historical data suggested that residential real estate generally provides moderate returns just a bit above inflation and on a par with liquid assets and non-home real estate. Financial and pension assets have provided significantly higher returns over long periods of time. Moreover, an individual home entails significant idiosyncratic risk associated with the homeowner's region of the country, county, town, and even neighborhood.

To economists, the primary benefit of owning a home is not large capital gains, but rather, to avoid the risk of future rent increases and, in some places, to obtain housing services that are not readily available to rent. Housing is more like a durable good than a financial asset.¹²

Tables 1 and 2 reproduce and extend a summary of annualized rates of return for five asset classes between 1983 and 2010, as well as in several sub-periods (Wolff, 2012). The only exception to the general rule that residential real estate is a relatively low-return asset class among the periods shown here is 2001-07, which most now agree was a bubble.

¹² More specifically, a house is a long-lived durable good that requires substantial maintenance and tax payments; the land on which it sits is an investment asset that tends to appreciate at about the rate of overall economic growth in its region. The low overall return on housing thus is a composite return blending the declining value of the structure and the slowly appreciating value of the land underneath it.

Thus, one could (should) have known that housing was a low-return asset class, even if it was not well-appreciated that it also was a very risky asset class. Yet, local and regional housing-market downturns in recent decades had demonstrated that area-average house prices can, in fact, fall double-digit percentages in relatively short periods of time. So it is plausible to claim that housing was known to be—or should have been known to be—an asset class with a relatively low risk-adjusted expected return.¹³

Table 1
Rates of Return By Asset Type and Time Period, 1983-2010

Asset type	Average annualized percent return (nominal terms)									
	1)		2)		3)		4)		Total	
	1983-89	Rank	1989-2001	Rank	2001-07	Rank	2007-10	Rank	1983-2010	Rank
Financial assets, including stocks	13.3	1	13.0	1	2.3	5	-2.2	2	9.0	1
Pension accounts	6.1	3	8.6	2	4.9	3	-2.5	3	6.0	2
Liquid assets	6.7	2	4.7	3	3.1	4	1.3	1	4.4	3
Business + Non-home real est.	3.9	5	4.1	5	9.8	1	-7.3	5	4.1	4
Residential real estate	4.0	4	4.5	4	5.8	2	-7.2	4	3.4	5
<i>Note: Inflation (CPI-U)</i>	3.7		3.0		2.7		1.7		3.0	

Source: Wolff (2012), Appendix Table 1.

¹³ Another piece of suggestive evidence pointing toward this judgment is that, when all families in the SCF are ranked from lowest to highest net worth, the housing share of assets declines nearly monotonically toward zero. In other words, housing plays a vanishingly small role in the portfolios of the wealthiest and presumably financially savviest families. The same is true of balance-sheet leverage—it declines toward zero as wealth increases in the cross-section.

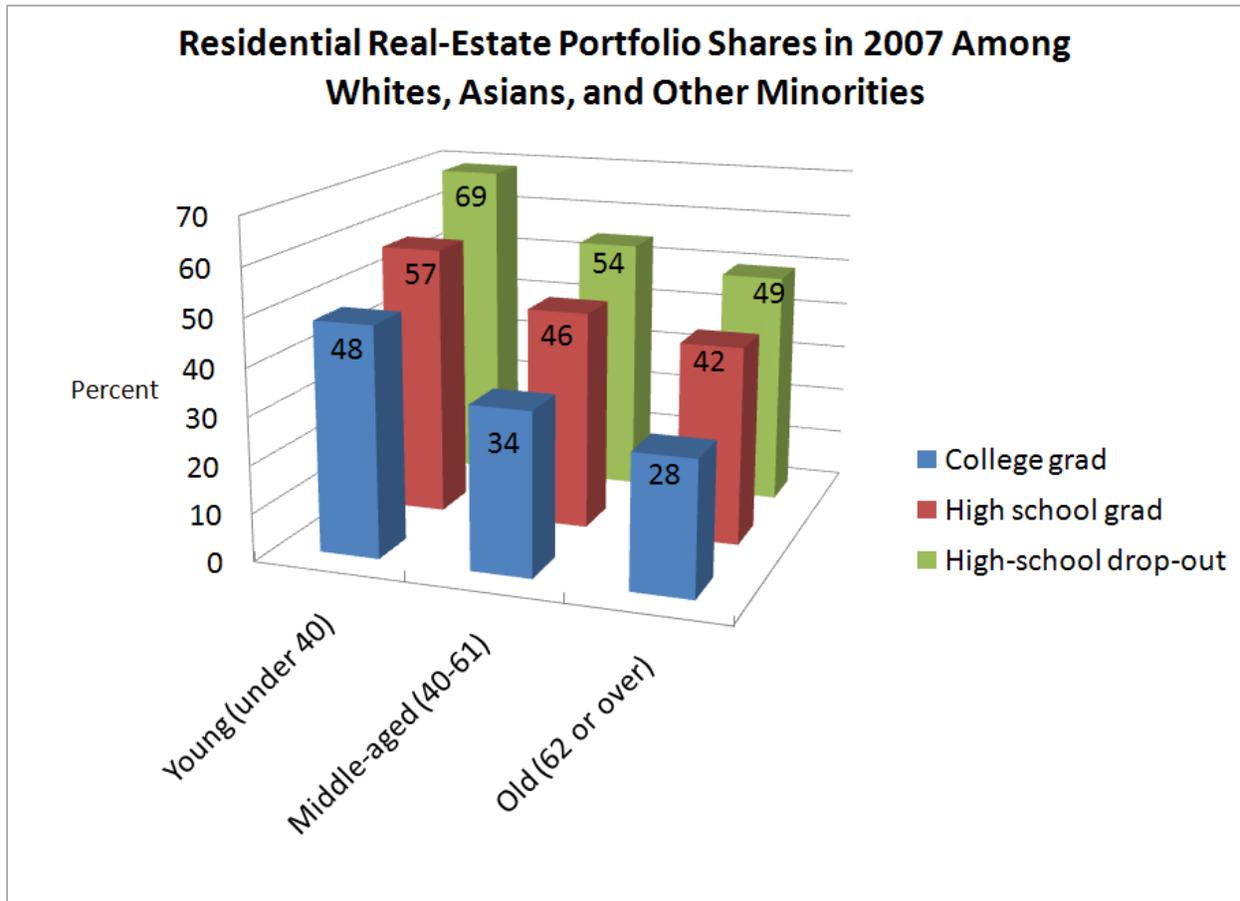
Table 2
Rates of Return By Asset Type, 1983-2001 and 1983-2007

Asset type	Average annualized percent return (nominal terms)			
	1983-2001	Rank	1983-2007	Rank
Financial assets, including stocks	13.1	1	10.3	1
Pension accounts	11.8	2	7.0	2
Liquid assets	4.0	5	4.8	4
Business plus Non-home real estate	5.4	3	5.4	3
Residential real estate	4.3	4	4.7	5
<i>Note: Inflation (CPI-U)</i>	3.2		3.1	

Source: Own calculations based on Wolff (2012), Appendix Table 1.

Figure 6 shows the average share of total assets held in the form of residential real estate in 2007 by each of the nine non-minority subgroups defined above; Figure 7 shows the nine minority subgroups. Among non-minority families, the pattern of asset concentration in housing along both age and educational-attainment dimensions is remarkably clear. The younger the family and the lower the level of educational attainment—that is, the more economically vulnerable the family—the higher the average housing concentration is. The difference in housing portfolio shares between the economically strongest subgroup (old college-educated families) and the economically weakest (young high-school drop-outs) is an enormous 41 percentage points, making the latter group much more vulnerable to a housing-market decline. Considering that the homeownership rate in this group is considerably lower than in the former, the average real-estate share in total assets is even more striking.

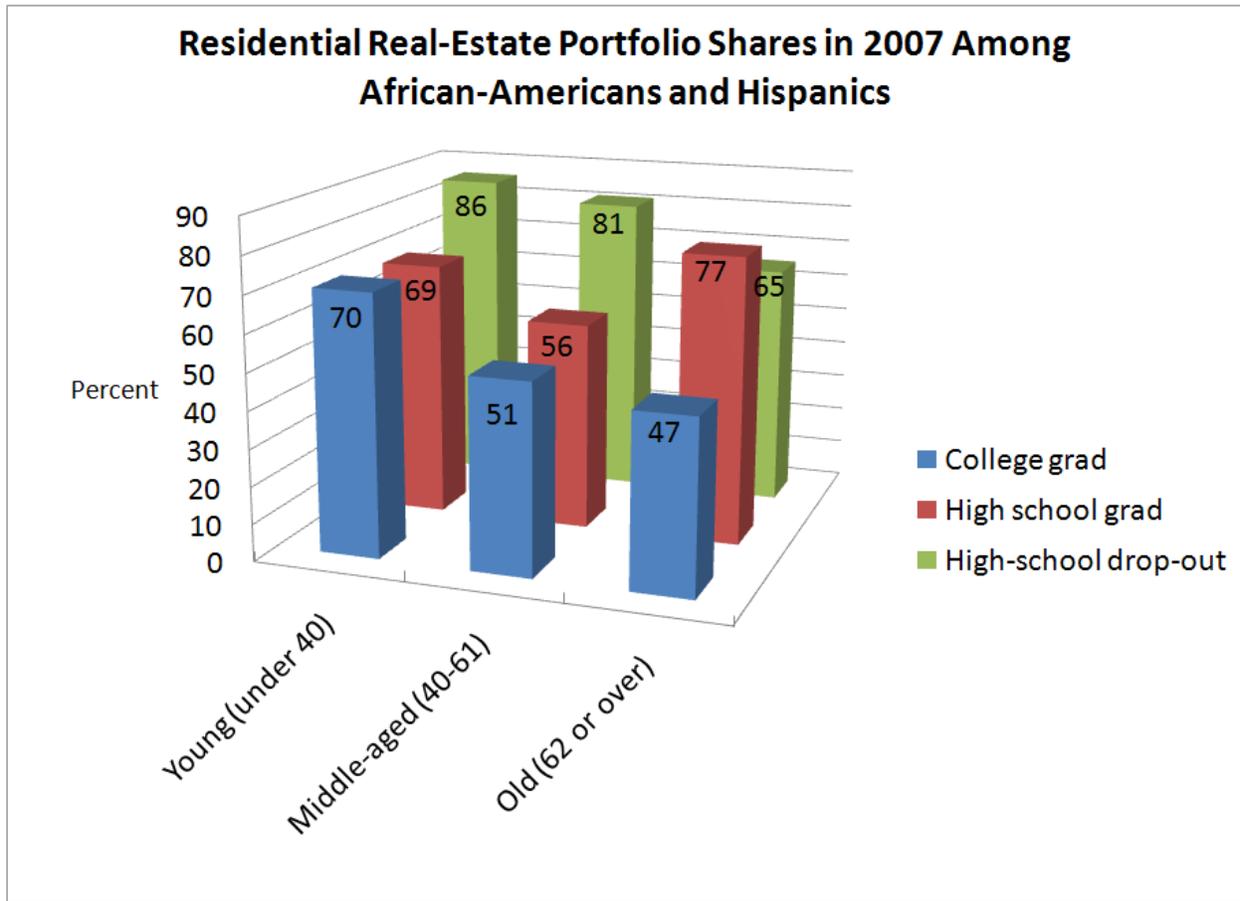
Figure 6



Source: Federal Reserve Board.

The pattern of average minority portfolio concentrations in housing is very similar to that for non-minorities, albeit at uniformly higher levels (Figure 7). With a few slight exceptions, the general principles enunciated above hold here, too. The younger and the less-educated the family, the higher the average portfolio concentration in housing. Comparing Figures 6 and 7, it is clear that the third dimension of economic vulnerability—being a member of an historically disadvantaged minority—also is strongly predictive of a relatively high exposure to housing risk.

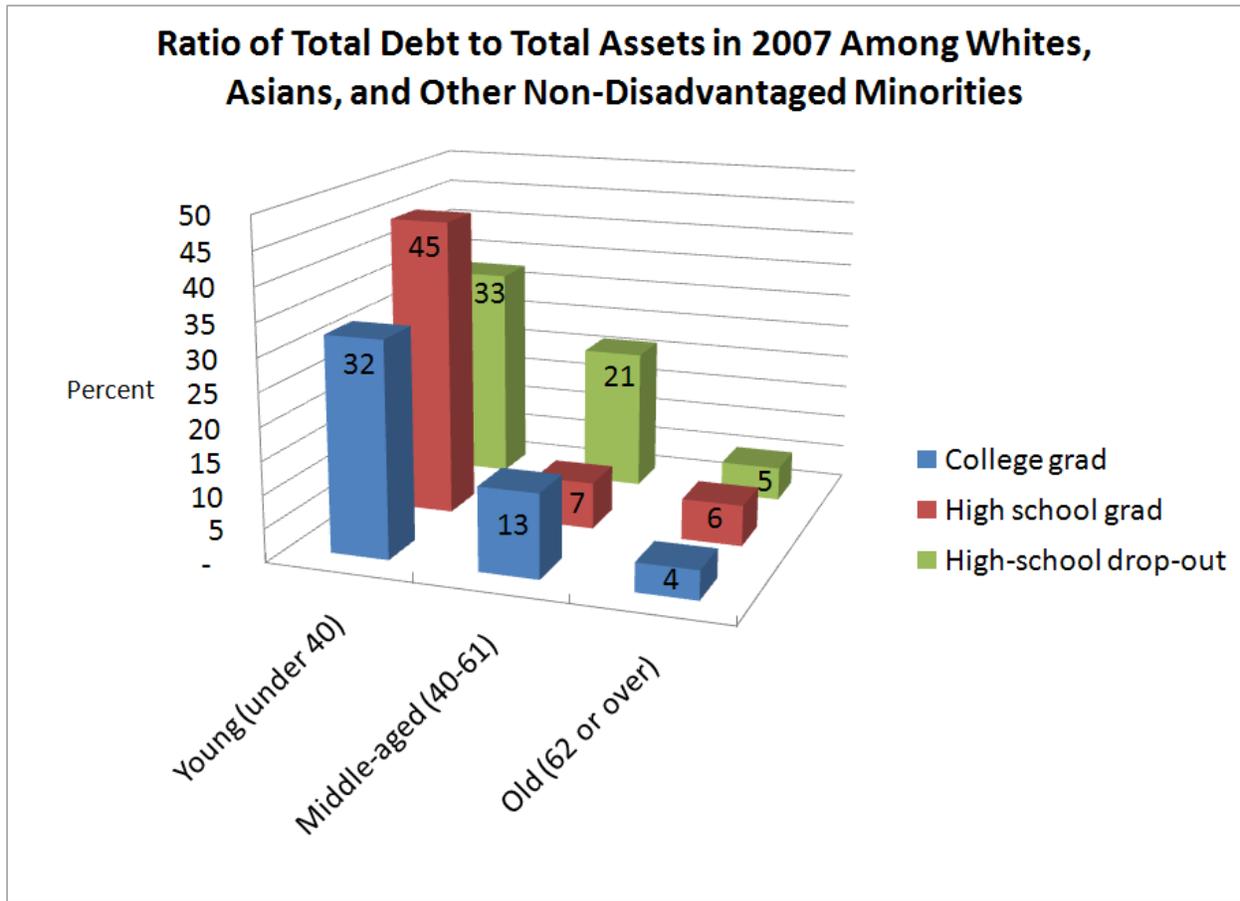
Figure 7



Source: Federal Reserve Board.

Ratio of total debt to total assets in 2007. A high concentration in housing need not lead to financial distress in a housing-market crash if the owner has sufficient net assets (including homeowners' equity) and free cash flow after debt service to meet other needs. The SCF data reveal that, rather than buffering those economically vulnerable families with high housing concentrations against a housing downturn, the liability side of their balance sheets generally tended to amplify the shocks. That is, among the subgroups we consider, those that are economically most vulnerable have, on average, the highest concentrations in housing and the most debt, whether it is measured against assets or income.

Figure 8



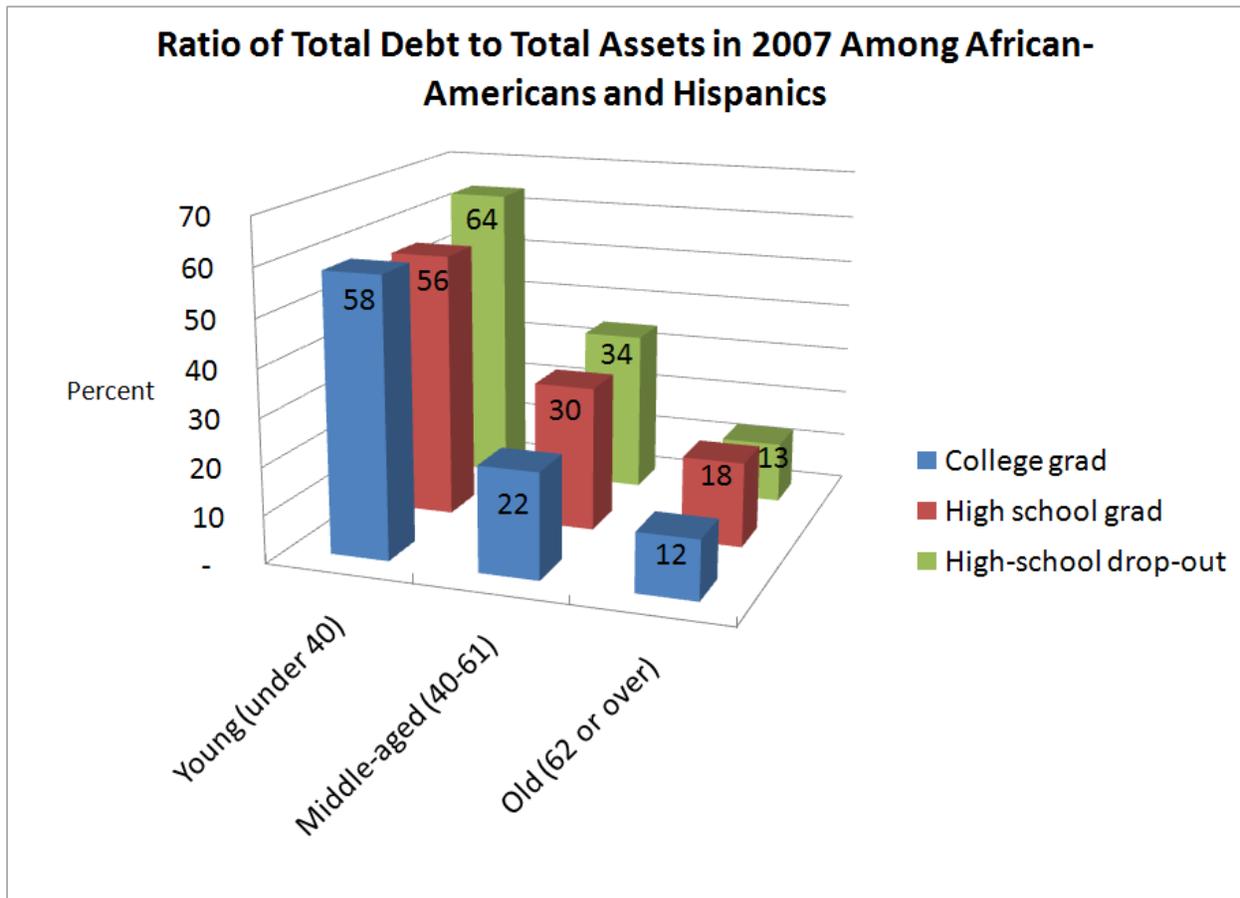
Source: Federal Reserve Board.

Figure 8 shows that younger and less-educated non-minority families tended to have higher debt-to-assets ratios in 2007 than older and better-educated families (a similar pattern existed for debt-to-income ratios; not shown). It appears that relative youth is the strongest influence on average debt ratios, while the effect of educational attainment is not as strong or clear-cut.

The dominant influence of age on balance-sheet leverage is evident also in Figure 9, which depicts debt-to-assets ratios for nine minority subgroups. Educational-attainment also matters, as the debt ratios of all drop-out groups are higher than those of college-grad groups of the same age. Comparing Figures 8 and 9, race or ethnicity also emerges as a powerful predictor of debt ratios, as every minority subgroup had more leverage than the corresponding non-minority group. As with non-

minorities, the liability side of minority families’ balance sheets tended to correlate with and amplify the effects of high housing concentrations for the most economically vulnerable subgroups.

Figure 9



Source: Federal Reserve Board.

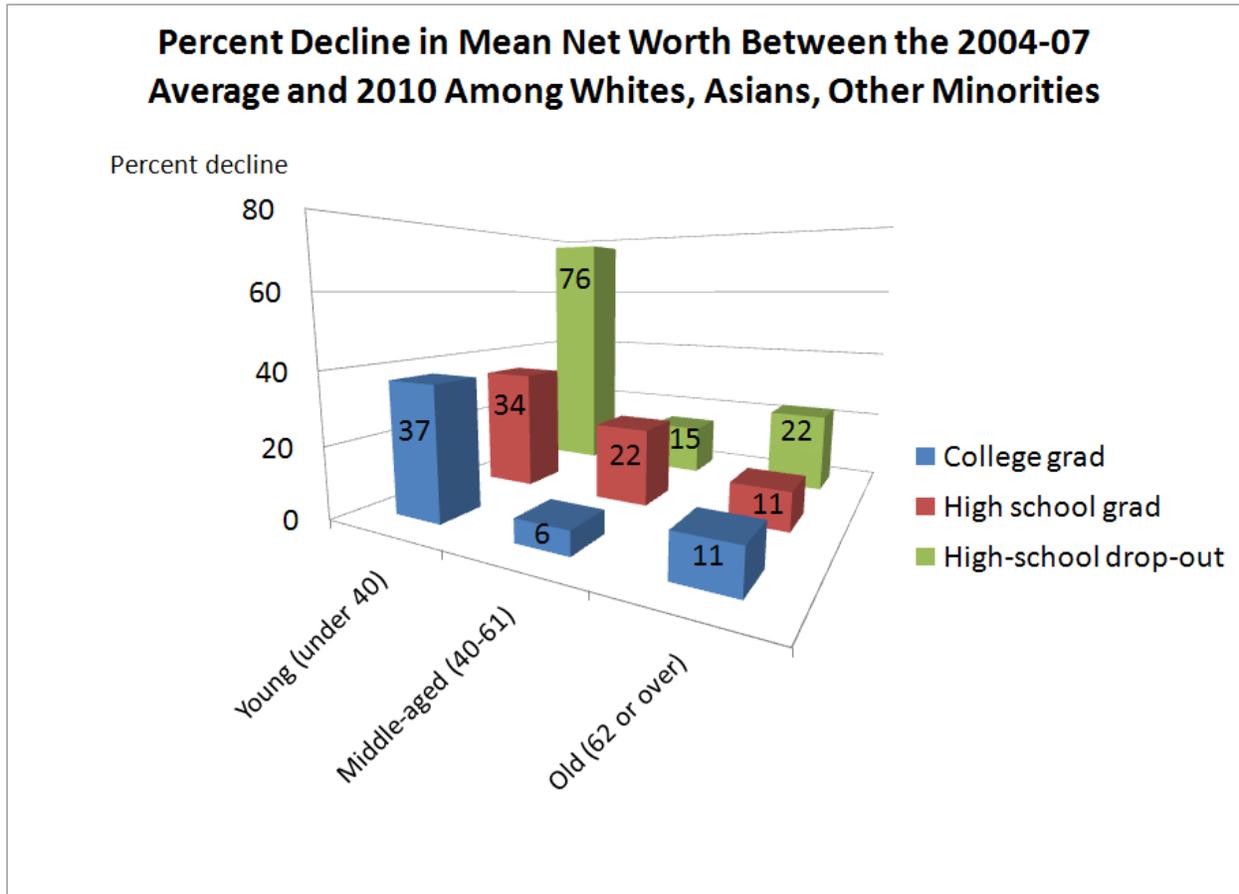
3. Who suffered the largest percentage declines in net worth?

Figure 10 shows that young non-minority families lost vastly more of their wealth between the 2004-07 average and the 2010 survey than middle-aged or old families.¹⁴ This was true across all

¹⁴ The reason for computing the change from the average of 2004 and 2007, rather than simply 2007, is that five of the 18 subgroups considered had higher average inflation-adjusted net worth in 2004 than in 2007. Note also that all of the major national house-price indexes peaked in 2006 in inflation-adjusted terms.

educational-attainment categories. Education levels also matter, as drop-out families experienced at least double the percentage decline in wealth compared to college-grad families in each age category.

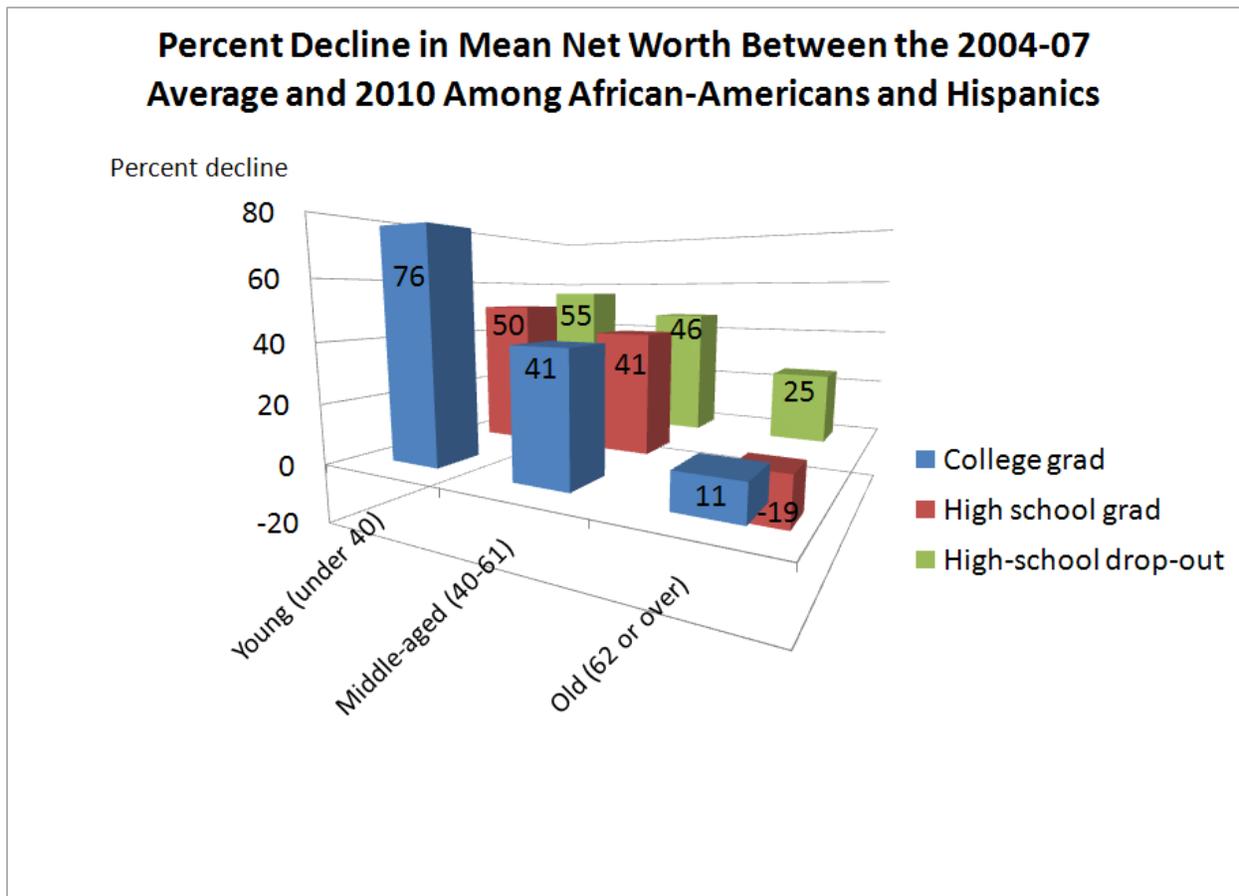
Figure 10



Source: Federal Reserve Board.

Among minorities, age plays a strong role in wealth losses across education categories (Figure 11). Indeed, the losses suffered by young minority families were proportionally even larger compared to similarly educated old families than among non-minority families (Figure 10). Middle-aged minority families fared quite poorly across all education levels, too. Within each age group, better educated minority families generally lost less wealth than high-school drop-outs, with one glaring exception. Young minority college grads as a group lost a staggering 76 percent of their wealth from the 2004-07 level, matched among the other 17 subgroups only by young non-minority drop-out families.

Figure 11



Source: Federal Reserve Board.

2010 leverage and wealth levels. How do balance sheets look after the crash? Figures 12 and 13 show that balance-sheet leverage increased during the crisis in 17 out of 18 subgroups (compare to Figures 8 and 9, which show the 2007 debt-to-assets ratios of non-minorities and minorities, respectively). The largest increase among non-minority families was for young high-school drop-outs; their debt-to-assets ratio increased from 33 to 63 percent. In most cases, the increases were driven primarily by falling asset values, rather than increased debt.

Figure 12

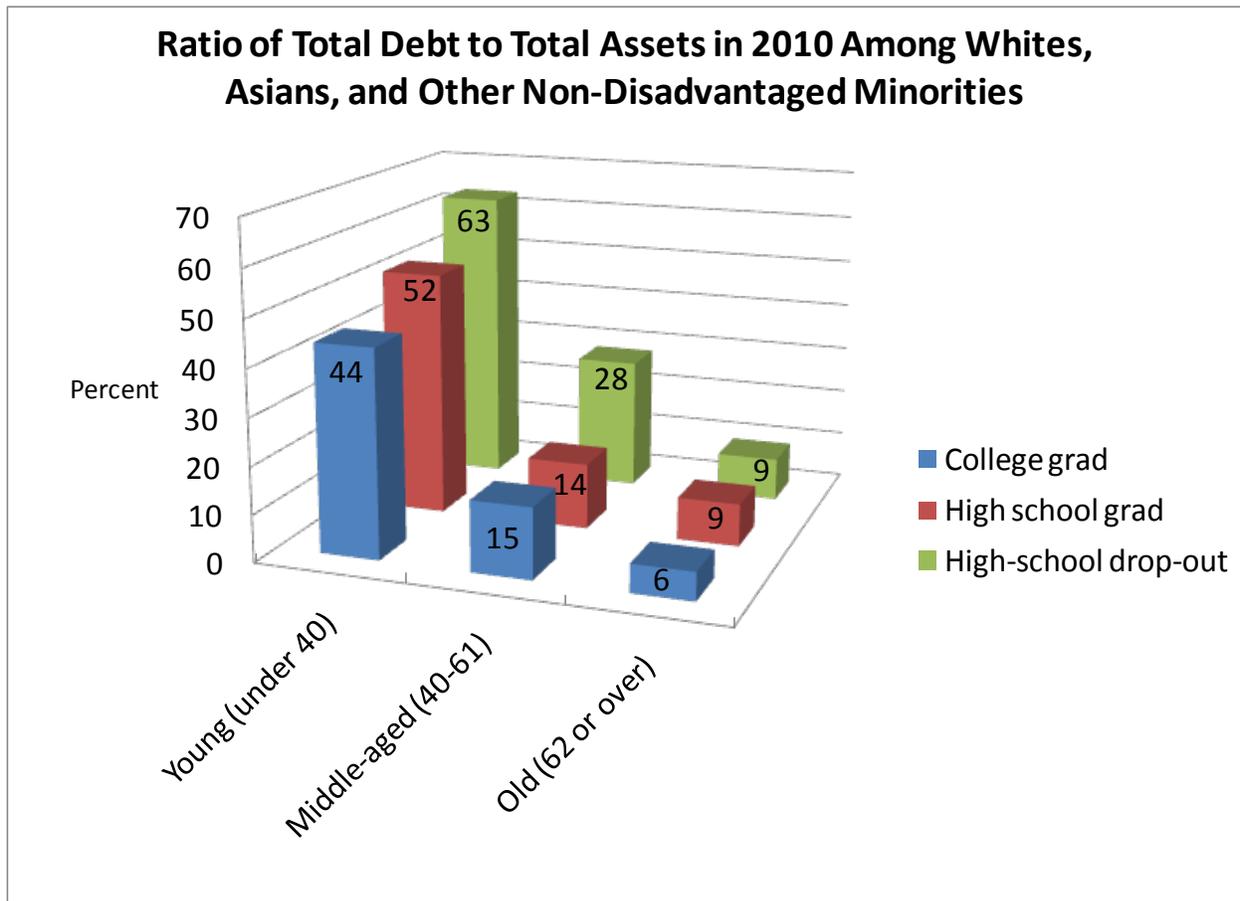
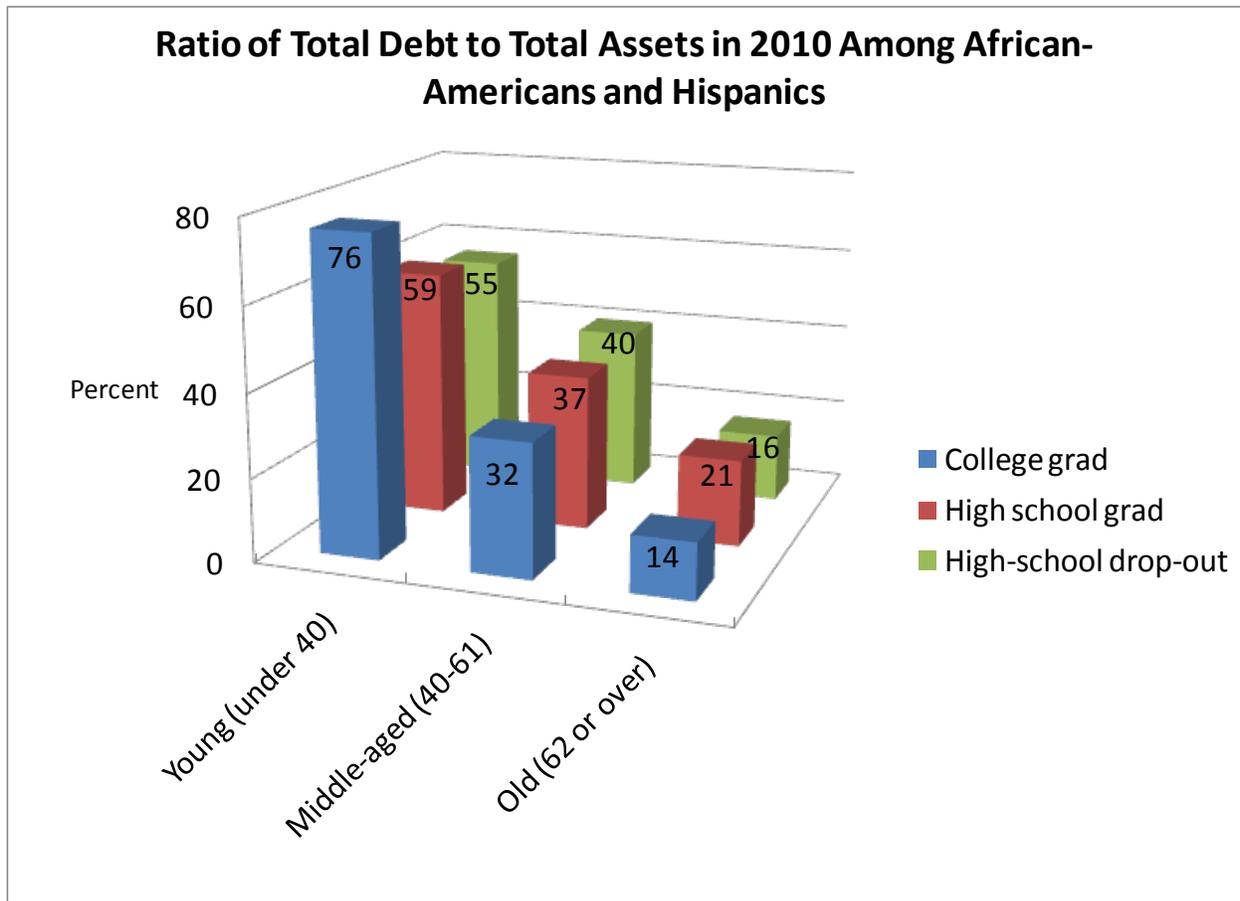


Figure 13 presents the debt-to-assets ratios of minority groups in 2010. The only group that did not increase from 2007 was young minority drop-outs; their debt-to-assets ratio declined from 64 to a still-high 55 percent. Looking at the assets and liabilities of this group, the best summary description of the balance-sheet changes might be “meltdown”. Average total assets declined 71 percent, including an 81-percent decline in housing assets. Total liabilities decreased 74 percent, including a 78-percent decline in mortgage debt. Net worth declined 64 percent, to \$10,467.

The largest increase between 2007 and 2010 in debt-to-assets ratio was among young minority college grads, whose average debt-to-assets ratio increased from 58 to 76 percent. This group’s net worth declined 66 percent from 2007, to \$33,154. Total assets decreased 40 percent, while total liabilities declined 21 percent.

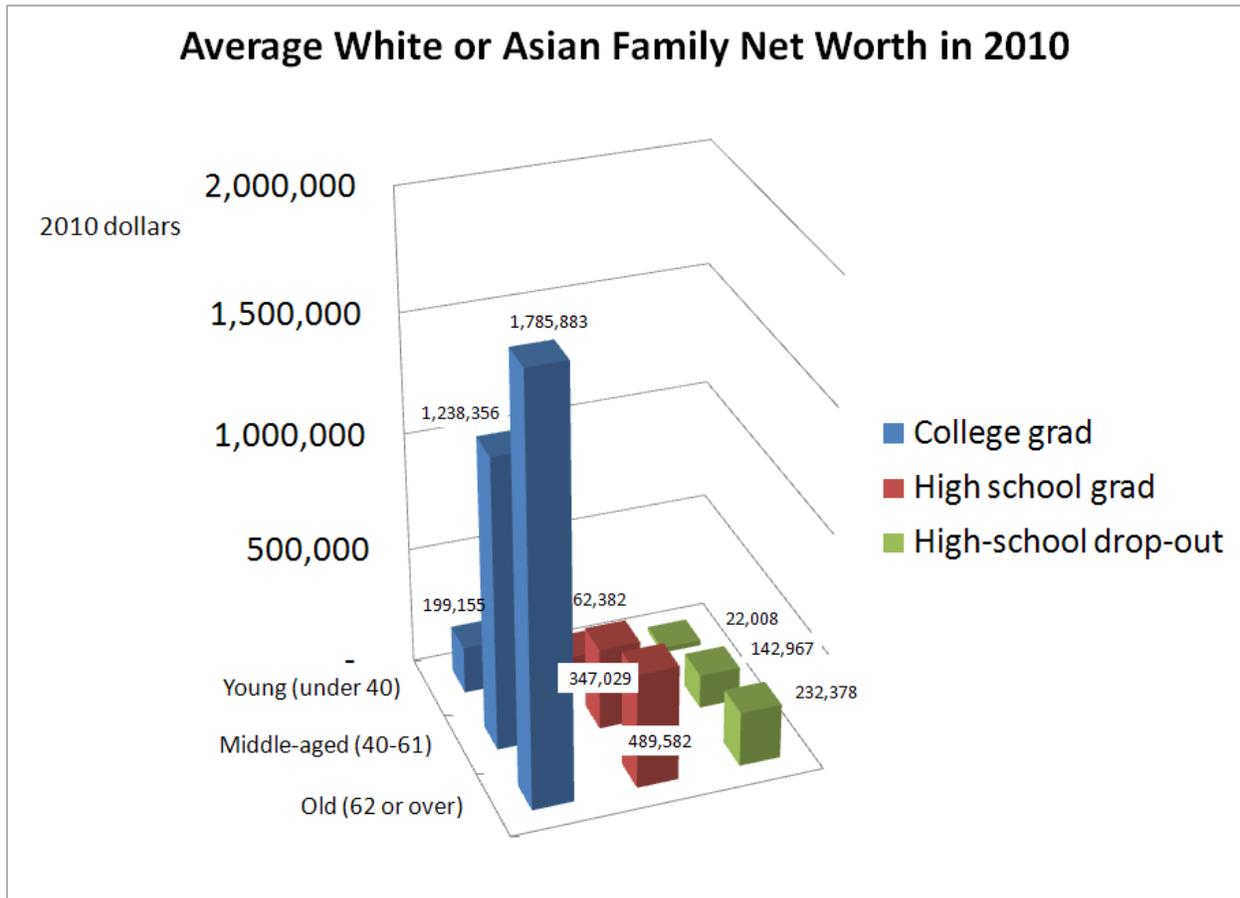
Figure 13



Figures 14 and 15 show the levels of net worth of each of the 18 groups we study. Wealth levels vary enormously—in part due to vast differences before the crisis, but importantly reinforced by widely disparate wealth losses during the crisis.

Family net worth in 2010 among whites, Asians, and other non-disadvantaged minorities is shown in Figure 14. Perhaps the most striking aspect of Figure 14 is the stark difference between the average net worth of non-minority families with college degrees and those without, regardless of age. Upon closer inspection, the same is true of high-school graduates compared to high-school drop-outs across the lifespan. In other words, higher levels of educational attainment are strongly positively related to higher levels of wealth among non-minorities, on average.

Figure 14

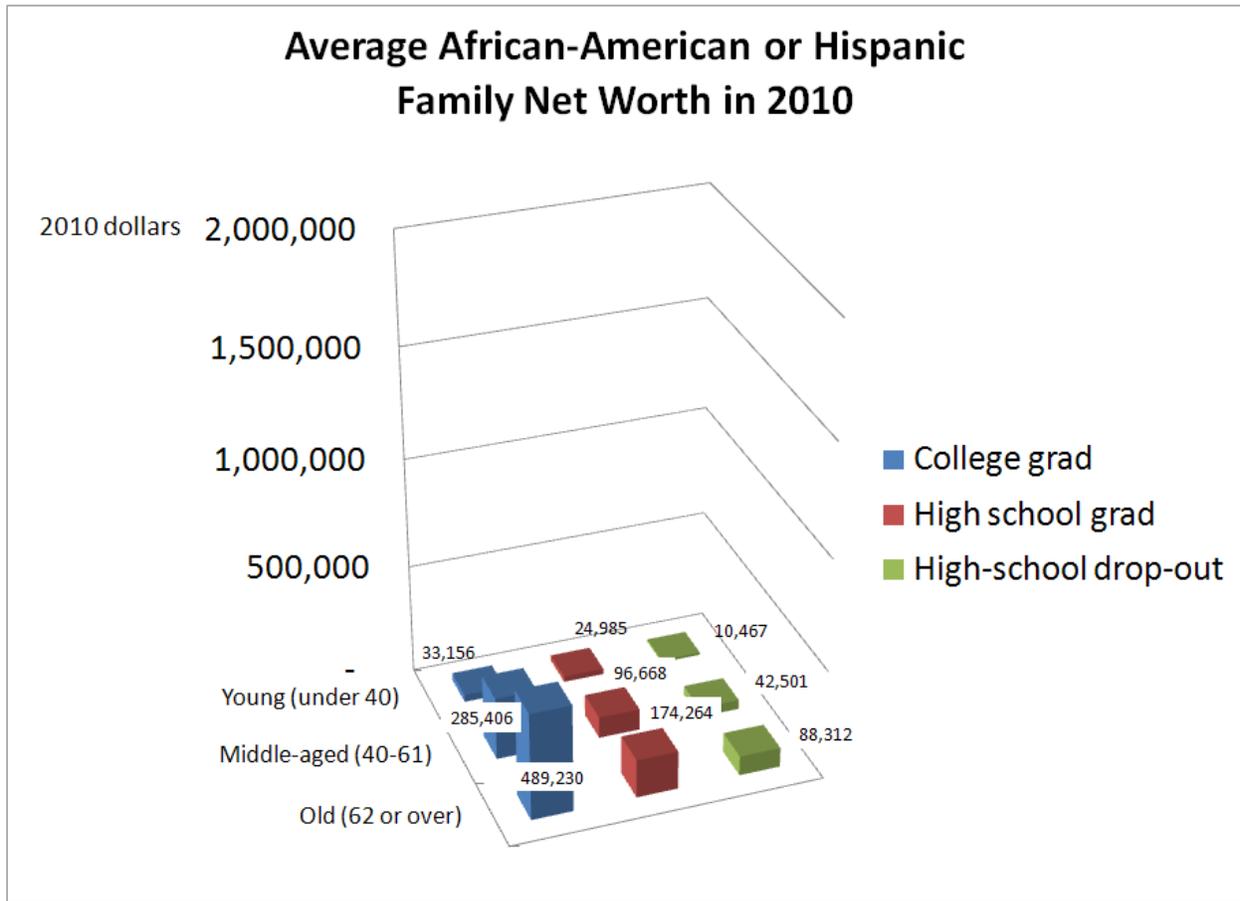


Source: Federal Reserve Board.

The second clear pattern in Figure 14 is that average wealth increases with age, especially between youth and middle age. Young families have average net worth that is a small fraction of the net worth of middle-aged families. Families headed by someone between 40 and 61, in turn, have significantly less wealth, on average, than families headed by someone 62 or older.

Figure 15 provides the same information for minority families. Here the first strong impression is how much lower average wealth is for minorities compared to non-minorities. The same patterns connecting higher levels of education and older family heads to higher wealth also hold true among minority families.

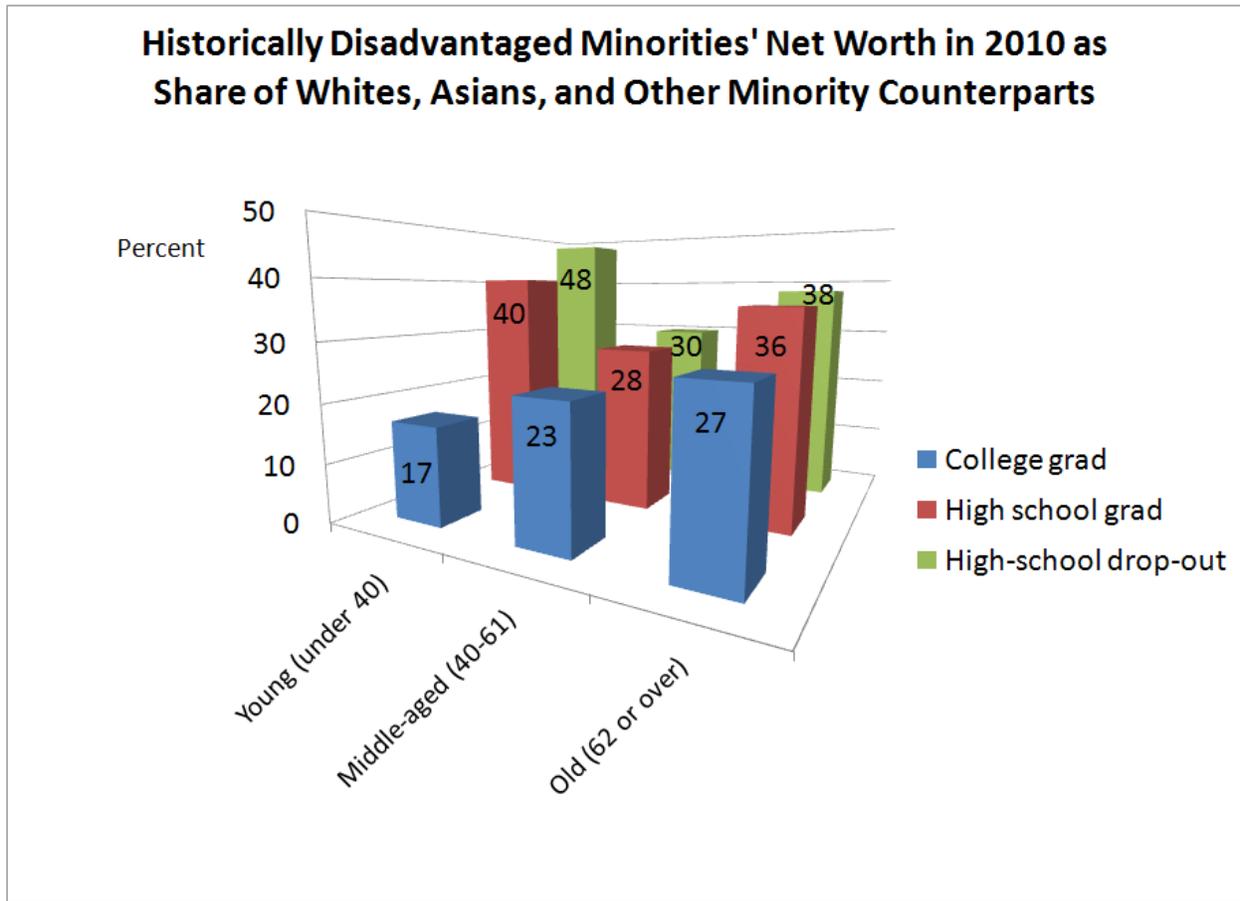
Figure 15



Source: Federal Reserve Board.

Combining the information in the two previous figures, Figure 16 compares the average net worth of each minority family group in 2010 to its non-minority counterpart. The ratio of average minority family net worth to comparable non-minority net worth ranges from a low of 17 percent, among young college graduates, to a high of 48 percent, among young high-school drop-outs. Higher levels of educational attainment appear to be less effective in building wealth for minority families than for non-minority families, as reflected in lower ratios in Figure 16.

Figure 16



Source: Federal Reserve Board.

4. Evidence on the importance of demographic factors in balance-sheet choice

The evidence presented above suggests that age, educational attainment, and race or ethnicity are associated with key balance-sheet measures of risk and measures of wealth losses during the financial crisis and recession. In this section, we provide regression evidence that provides insight into the relative importance of demographic determinants of financial behavior and outcomes.

Safe and liquid assets. The ratio of safe and liquid assets to family income is a proxy for the size of the emergency fund a family maintains. Table 3 displays results of three OLS regression of a family's

safe-and-liquid-assets ratio on demographic indicator variables; a host of economic, financial, and attitudinal variables from the SCF waves of 1998 through 2010; and year dummies. Each of the second set of variables is expressed as the deviation for a particular family from the mean of the subgroup to which it belongs (i.e., one of the 18 age, education, and race or ethnicity groups).

Regression (1) uses only the demographic variables and the year dummies. Each of the demographic indicator variables is highly significant in the direction we expect. That is, the older the family, the higher the safe-assets ratio; the higher the education level, the higher the safe-assets ratio; and minorities have a lower safe-assets ratio than non-minorities. The coefficient estimates also suggest the differences are economically large. Compared to middle-aged families, for example, being a young family is associated with a 21-percentage point lower ratio of safe assets to income. Old families have a remarkable 67-percentage point higher safe-assets ratio than middle-aged families.

Similarly across education groups, the differences are economically large. High-school drop-outs have an 18-percentage point lower safe-assets ratio than high-school grads, while college grads have a 23-percentage point higher safe-assets ratio than high-school grads. Minority families have a 23-percentage point lower safe-assets ratio. The dummy variables for 2007 and 2010 are highly significantly negative although not particularly large, indicating that safe-asset ratios were depleted both before and after the financial crisis.

Regression (2) uses a host of endogenous variables in de-measured form to capture idiosyncratic deviations of families that are not explained by our exogenous demographic variables. The idea is that, relative to the subgroup's average value on, say, the income variable—which may be determined in large part by demographic variables—a family's deviation from the average may contain information relevant to its balance-sheet behavior.

Our preferred specification is shown as regression (3). We employ the exogenous demographic variables, the de-meaned endogenous variables, and the year dummies together to explain a family's safe-assets-to-income ratio. The co-efficients and significance levels of most of the variables from all three sets of variables survive largely intact from regressions (1) and (2). We conclude that age, educational attainment, and race or ethnicity are very strong predictors of a family's chosen safe-assets-to-income ratio.

Table 3

Dependent variable: Ratio of safe and liquid assets to annual family income

	(1)	(2)	(3)
Intercept	0.441***	0.490***	0.368***
Age under 40 dummy (aged 40-61 omitted)	-0.209***		-0.162***
Age 62 or older dummy (aged 40-61 omitted)	0.667***		0.662***
Less-than-high school dummy (High school or GED omitted)	-0.178***		-0.157***
College grad dummy (High school or GED omitted)	0.226***		0.188***
Member of historically disadvantaged minority dummy (white or non-disadvant. minority omitted)	-0.231***		-0.198***
Married deviation		-0.018	-0.055***
Number of kids deviation (Normalized)		-0.042***	-0.035***
Square root of income deviation (Normalized)		-0.046***	-0.052***
Available credit line amount deviation (Normalized)		0.028***	0.025***
Square root of assets deviation (Normalized)		0.094***	0.083***
Saved within the last year dummy deviation		0.161***	0.148***
Emergency funds needed target deviation (Normalized)		0.064***	0.067***
Believe you are financially lucky deviation		-0.110***	-0.112***
History of credit problems deviation		-0.173***	-0.191***
2001 Dummy	-0.008	0.002	-0.002
2004 Dummy	-0.048*	-0.024	-0.028
2007 Dummy	-0.073***	-0.022	-0.056**
2010 Dummy	-0.104***	-0.062***	-0.070***
R-Squared for first implicate	0.1083	0.0735	0.1628

Unweighted Regressions using RII techniques

*, **, and *** signify significance at .1, .05, and .01 levels, respectively

The deviation variables are deviations from weighted mean within the smallest demographic subgroup for age, race, and education level.

Residential real-estate portfolio share. Table 4 presents the co-efficient estimates from three OLS regressions of home-owning families' ratio of residential real estate to total assets on demographic indicator variables; demeaned endogenous variables; and year dummy variables. Our decision to include here only regressions that include homeowners, rather than all families, represents a compromise. We would like to capture both the extensive margin of homeownership—the decision to become a homeowner—and the intensive margin—how expensive a house to buy. However, both decisions are endogenous. We would need to model the two distinct decisions involved, but this is beyond the scope of the current paper.¹⁵

We could collapse the two decisions into a single dimension, as we did in Figures 6 and 7. In a regression framework, however, the large number of young families with no residential real estate would dominate the results in an unweighted regression. This would, in our view, inaccurately suggest that young families behave very conservatively in their housing decisions. To be sure, some do; but many do not. In a regression weighted by a family's housing assets or total assets or other dollar measure, on the other hand, a relatively few families could unduly influence the results we ascribe to young families overall. We adopt a compromise position involving unweighted regressions among home-owning families alone.

Once again, regression (1) suggests that demographic variables predict housing portfolio shares—conditional on being a homeowner—in the directions we expect. There is strong evidence of a time trend, with increasing housing shares from 2004 onward. Regression (2) shows results using only the de-measured endogenous variables and year dummies, while regression (3) combines all three sets of variables.

¹⁵ Emmons and Noeth (2013) provides a detailed discussion of homeownership across age groups.

The co-efficient estimates from our preferred specification, regression (3), suggest that being young is associated with a 13-percentage point higher housing portfolio share than among middle-aged families which, in turn, have housing shares about 3.5 percentage points higher than old families. High-school drop-outs have housing portfolio shares nine percentage points higher than high-school grads, which have 13 percentage points more housing than college grads. Finally, minorities have housing portfolio shares about 14 percentage points higher than non-minorities.

Table 4

Dependent Variable: Ratio of residential real-estate assets to total assets among homeowners only

	(1)	(2)	(3)
Intercept	0.492***	0.511***	0.542***
Age under 40 dummy (aged 40-61 omitted)	0.138***		0.128***
Age 62 or older dummy (aged 40-61 omitted)	-0.048***		-0.035***
Less-than-high school dummy (High school or GED omitted)	0.099***		0.092***
College grad dummy (High school or GED omitted)	-0.146***		-0.130***
Member of historically disadvantaged minority dummy (white or non-disadvant. minority omitted)	0.146***		0.135***
Married deviation		-0.057***	-0.060***
Number of kids deviation (Normalized)		0.013***	0.009***
Square root of income deviation (Normalized)		-0.019***	-0.016***
Available credit line amount deviation (Normalized)		-0.008***	-0.018***
Saved within the last year dummy deviation		-0.096***	-0.094***
Emergency funds needed target deviation (Normalized)		-0.005***	-0.004***
Believe you are financially lucky deviation		0.044***	0.049***
History of credit problems deviation		0.047***	0.042***
2001 Dummy	-0.001	-0.010	-0.006
2004 Dummy	0.049***	0.047***	0.053***
2007 Dummy	0.057***	0.050***	0.059***
2010 Dummy	0.079***	0.061***	0.065***
R-Squared for first implicate	0.1267	0.1321	0.2292

Unweighted Regressions using RII techniques

*, **, and *** signify significance at .1, .05, and .01 levels, respectively

The deviation variables are deviations from weighted mean within the smallest demographic subgroup for age, race, and education level.

Balance-sheet leverage. Table 5 shows the co-efficient estimates from three OLS regressions of a family's ratio of total debt to total assets on demographic indicator variables; demeaned endogenous variables; and year dummy variables. As before, regression (1) suggests that demographic variables are powerful predictors of balance-sheet leverage, although the relationship between educational attainment and leverage may be non-linear. The years 2007 and 2010 appear to be different from earlier years, suggesting a time trend. Regression (2) shows results using only the de-meaned endogenous variables and year dummies, while regression (3) combines all three sets of variables.

Table 5

Dependent variable: Total debt-to-total assets (DTA) ratio

	(1)	(2)	(3)
Intercept	0.275***	0.350***	0.306***
Age under 40 dummy (aged 40-61 omitted)	0.343***		0.322***
Age 62 or older dummy (aged 40-61 omitted)	-0.180***		-0.178***
Less-than-high school dummy (High school or GED omitted)	-0.037**		-0.043***
College grad dummy (High school or GED omitted)	-0.061***		-0.037***
Member of historically disadvantaged minority dummy (white or non-disadvant. minority omitted)	0.080***		0.067***
Married deviation		-0.072***	-0.056***
Number of kids deviation (Normalized)		0.002	-0.001
Square root of income deviation (Normalized)		-0.013***	-0.007***
Available credit line amount deviation (Normalized)		0.018***	0.020***
Saved within the last year dummy deviation		-0.141***	-0.135***
Emergency funds needed target deviation (Normalized)		-0.007**	-0.006*
Believe you are financially lucky deviation		0.139***	0.136***
History of credit problems deviation		0.232***	0.235***
2001 Dummy	-0.016	-0.030**	-0.021
2004 Dummy	0.025	0.014	0.023
2007 Dummy	0.039**	0.021	0.040***
2010 Dummy	0.104***	0.082***	0.091***
R-Squared for first implicate	0.0868	0.0675	0.1386

Unweighted Regressions using RII techniques

*, **, and *** signify significance at .1, .05, and .01 levels, respectively

The deviation variables are deviations from weighted mean within the smallest demographic subgroup for age, race, and education level.

The co-efficient estimates from our preferred specification, regression (3), suggest that age is a strong predictor of balance-sheet leverage. Being young is associated with a 32-percentage point higher debt-to-assets ratio than being middle-aged which, in turn, is associated with an 18-percentage point higher ratio than among old families. The effect of educational attainment appears to be non-linear. High-school grads have the highest debt-to-assets ratios, while both high-school drop-outs and college grads have lower ratios. The size of these effects is not large, however. Finally, minorities have six-percentage-point higher debt-to-asset ratios than non-minorities.

5. Interventions to break the link between economic vulnerability and risky balance sheets

Using the Federal Reserve's Survey of Consumer Finances, we found that several groups of economically vulnerable families went into the recession with risky balance sheets—holding low levels of emergency savings, being highly concentrated in housing, and owing a lot of debt. Those same families generally suffered the largest percentage decreases in wealth, on average. A decade or more of financial innovation and liberalization may have been a factor increasing the riskiness of many of these families' balance sheets, as greater amounts of credit were available to more people than ever before. Economically vulnerable families may have been more susceptible to the “siren songs” of homeownership and easy credit in part due to low levels of financial knowledge or sophistication.

Can the link between economic vulnerability and risky balance sheets be broken? In what follows, we briefly illustrate where several types of interventions fit into our schematic of the determination of earnings, financial knowledge, and financial behavior. Our general conclusion is that the earlier in the chain of causation the intervention occurs, the more likely it is to be effective.

Financial-literacy training. It would seem the most direct response to evidence of poor financial decision-making would be to provide financial-literacy training. As Figure 17 makes clear, however, such an intervention may be “too little, too late”. The fundamental determinants of financial knowledge, we have argued, include human capital and its determinants as well as the incentives to become financially knowledgeable. Financial-literacy training of low-income adults, for example, may yield modest results.

In-kind or cash benefits. If low incomes are the reason why families do not save, which fact, in turn, reduces the incentive to become financially knowledgeable, then we could seek to raise families’ incomes. But there is no automatic link between higher income and higher saving; and the amounts of likely transfers may not remove the most important aspects of the “poverty trap” created by means-tested benefits and progressive social insurance. Thus, there is no strong reason to believe that benefits targeted at low-income families would translate reliably into greater financial knowledge (Figure 18).

Individual development accounts (IDAs). IDAs combine saving subsidies with financial-literacy training and, importantly, a long-term commitment by the participant to achieve a saving goal. As Figure 19 suggests, IDAs combine interventions at several stages in the financial-behavior process. They do not necessarily affect human capital, which we have suggested is a key determinant of financial behavior and ultimate financial outcomes.

Early-childhood intervention. The most effective interventions are likely to be at very early stages in an individual’s life because human capital is a key to both economic and financial success and stability (Figure 20). These could include health, nutrition, or educational enrichment, savings accounts, or even financial education if it is properly designed.

In sum, economic vulnerability and financial fragility are linked because they have common causes. Breaking the link likely will involve fundamental interventions that enhance human capital.

Figure 17

Intervention Strategy: Financial-Literacy Training

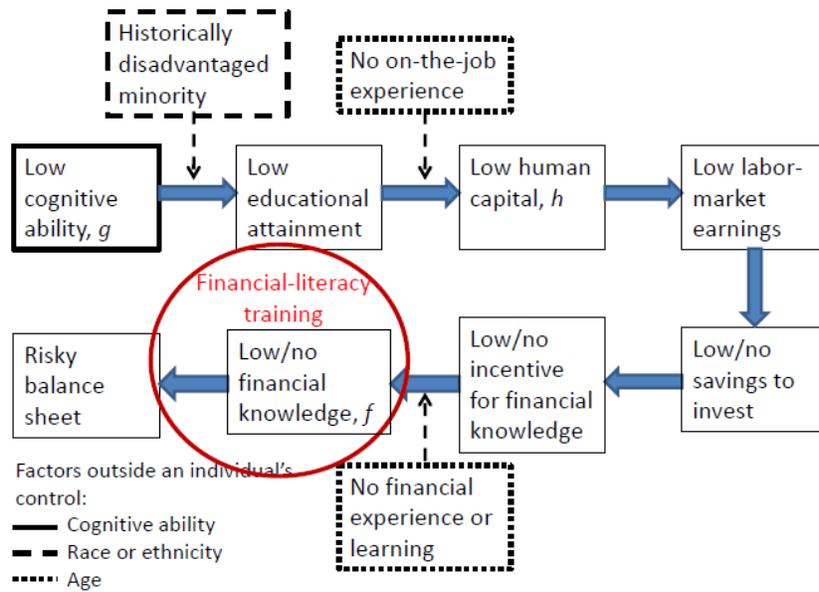


Figure 18

Intervention Strategy: Redistribution in Cash or In Kind

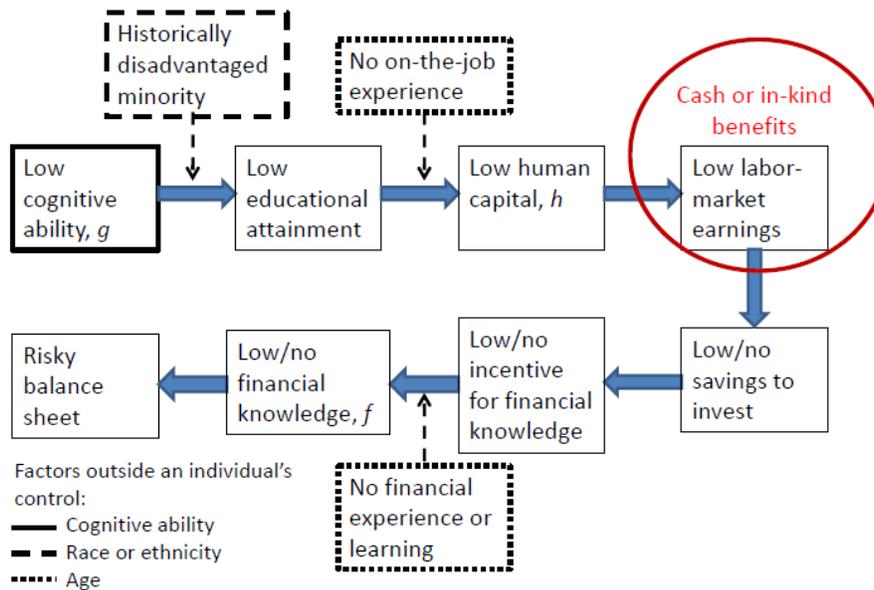


Figure 19

Intervention Strategy: Individual Development Accounts

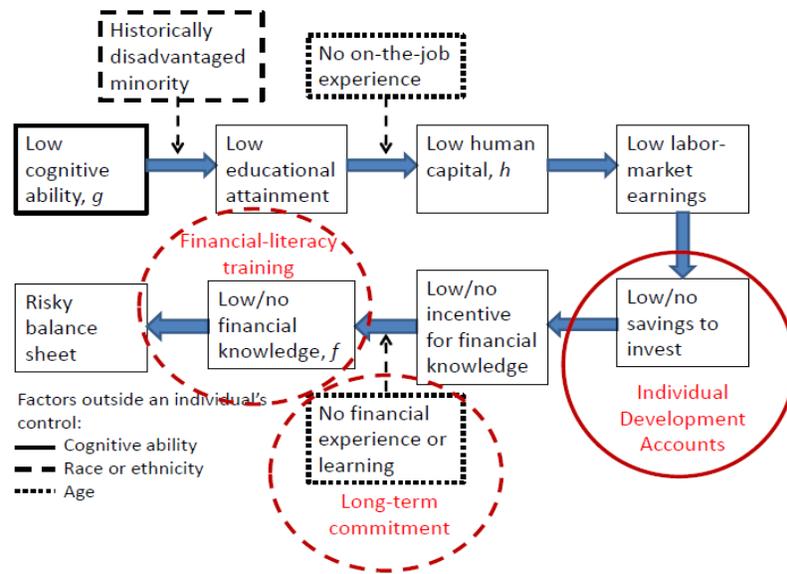
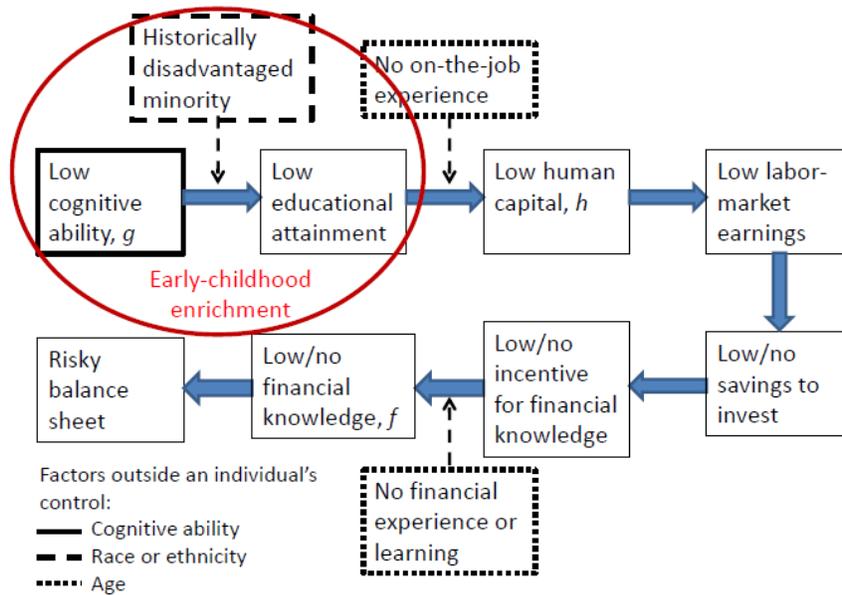


Figure 20

Intervention Strategy: Early-Childhood Enrichment



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