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Mortgage Defaults

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An Engine for Economic Growth

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Do developed financial markets lead to economic growth or result from it? While some economists argue for the latter, the author maintains that financial markets—despite their shortcomings of late—are an essential ingredient for an economy to grow in the long run.

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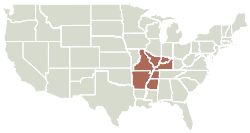

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James Bullard, President and CEO
Federal Reserve Bank of St. Louis

CPI vs. PCE Inflation: Choosing a Standard Measure

Two different price indexes are popular for measuring inflation: the consumer price index (CPI) from the Bureau of Labor Statistics and the personal consumption expenditures price index (PCE) from the Bureau of Economic Analysis. Each of these is constructed for different groups of goods and services, most notably a headline (or overall) measure and a core (which excludes food and energy prices) measure. Which one gives us the actual rate of inflation that consumers face?

On the headline vs. core issue, I prefer to focus on headline inflation, measured as the percentage change in the price index from a year ago to smooth out the fluctuations in the data. As I have discussed previously, headline measures attempt to reflect the prices that households pay for a wide variety of goods, not a subset of those goods.[1] Headline inflation is, therefore, designed to be the best measure of inflation that we have.

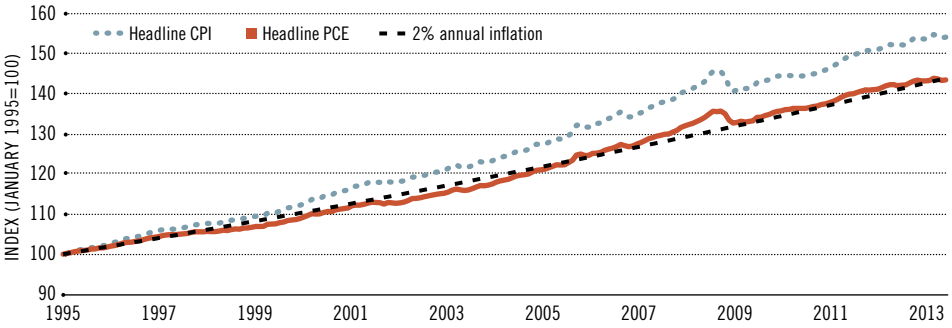
Between the two headline indexes, the CPI tends to show more inflation than the PCE. From January 1995 to May 2013, the average rate of inflation was 2.4 percent when measured by headline CPI and 2.0 percent when measured by headline PCE. Hence, after setting both indexes equal to 100 in 1995, the CPI was more than 7 percent higher than the PCE in May 2013.[2] (See the chart.)

An accurate measure of inflation is important for both the U.S. federal government and the Federal Reserve's Federal Open Market Committee (FOMC), but they focus on different measures. For example, the federal government uses the CPI to make inflation adjustments to certain kinds of benefits, such as Social Security.[3] In contrast, the FOMC focuses on PCE inflation in its quarterly economic projections and also states its longer-run inflation goal in terms of headline PCE. The FOMC focused on CPI inflation prior to 2000 but, after extensive analysis, changed to PCE inflation for three main reasons: The expenditure weights in the PCE can change as people substitute away from some goods and services toward others, the PCE includes more comprehensive coverage of goods and services, and historical PCE data can be revised (more than for seasonal factors only).[4]

Given that the two indexes show different inflation trends in the longer run, having a single preferred measure that is used by both the federal government and the FOMC might be appropriate. What would it mean if it were determined that headline PCE inflation is the better measure of prices consumers face (indicating, thus, that the CPI overstates the true inflation rate)? Continuing to use the CPI would imply over-adjusting for inflation and, in effect, giving real increases in benefits over time. In this scenario, benefits should be adjusted for inflation using the PCE instead. Conversely, if it were determined that headline CPI inflation is the better measure (and, therefore, that the PCE understates the true inflation rate), then the FOMC should target CPI inflation rather than PCE inflation.

The FOMC carefully considered both indexes when evaluating which metric to target and concluded that PCE inflation is the better measure. In my view, headline PCE should become the standard and, therefore, should be consistently used to estimate and adjust for inflation. Although adopting a standard measure would likely not be a simple matter, it would provide clarity to the public about which one more accurately reflects consumer price inflation. Ω

Comparing Price Indexes: CPI vs. PCE



SOURCES: Data obtained from FRED® (Federal Reserve Economic Data) and author's calculations.

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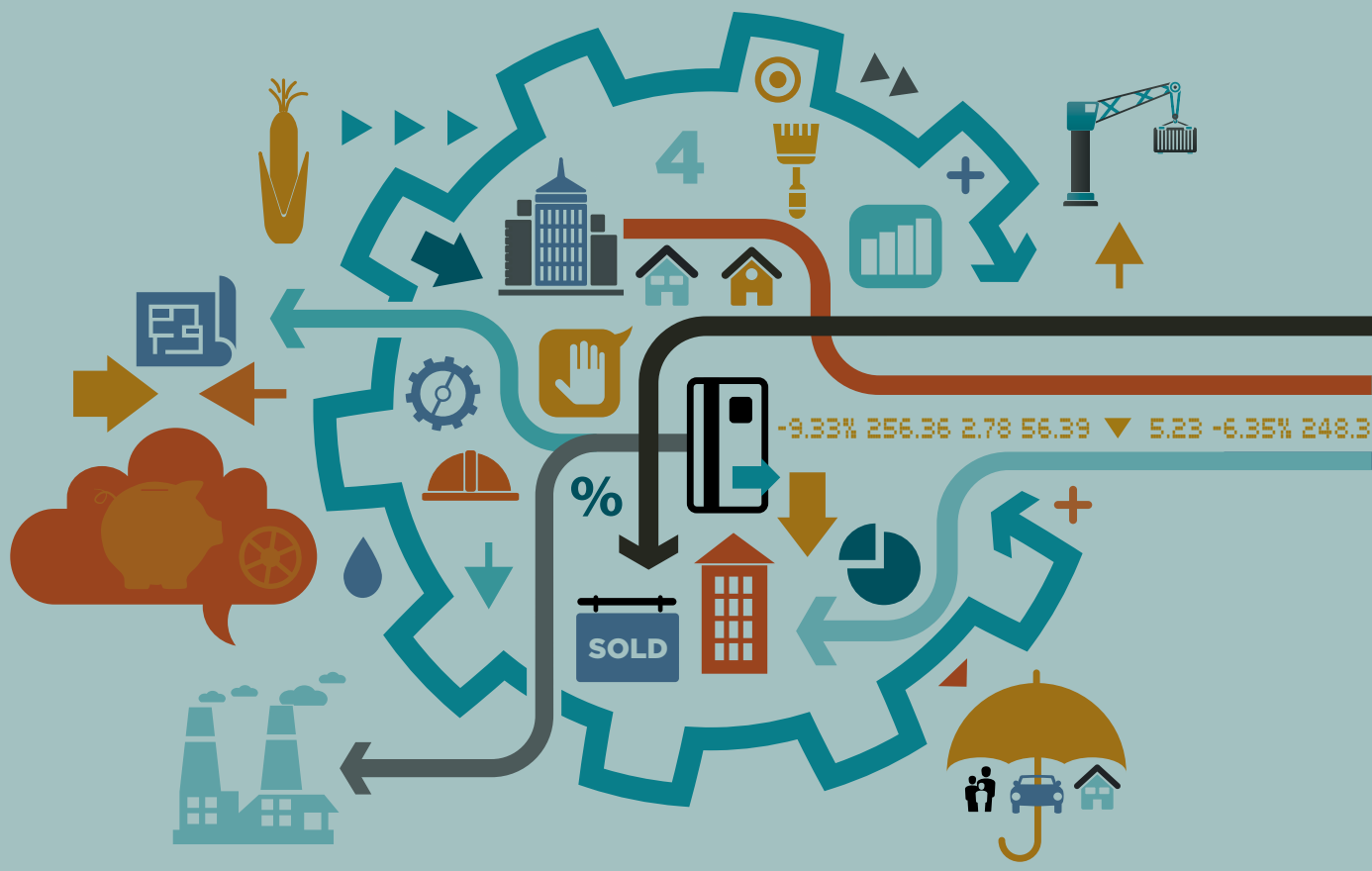
ENDNOTES

1 See "Measuring Inflation: The Core Is Rotten," Federal Reserve Bank of St. Louis *Review*, July/August 2011, Vol. 93, No. 4, pp. 223-33. See http://research.stlouisfed.org/publications/review/11/07/bullard.pdf.

2 In 2002, the Bureau of Labor Statistics began releasing a chain-weighted version of the CPI, which behaves similarly to the PCE over long periods of time.

3 CPI-W, the index for urban wage earners and clerical workers, is used to adjust these benefits for inflation, whereas CPI-U (headline) is shown in the chart. The two show similar trends from 1995 to the present.

4 For more discussion, see the *Monetary Policy Report to the Congress*, on Feb. 17, 2000, at www.federalreserve.gov/boarddocs/hh/2000/February/FullReport.pdf.



Financial Markets

An Engine for Economic Growth

By Yongseok Shin

In the aftermath of the 2008 financial crisis, it is natural to wonder about the roles that the highly developed financial sector plays in our economy. Some might wonder whether this sector causes more harm than it does good. In this article, I examine data from countries with varying degrees of economic development and argue that developed financial markets are an essential ingredient of long-run economic growth.

Before I begin, let me clarify two things. First, it is not my contention that all financial market activities have a positive impact on economic growth. To the contrary, excesses and abuses in financial markets can be detrimental to economic growth in the long run. Second, developed financial markets provide useful services that do not directly contribute to economic growth. For example, most insurance policies are designed to enhance economic welfare through better allocation of risk, not through the promotion of economic growth. More broadly, the purpose of this article is not to list all the pros and cons of financial market development. Rather, I show the importance of financial markets to economic growth. Knowing the important contributions of well-functioning financial markets will help us figure out (1) which financial market activities to promote and (2) where to direct our regulatory and supervisory efforts.

The Schumpeterian Hypothesis

The nexus of finance and economic growth was first emphasized by Joseph Schumpeter in 1911. In Schumpeter's theory, widely known as the theory of "creative destruction," innovation and entrepreneurship are the driving forces of economic growth. He viewed finance as an essential element of this process. Innovation and entrepreneurship will thrive when the economy can successfully mobilize productive savings, allocate resources efficiently, reduce problems of information asymmetry and improve risk management, all of which are services provided by a developed financial sector.

The surest way to test such a hypothesis would be to perform a randomized, controlled experiment, in which we would improve financial markets in a randomly chosen group of countries and shut down financial markets in the others. Since it is not possible (or desirable) to conduct such experiments on national economies, economists have tried to infer the importance of finance for economic growth from observations on countries with varying degrees of financial and economic development.

The first attempts at empirical evaluations of Schumpeter's hypothesis came in the late 1960s and the early 1970s; these attempts documented close relationships between financial development and economic development across countries.[1] However, critics refuted this evidence, rightly, since correlation does not imply causation. Many prominent economists argued that finance simply follows economic development.[2]

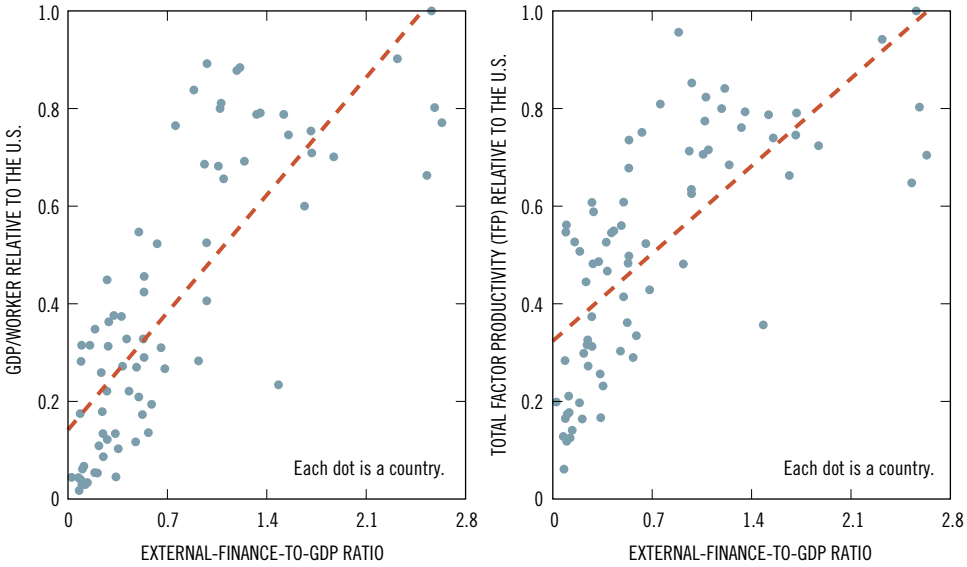
More recently, researchers have responded to this criticism. I highlight three different approaches in this article.

Empirical Patterns across Countries

First, in a 1993 paper, Robert King and Ross Levine addressed the correlation-not-causation issue by showing that countries

FIGURE 1

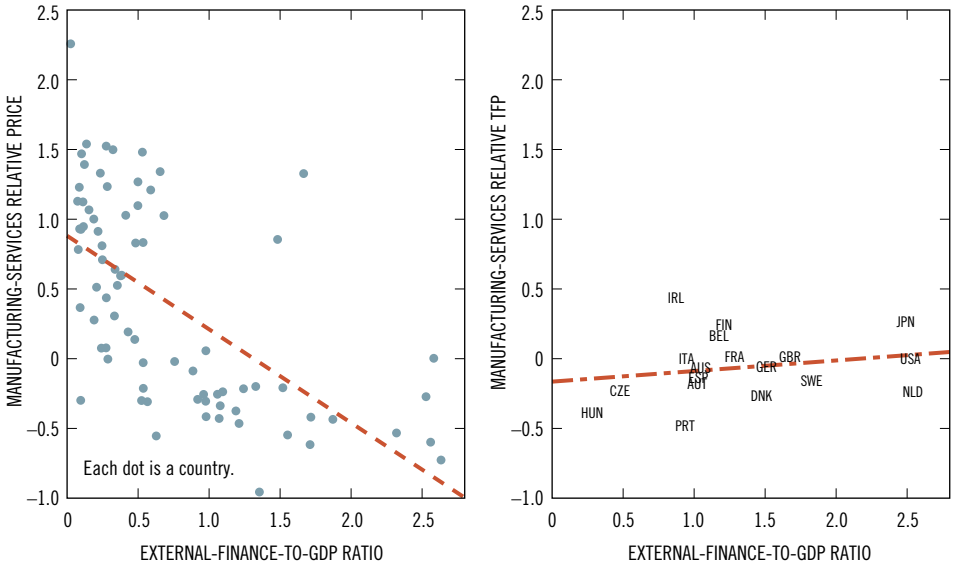
Relationship between Financial Development and Economic Development



SOURCE: Buera, Kaboski and Shin.

FIGURE 2

Relationship between Financial Development and Manufacturing-Services Relative Productivity



SOURCE: Buera, Kaboski and Shin.

NOTE: In the right panel, the 18 countries are: Australia (AUS), Austria (AUT), Belgium (BEL), Czech Republic (CZE), Denmark (DNK), Finland (FIN), France (FRA), Germany (GER), Hungary (HUN), Ireland (IRL), Italy (ITA), Japan (JPN), the Netherlands (NLD), Portugal (PRT), Spain (ESP), Sweden (SWE), the United Kingdom (GBR) and the United States (USA).

with higher levels of financial development in 1960 experienced higher rates of economic growth in the following three decades. King and Levine measured a country's financial development in terms of the levels of credit (e.g., bank loans and bonds issued) and stock market capitalization, a metric that is still widely used. Based on their findings, they rejected the idea that finance merely follows economic growth. But their results did not prove—for at least two reasons—that finance *causes* economic growth.

First, even though a country's financial development in 1960 is a predetermined variable relative to the economic growth in the next three decades, both financial and economic development may still be mere consequences of a common omitted factor. Second, because financial markets are forward-looking, financial development in 1960 may be the consequence of anticipated economic growth of the next few decades. In this "reverse causality" view, financial development may be a mere leading indicator of economic growth rather than a cause.

Industry-Level Evidence

Researchers then tried to come up with ways of testing Schumpeter's hypothesis that could surmount the above criticisms and clearly determine causality. In an influential paper in 1998, Raghuram Rajan and Luigi Zingales worked with detailed firm-level data that had not been used in the literature until then to test Schumpeter's hypothesis. Their theory is that, if Schumpeter were correct, industries that are more dependent on external financing would grow faster in countries with more-developed financial markets.

Using a database of publicly traded firms in the United States (Compustat), they ranked industries in terms of "external dependence," which is a measure of how dependent an industry is on external financing. Roughly speaking, it is the fraction of a firm's investment in a given year that is financed with debt and equity, rather than the year's cash flow.[3] There is a large variation in external dependence across industries, with pharmaceuticals having the highest (1.49) and tobacco the lowest (–0.45).[4]

Rajan and Zingales found that industries that are more dependent on external financing grew faster than those industries that are less dependent on external financing in

countries with developed financial markets,[5] but it is the other way around in countries with underdeveloped financial markets. They concluded that their result is consistent with the view of finance as a lubricant, just as Schumpeter hypothesized.

While their test result is not a proof of finance as a causal factor of economic growth, many economists count it as the most convincing evidence. The reason is that it is much harder, albeit not impossible, to come up with a plausible omitted-variable argument or reverse-causality argument on the relative performance of industries across countries.

Building an Economic Laboratory: A Model with Two Sectors

One weakness of the above empirical approaches is that the findings do not shed much light on the exact mechanism through which finance affects economic growth. To answer this question, the third and final approach that I discuss here takes a different tack. Indeed, it turns the previous approaches on their head. It starts by building an economic model whereby financial markets do have an impact on the long-run economic growth. The question is not whether finance is a causal factor for economic development (which is true by assumption) but how big an impact financial development has on economic development. We can also determine the exact channels through which finance affects economic development.

For a representative and concrete example of this modeling approach, I rely heavily on a study that I conducted with Francisco Buera and Joseph Kaboski in 2011, in which we built a model with multiple industrial sectors and with frictions in financial markets that interfere with efficient allocation of resources. The modeling of multiple industrial sectors was partly motivated by the findings of Rajan and Zingales.

We started by establishing important empirical facts on cross-country differences in economic development. First, countries' levels of financial development are closely correlated with their levels of economic development measured by output per worker. Second, poor countries' low levels of output per worker are primarily explained by their low levels of total factor productivity (TFP). TFP measures the level of the technology that combines capital and labor to produce output. A country with a high TFP produces more with a given amount of capital and labor than a country with a low TFP. Finally, the TFP gap between rich and poor countries varies systematically across industrial sectors of the economy. For instance, less-developed countries are particularly unproductive in producing manufactured goods, including equipment and machinery. These facts synthesize the findings of the two empirical studies discussed above and shift the focus onto an economy's TFP rather than income or output levels.

The left panel of Figure 1 shows the relationship between a country's financial development, measured by the ratio of private credit to gross domestic product (following the metric of King and Levine), and its level of economic development, measured by output per worker.[6] Each dot is a country, and the fitted straight line shows the average relationship between the two variables. The output per worker is relative to the output per U.S. worker. The figure confirms that more-developed economies also have more-developed financial markets.

The right panel of Figure 1 shows the relationship between a country's financial development and its level of aggregate TFP. The figure is a reflection of the fact that the difference across countries in terms of economic development, measured in terms of output per worker, is primarily explained by the difference in their TFP levels.

To have a clear analysis, we consider the simplest multisector economy: an economy with two sectors—manufacturing and services. We focus on the scale differences between manufacturing production and services production. On average, manufacturing operates at larger scales, which translates into more dependence on external financing.[7]

Sector-level TFP data are not available for most countries. We take advantage of the standard economic theory which implies that the relative price between the output of two sectors is the reciprocal of their relative productivity. In the left panel of Figure 2, we show the positive correlation between a country's relative price of manufactured goods to services and its level of financial development. This can be interpreted as lower relative TFP of manufacturing to services in countries that are less financially developed.

For a representative and concrete example of this modeling approach, I rely heavily on a study that I conducted with Francisco Buera and Joseph Kaboski in 2011, in which we built a model with multiple industrial sectors and with frictions in financial markets that interfere with efficient allocation of resources.

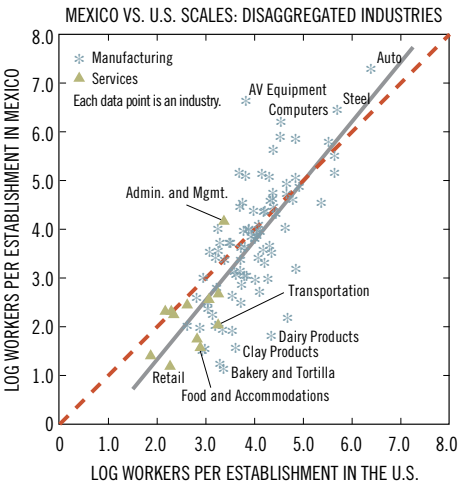
In the right panel of Figure 2, we only look at countries with sector-level TFP data and show their relative manufacturing-services TFP against their level of financial development. We verify that, for these countries, the relative sector-level TFP data are consistent with the sector-level relative prices.

The primary goal of our 2011 study was to present a rich quantitative framework and analyze the role of financial frictions in explaining the above empirical regularities in economic development.

In our theory, a firm's productivity changes over time, generating the need to reallocate capital from previously productive firms to currently productive ones. Financial frictions hinder this reallocation process by limiting the amount of credit required for the expansion of newly productive firms. The degree of financial frictions is different across countries because countries differ in terms of the effectiveness with which credit contracts are enforced. In countries with ineffective contract enforceability, creditors are likely to have trouble recovering their loans. Knowing this, they

FIGURE 3

Average Establishment Size of Industries in the U.S. and Mexico



SOURCE: Buera, Kaboski and Shin.

will reduce the size of loans and demand larger collateral.

We discovered that financial frictions explain a substantial part of the above development regularities. Essentially, financial frictions distort the allocation of capital across firms and also their entry and exit decisions, lowering aggregate and sector-level TFP. While the use of internal funds or self-financing can alleviate the resulting misallocation, it is inherently more difficult to do so in sectors with larger scale and larger financing needs. Thus, sectors with larger scale (i.e., manufacturing) are affected disproportionately more by financial frictions. This explains the empirical findings of Rajan and Zingales.

The variation in financial development across countries can explain a factor-of-two difference in output per worker across economies, which is equivalent to almost 80 percent of the difference in output per worker between Mexico and the U.S. Consistent with the consensus view in the literature, the differences in output per worker in our model are mostly accounted for by the low TFP in economies with underdeveloped financial markets.

In our model economy, the impact of financial frictions is particularly large in the large-scale, manufacturing sector. While the sector-level TFP declines by less than 30 percent in services, it declines by more than 50 percent in manufacturing, a result broadly in line with the available sector-level productivity data shown in the right panel of Figure 2. The differential impacts of financial frictions on sector-level productivity are reflected on the higher relative prices of manufactured goods to services in financially underdeveloped economies.

Our analysis provides a clear decomposition of the main margins distorted by financial frictions. First, for a given set of firms in operation, financial frictions distort the allocation of capital among them (misallocation of capital). Second, for a given number of firms in operation, financial frictions distort firms' entry decisions, with productive-but-undercapitalized firms delaying their entry and unproductive-but-cash-rich firms remaining in business (misallocation of entrepreneurial talent). Third, financial frictions distort the number of firms operating in each sector. In our model economy, whereas the misallocation of capital is responsible for 90 percent of the effect of financial frictions on the service-sector TFP, it is the misallocation of entrepreneurial talent that accounts for more than 50 percent of the effect on the manufacturing-sector TFP.

The differential impacts of financial frictions across sectors in our model economy produce an interesting testable implication on the firm size distribution of each sector. Financial frictions, together with the resulting higher relative price of manufactured goods, lead to too few firms and too large firms in manufacturing, and too many firms and too small firms in services. To evaluate this implication, we perform a detailed case study of Mexico and the U.S., and find empirical support for it.

Figure 3 plots the average plant size in Mexico (defined as the number of employees, vertical axis) against the average plant size in the U.S. (horizontal axis) for 86 manufacturing industries and 12 service industries. The overall average plant size is substantially smaller in Mexico than in the U.S., almost by a factor of three. However, many industries (those lying above the 45-degree dashed line) have an average plant that is larger in Mexico than in the U.S. Indeed, the data have a slope (solid line) that is significantly steeper than the 45-degree line. That means that the industries that are large scale in the U.S. have an even larger scale in Mexico, while those that are small scale in the U.S. have an even smaller scale in Mexico. With the exception of administration/management services, those above the 45-degree line are manufacturing industries.

In summary, we developed a theory linking financial development to output per worker, aggregate TFP and sector-level relative productivity. Financial frictions distort the allocation of capital and entrepreneurial talent and have sizable adverse effects on macroeconomic outcomes. Based on these findings, we concluded that financial development, so long as it removes or alleviates such frictions, promotes economic growth in the long run.

Legal Origins and Financial Development

Empirical and theoretical analyses of finance and economic development across

countries naturally raise the following questions. Why are some countries more financially developed than others? Why don't less developed countries adopt or import more-advanced financial markets? Recent research on this topic finds answers in countries' institutions, especially their legal framework and rule of law.

For most countries, their overarching legal framework was either shaped long before the emergence of the modern finance-growth nexus or imposed on them through colonial rule. Legal scholars have categorized the laws that pertain to economic and financial contracts into four traditions: (English) common law, French civil law, German civil law and Scandinavian civil law. The scholars have found that common-law countries generally have the strongest, and French-civil-law countries the weakest, legal protections for investors, with German- and Scandinavian-civil-law countries in the middle. The strength of investor protection explains, in turn, a significant fraction of the differences in financial development across countries.[8]

This finding also explains why it may be difficult for countries to improve their financial markets, at least in the short term. Financial markets are governed by rules that are embedded into the institutional foundations of an economy, and such rules are persistent and sluggish by nature. A reform of financial markets, thus, likely presupposes an all-reaching, large-scale reform of the whole economy.

Policy Implications

Our analysis shows that, when the financial markets are not functioning properly, there is room for a government to intervene and improve upon the allocation of capital across firms. Indeed, this is one of the most cited justifications for industrial policy.

There are two important caveats. First, to repeat the popular refrain against industrial policy, governments cannot pick winners—that is, it is not clear whether governments, even with the best of intentions, can better identify who deserves more capital than can the market. Economic history shows that the odds are not in governments' favor. Second, it is hard to change policies that favor particular groups once those policies are instituted. A firm may well deserve the government's directed credit initially, but the firm will become over time either unproductive or sufficiently capitalized on its own. If the government cannot wean such undeserving beneficiaries from directed credit, the government's efforts only worsen the misallocation of capital in the long run.

The studies reviewed in this article suggest that governments aiming for financial development should focus on reforming bureaucratic and judicial procedures of the enforcement of economic contracts. With transparent and effective contract enforcement in place, financial development will follow.

Concluding Remarks

This article is not intended to be a wholesale defense of the financial sector. Rather, my goal is to remind us of the essential services that a developed financial sector provides for technological innovation and economic growth—mobilizing savings, evaluating projects, managing risk, monitoring managers and facilitating transactions, just as Schumpeter envisioned. We need to keep these essential services in mind as we rethink our regulatory and supervisory approaches in the wake of the financial crisis. Ω

Yongseok Shin is an economist at the Federal Reserve Bank of St. Louis. For more on his work, see http://research.stlouisfed.org/econ/shin/.

ENDNOTES

1. The Schumpeterian hypothesis had been much debated before then, but the relevant data required for an empirical analysis were not available before the late 1960s.
2. Joan Robinson argued, "By and large, it seems to be the case that where enterprise leads, finance follows." See p. 86 of her book in the references.
3. A firm's external dependence is defined as capital expenditures (investment) minus cash flow from operations, divided by capital expenditures. This reveals what fraction of a firm's investment is financed with internal funds (cash flow) and external funds. An industry's external dependence is then defined as the median value of the firm-level external dependence of all the firms in that industry. Rajan and Zingales further assume that an industry's external dependence is a technological feature of the industry and, hence, the external dependence of an industry computed from the U.S. data is common across all countries.
4. The external dependence in the data primarily depends on two factors. First, industry-level technologies are different in the lag between investment and revenue generation. It is longer in pharmaceuticals, in which it takes years of research and development to produce marketable new drugs. Tobacco firms, on the other hand, have a stable revenue stream that can more than pay for new investments. Second, in all industries, young firms have higher external dependence than mature firms, which can use the proceeds from their past investment to pay for current investment. It turns out that most pharmaceutical firms are young, and most tobacco firms are old.
5. Rajan and Zingales measured a country's financial development first in terms of the metric of King and Levine and then in terms of the degree of disclosure prescribed by each country's accounting standards.
6. Gross domestic product (GDP) is computed in international prices to account for the fact that the same goods and services are often cheaper in poor countries than in rich countries. Economists call this procedure "purchasing-power parity" (or PPP) adjustment. The data are for 1996 and come from Penn World Tables Version 6.1.
7. In the U.S., the average number of employees for a manufacturing establishment is 47, while it is 17 for a service establishment. Across all the Organisation for Economic Co-operation and Development member countries, the average manufacturing firm hires 28 employees and the average service firm 8.
8. See La Porta et al.

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Changes in the Racial Earnings Gap since 1960

By Maria Canon and Elise Marifian

Income inequality between races has been a widely used indicator of economic prosperity and opportunity (or the lack thereof) within the diverse population of the U.S. The Civil Rights Act of 1964 prohibited discrimination in public places, provided for the integration of schools and other public facilities, and made employment discrimination illegal, thus improving the quality of education and providing more job opportunities for African-Americans. Nevertheless, disparities remain. Labor economists have investigated various sources of earnings inequality in America since the act was passed; some economists have considered how the disparities in earnings change within and across regions of the country. Much of the research covers the 1960-2000 period; much less is known about racial inequality in earnings over the years since. Of particular interest might be the impact of the Great Recession on such inequality.

This article aims to provide insight into the recent trends in earnings inequality between black men and white men. We replicated the analysis in a 2006 study by Jacob Vigdor of the 1960-2000 period using census data and then examined disparities in annual earnings since then, using yearly American Community Survey data from 2000 to 2011.

Figures 1 (1960-2000) and 2 (2000-2011) present key results. The dotted line shows the percentage differential in earnings for Northern-born black males relative to Northern-born white males, holding constant other variables.[1] (For example, in 1960 Northern-born black males earned on average 40 percent less than their Northern-born white counterparts.) The solid line plots the same comparison between Southern-born blacks and whites. (Be aware that Northern-born and Southern-born does not necessarily mean that the men continued to live in the North or South, respectively.)

In Figure 1, we see that inequality declined among both the Northern-born and Southern-born from 1960 to 1970. Racial earnings inequality among the Northern-born increased markedly from 1970 to 1990 and remained relatively stable from 1990 to 2000. On the other hand, among the Southern-born, racial earnings inequality declined only slightly from 1970 to 1980 and increased slightly from 1980 to 2000. In 2000, black-white earnings inequality among the Northern-born was considerably greater than the level in 1960, while inequality among the Southern-born was reduced.

Much of the research covers the 1960-2000 period; much less is known about racial inequality in earnings over the years since. Of particular interest might be the impact of the Great Recession on such inequality.

Figure 2 shows the results for 2000-2011. The values for the Northern-born indicate that the economic situation of blacks (as measured by annual earnings) declined considerably relative to that of whites; in other words, earnings inequality continued to increase for those born outside the South.

Similarly, the percent differential in Southern-born blacks' annual earnings relative to Southern-born whites' worsened over the 2000-2011 period. Those blacks born in the South did not show evidence of converging faster with those blacks born in the North during this decade. In addition, the increases in slope magnitude from 2007 to 2010 indicate that during the Great Recession and in the year following, racial earnings inequality among the Southern-born increased even more than in previous years. Lastly, it is important to note that being a Southern-born black male corresponds with a greater wage differential relative to white counterparts than does being a Northern-born black male. For example, the results indicate that in 2011, the annual earnings of Southern-born black males were approximately 72 percent less than those of Southern-born white males, whereas Northern-born black males' 2011 earnings were 61 percent less than those of Northern-born white males.

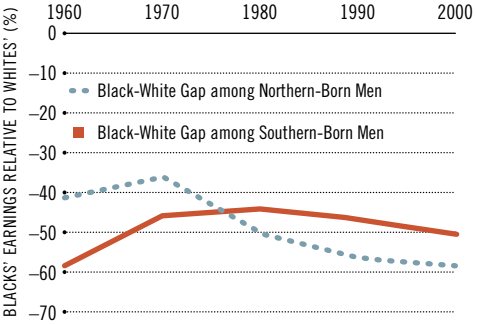
What driving forces can explain these trends?

Vigdor examined three hypotheses to understand why it appears that the South demonstrated more rapid progress than the North in reducing the earnings gap between blacks and whites from 1960 to 2000.[2] While each hypothesis seems to have had an effect at some point throughout the 40-year period, the results of his analysis suggest that much of the "improvement" in the racial wage gap in the South was merely a reflection of changing regional demographics—what he calls "selective migration"—and not of actual improvement in relative earnings for Southern-born blacks. The improvements were the result of blacks and whites of differing abilities moving from South to North and vice versa.

Vigdor's results indicate that selective migration accounted for 40 percent of the

FIGURE 1

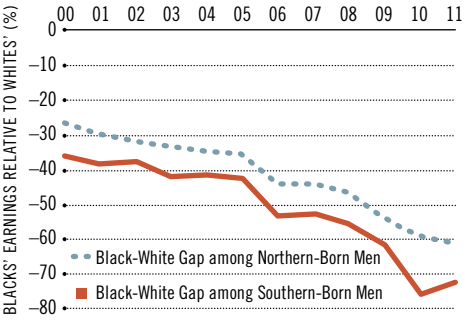
Relation among Race, Geography and Earnings: 1960-2000



NOTES: The percentages on the vertical axis indicate, for example, that Northern-born black men made in 1960 about 40 percent less than Northern-born white men. Samples are derived from the Integrated Public Use Microdata Series (IPUMS) census data on white and black males age 21-60 born in the 48 contiguous states. Individuals with zero earnings are assumed to have potential earnings below the median for their region/race cell and age. Samples are weighted using IPUMS weights where appropriate.

FIGURE 2

Relation among Race, Geography and Earnings: 2000-2011



NOTES: The percentages on the vertical axis indicate, for example, that Northern-born black men made in 2000 about 28 percent less than Northern-born white men. Being Northern-born or Southern-born doesn't necessarily mean that the men still live in the North or South, respectively. Samples are derived from the Integrated Public Use Microdata Series (IPUMS) American Community Survey data on white and black males age 21-60 born in the 48 contiguous states. Individuals with zero earnings are assumed to have potential earnings below the median for their region/race cell and age. Samples are weighted using IPUMS weights where appropriate.

South's relative improvement from 1960 to 2000 and all of the improvement from 1980 to 2000. More specifically, the black-white wage gap improved among Southern residents but not for those born in the South.

Other studies have attempted to explain the trends in earnings inequality between the races through 2000. A 2010 paper by Dan Black, Natalia Kolesnikova and Lowell Taylor considered the average annual weeks worked from 1970 to 2000 and found that this number declined for black men in each of the 14 cities examined, sometimes by as much as 25 percent, while the declines for white men were relatively smaller. At the same time, black men's weekly hours of work remained stable. Together, these two points suggest that the earnings decline was likely related to labor force attachment (manifested as a drop in the average number of weeks worked in a year) rather than to declines in the number of hours that black men were working. The authors found substantial declines in the proportion of black men employed, increases in the proportion of black men unemployed and even larger increases in the proportion of black men not in the labor force. In other words, black men's labor force trends from 1970 to 2000 help explain why their average annual weeks worked declined and why their total annual earnings declined relative to those of white men.

Yet can these studies by Vigdor and by Black et al. explain the behavior in racial earnings gaps over the 2000-2011 period? While Vigdor argued that selective migration explained the South's improvement in racial earnings inequality relative to the North's, recent research by Greg Kaplan and Sam Schulhofer-Wohl suggests that interstate migration has been decreasing. In other words, the selective migration story observed in previous decades would no longer apply.

An alternative explanation for the increased racial inequality could be that African-American men were disproportionately hit by the Great Recession. Their unemployment rate increased from 8.5 percent to 15.4 percent between December 2007 and December 2011. In comparison, the unemployment rate of white men rose from 3.9 percent to 7.1 percent over the same period.[3] Given these unemployment rates, it is no surprise that for both Southern-born and Northern-born blacks, earnings declined relative to whites during the Great Recession. Furthermore, the fact that the labor force attachment for African-Americans has decreased even more since the Great Recession might help explain the increase in the earnings gap since 2009. Ω

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ENDNOTES

1 Vigdor uses the term "North" to refer to Census Bureau regions other than the South. Therefore, the "North" in his study comprises the Northeast, Midwest and West regions.

2 His second hypothesis is that changes in regional labor markets, following the Civil Rights legislation and the manufacturing decline in the North, improved Southern blacks' economic prosperity. His third hypothesis is that the South's progress in reducing the black-white earnings gap from 1960 to 2000 could be a consequence of greater educational attainment among blacks, following desegregation and the reduction of racial disparity in education.

3 The unemployment rate data are for black men age 20 and over, seasonally adjusted, and white men age 20 and over, seasonally adjusted, from the U.S. Bureau of Labor Statistics/Haver Analytics.

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Europe May Provide Lessons on Preventing Mortgage Defaults

By Juan Carlos Hatchondo, Leonardo Martinez and Juan M. Sánchez

It is well-known that house prices declined sharply and mortgage defaults increased abruptly from 2006 to 2010 in the U.S. In Europe, where mortgage regulations are significantly different, the behavior of house prices and mortgage defaults displays somewhat different dynamics. Comparing the experiences in these two regions sheds light on the impact of alternative regulations.

Figures 1 and 2 show the evolution of house prices and mortgage defaults in the U.S. and Europe, respectively. To facilitate the comparison, both series are normalized to 100 in 2007. In the U.S., house prices declined about 20 percent during this period, and defaults increased by about 300 percent.[1] In Europe, house prices declined much less, slightly more than 5 percent, while mortgage defaults increased little, about 26 percent from trough to peak, 2007-2010.[2] Given that changes in prices and defaults are different, it is hard to compare the experiences in Europe and the U.S. directly. Here, this problem is dealt with by comparing changes in defaults for periods in which the changes in prices were similar in the two regions.

The first panel of the table compares changes in mortgage defaults in Europe and the U.S. for periods when the change in prices was similar. From 2008 to 2009, prices declined almost 7 percent on average in Europe. As a response, default rates increased, but only by 11 percent. In the U.S., from 2007 to 2008, house prices declined on average by almost 8 percent. The corresponding increase in mortgage defaults was much larger: more than 93 percent.

Why would there be such a difference in the response of mortgage defaults to almost-equal changes in house prices? A 2011 report by the International Monetary Fund (IMF) points to two regulations used in Europe to prevent mortgage defaults, one implemented to a limited extent in only some states of the U.S. and the other implemented on a much less restrictive basis across the U.S.

The first regulation gives homeowners in Europe more responsibilities after default than most U.S. homeowners face. In Europe, mortgages are recourse loans, meaning that, after default, borrowers are responsible for the difference between the value of the outstanding debt and the value of the house. Consider this hypothetical case: If Jaime bought a house in Spain for €500,000 in 2007 and defaulted in 2010 when he still owed €450,000 but the house was worth only €400,000 then, under recourse laws he is responsible for €50,000.

This policy increases the cost of default, which makes it less appealing to the homeowner. In most of the states in the U.S., mortgages are, in practice, nonrecourse. Even when recourse is allowed, the deficiency judgment (the difference between the loan and house value) could be discharged in bankruptcy.

The second policy in Europe limits the amount that households can borrow using their house as collateral. Some European countries have limits on loan-to-value (LTV) ratios of 80, 85 or 90 percent. For example, if the LTV limit is 80 percent, an owner of a house worth €500,000 cannot borrow (using the house as collateral) more than €400,000. As a result of this policy, households have more home equity. More equity means that fewer mortgages end up underwater when house prices drop. As a result, the default rate is lower in Europe. In the U.S., LTV policies are much less restrictive.

The impact of the recourse and LTV policies is illustrated in the rest of the table.

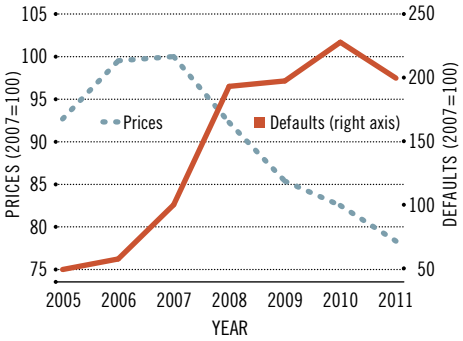
The second panel of the table compares the dynamics of house prices and defaults in states with recourse laws to those in states without recourse laws.[3] We compare different periods to evaluate the change in mortgage defaults given similar changes in house prices. From 2007 to 2010, house prices declined by about 9 percent in recourse states, while the default rate increased by about 217 percent. A very similar change in prices—about 10 percent—is observed for nonrecourse states between 2007 and 2008; for that group, defaults rose about 186 percent, similar to what was observed in recourse states. The lesson here is that recourse as designed and implemented in the U.S. has little effect on the default rate on mortgages.[4]

As mentioned above, to understand why recourse does not have as much effect on default rates in the U.S. as it does in Europe, one has to look at the interaction of recourse laws in the U.S. with Chapter 7 bankruptcy. In a 2009 paper, economists Wenli Li and Michelle White estimated the probability of bankruptcy for homeowners with mortgages and found that the probability of filing bankruptcy was about 25 times greater if the mortgage creditor had begun foreclosure within the previous three months than if the mortgage creditor had not done so.[5]

The third panel of the table illustrates that recourse in Europe does play an important role in preventing defaults. The panel compares a group of U.S. states with a group of European countries; both groups have recourse policies but no LTV policies.[6] The main difference between these two regions is how recourse regulations are actually implemented, in particular, the fact that Chapter 7 bankruptcy restricts the role of recourse in

FIGURE 1

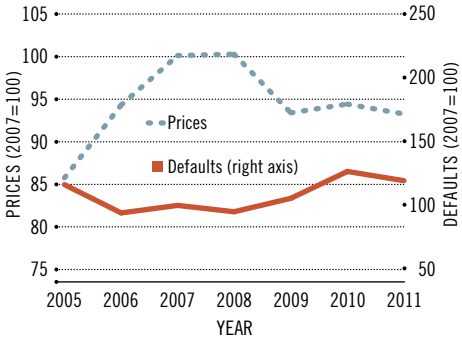
Prices vs. Defaults U.S.



SOURCE: Zillow Real Estate Research.

FIGURE 2

Prices vs. Defaults Europe



SOURCES: Prices from International House Price Database provided by the Federal Reserve Bank of Dallas. Defaults from Eurostat.

the U.S. because a U.S. household can usually discharge that obligation in bankruptcy. Over roughly the same time period, house prices in each group declined about the same amount, but the increase in default rates was very different: about 14 percent in Europe and about 217 percent in the U.S. This suggests that recourse, when designed and implemented as in Europe, plays an important role in preventing defaults.

Limiting the amount of debt taken by homeowners seems important, too. The last panel of the table compares European countries with and without LTV limits. Over the same period, each group experienced roughly the same decline in house prices (about 10 percent). However, the default rate increased only slightly in countries with an LTV limit, while it increased by more than 14 percent in countries without such a limit.

At the Federal Reserve Bank of St. Louis, a life-cycle model in which households make housing and financial decisions is being built.[7] The model reproduces many features of U.S. mortgage and housing markets. That artificial economy can be used to simulate the effect of implementing limits on LTV and recourse in the U.S. economy. Hopefully, the results will shed light on the pros and cons of implementing these policies. Ω

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The Role of Recourse and LTV Limits in Preventing Mortgage Defaults

PANEL 1	Europe	U.S.
Period	2008-2009	2007-2008
Decline in prices	6.8%	7.7%
Increase in defaults	11.0%	93.2%
PANEL 2	**U.S. recourse states**	**U.S. nonrecourse states**
Period	2007-2010	2007-2008
Decline in prices	8.7%	10.1%
Increase in defaults	216.6%	186.2%
PANEL 3	**U.S. recourse states**	**Europe, non-LTV-limit countries**
Period	2007-2010	2007-2009
Decline in prices	8.7%	10.2%
Increase in defaults	216.6%	14.4%
PANEL 4	**Europe, LTV-limit countries**	**Europe, non-LTV-limit countries**
Period	2007-2009	2007-2009
Decline in prices	8.6%	10.2%
Increase in defaults	3.5%	14.4%

SOURCES: Zillow Real Estate Research, Federal Reserve Bank of Dallas, Eurostat, Ghent and Kudlyak, and Global Financial Stability Report by the International Monetary Fund.

ENDNOTES

1. For prices and defaults for the U.S., we used data provided by Zillow Real Estate Research. "Prices" are from the Zillow Home Value Index for all homes, and "defaults" are foreclosures per 10,000 homes.
2. These data are an average of prices and defaults for seven European countries with available data from 2005 to 2010. Prices were obtained from the International House Price Database provided by the Globalization and Monetary Policy Institute of the Federal Reserve Bank of Dallas. Defaults are actually "arrears on mortgage or rent payment" provided by Eurostat. A more comparable concept in the U.S. is "mortgage delinquencies." Growth rates of mortgage delinquencies and foreclosures in the U.S. were similar during this period.
3. States are grouped according to their recourse policies, using the recourse classification from the 2011 paper by Andra C. Ghent and Marianna Kudlyak. The states without recourse policies for which we also have price and default data are Arizona, California, Minnesota, Oregon, Washington and Wisconsin. The states with recourse policies that we used are Alabama, Arkansas, D.C., Maryland, Massachusetts and Missouri. These are the recourse states that take the shortest time to resolve a foreclosure.
4. See Clauretie. This view, however, is challenged by Ghent and Kudlyak, using household-level data on mortgage characteristics.
5. In a related 2011 paper, Kurt Mitman models differences in bankruptcy and nonrecourse laws across U.S. states.
6. The countries that are considered in Europe are Denmark, France, Ireland, Italy, the Netherlands, Spain and the United Kingdom. The data on loan-to-value ratio limits are obtained from the IMF report mentioned above. Countries with maximum LTV on new loans smaller than 100 percent are considered as countries with LTV limits. In our sample, only Denmark and Italy belong to this group.
7. See Hatchondo, Martinez and Sánchez (2011).

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Mortgage Applicants Turn to Credit Unions after the Crisis

By Yang Liu and Rajdeep Sengupta

The origins of the recent financial crisis have often been traced to the excesses in the U.S. mortgage market. Most accounts of the crisis tend to focus on a significant decline in underwriting standards for mortgages since 2000. After the crisis, the pendulum appears to have swung in the other direction. Anecdotal evidence suggests that borrowers are finding it difficult to obtain housing loans. Some observers have remarked that this difficulty may be one of the causes of the slump in the U.S. market for housing.

Using a data set of loan applications and originations, we analyzed these trends for the Federal Reserve's Eighth District, based in St. Louis.[1] Our data came from the Home Mortgage Disclosure Act (HMDA) files for 2004, 2009 and 2010.[2] The HMDA data for 2004 were used as an indicator of the precrisis mortgage market conditions, whereas HMDA data for 2009-2010 were used to indicate postcrisis mortgage conditions. We restricted our observations to first-lien, one- to four-family home mortgage loans.

As expected, the data show that the financial crisis adversely affected the demand for mortgage loans in the District. Figure 1 displays a panel of scatter plots showing pre- and postcrisis mortgage applications in each county of the District. The horizontal axis of each plot measures the level of 2004 mortgage loan applications, while the vertical axis measures the annual average of 2009-2010 mortgage loan applications. Each dot in the chart represents one of the 339 counties. The plot also shows the 45-degree line where the level of 2004 applications equals the annual average of 2009-2010 applications. Simply put, a dot below the 45 degree line indicates that postcrisis applications for that county were fewer than precrisis applications; a dot above indicates the opposite.

For the District, there were 290,091 fewer mortgage applications annually during 2009-2010 than in 2004 (a reduction of 33.3 percent). Figure 1A shows that 327 out of the 339 counties in the District were located below the 45-degree line—a widespread drop in mortgage applications across the District.

> Although further research is needed … some anecdotal evidence may explain this rapid growth in the popularity of credit unions.

The drop was greater for new purchases (Figure 1B) when compared with refinances (Figure 1C). Annual applications for purchases fell by 47.3 percent (139,707 applications) after the crisis; 319 counties experienced a decline in purchase applications. In contrast, applications for refinances fell by 25.3 percent (138,634 applications); 307 counties experienced a decline in refinance applications. Clearly, the drop in numbers was roughly the same for both purchases and refinances, but purchases constituted a smaller proportion of applications near the peak of the boom in 2004.

Interestingly, HMDA data also allowed us to sort the applications by the agency that supervises each lending institution to which the application is made. Since different agencies supervise different types of lending institutions, we could use this variable to examine the differences in pre- and postcrisis applications by lending institutions. We sorted loan data by three different types of financial institutions: banks and thrifts, credit unions and "HUD-supervised mortgagees." This last category denotes loans made by institutions that are not supervised by any of the major agencies.[3]

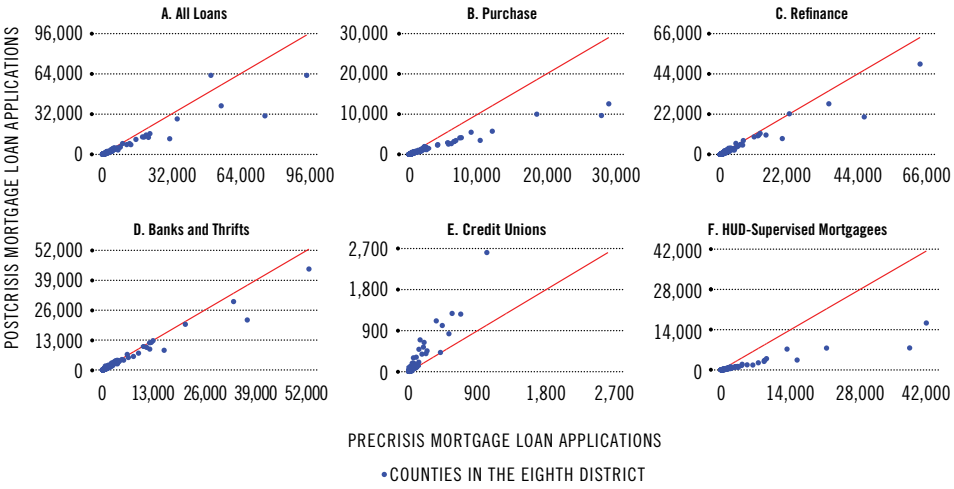
Banks and thrifts in the District experienced a moderate decrease in annual mortgage applications of 14 percent (or 71,738 applications) after the crisis (Figure 1D). Consumers filed fewer mortgage application loans to banks and thrifts in 252 counties. HUD-supervised mortgagees suffered the largest loss in mortgage loan applications on an annual basis (Figure 1F). They received 229,219 fewer loan applications, or a decline of 65.5 percent. In all but one of the District's counties, consumers filed fewer mortgage loan applications to HUD-supervised mortgagees. It is important to point out that the reduction of 229,219 applications in this sector accounted for 79 percent of the annual loan application decline in the District.

In contrast, credit unions enjoyed a surprising boom in home mortgage applications (Figure 1E). On an annual basis, mortgage applications rose by 10,813—an increase of 122 percent. Of the 275 counties in the District that recorded loan applications filed with credit unions, 222 counties recorded an increase in applications. Furthermore, annual applications increased by more than 100 percent in 123 District counties.

Although further research is needed to account for this rapid and anomalous increase, some anecdotal evidence may explain this rapid growth in the popularity of credit unions. First, there has been

FIGURE 1

Mortgage Loan Applications in the Eighth District Pre- and Postcrisis

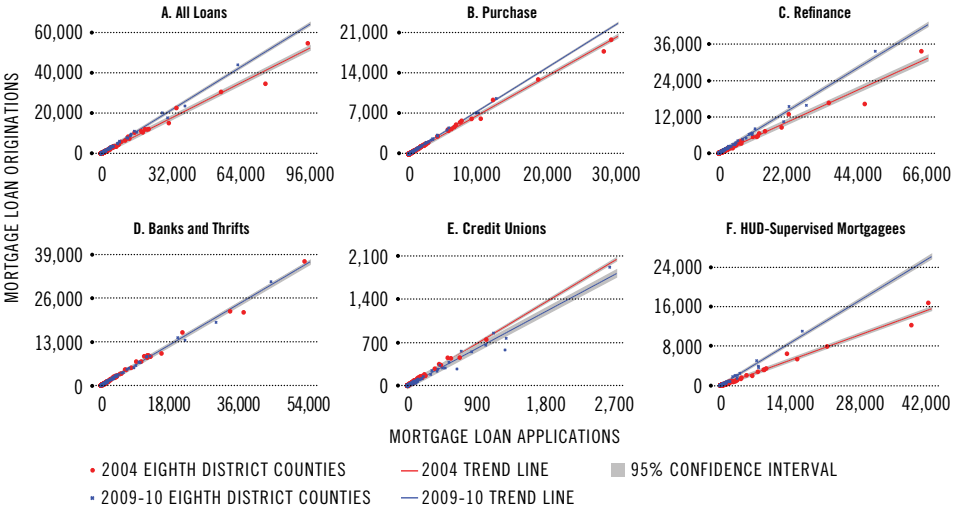


In Figure 1, the horizontal axis of each panel shows the level of 2004 mortgage loan applications, while the vertical axis shows the annual average of 2009-2010 mortgage loan applications. Each dot in the chart represents one of the 339 counties in the District. The plot also shows the 45-degree line where the level of 2004 applications equals the annual average of 2009-2010 applications. Simply put, a dot below the 45-degree line indicates that postcrisis applications for that county were fewer than precrisis applications; a dot above indicates the opposite.

Figure 2 displays a panel of scatter plots showing pre- and postcrisis mortgage origination vis-à-vis applications for each county of the District. The horizontal axis shows the number of applications in the county, while the vertical axis measures the number of originations. The dots in red show the 2004 levels for each county, while the blue dots show the annual average for 2009-2010 in the same counties. The red and blue lines are the corresponding lines of fit for each period. A higher line indicates a higher origination rate for a given level of applications.[10]

FIGURE 2

Mortgage Loan Applications vs. Originations in the Eighth District



record growth in the membership of credit unions—much of this has been attributed to consumer disillusionment with big banks.[4] Moreover, a large share of the growth in mortgage business is concentrated among the largest credit unions—which typically have lower limits on membership.[5] Second, at least two of these large credit unions have reportedly been offering members mortgages without requiring any down payment or mortgage insurance.[6]

To find out how loan-approval patterns in 2009-2010 differed from those in 2004, we examined the mortgage loan origination rate during the two periods. Figure 2 displays a panel of scatter plots showing

ENDNOTES

1 The Eighth Federal Reserve District includes all of Arkansas and portions of Illinois, Indiana, Kentucky, Mississippi, Missouri and Tennessee.

2 In what follows, we use the annual average for the 2009-2010 HMDA data. However, the choice of years for pre- and postcrisis indicators is ad hoc.

3 The major supervisory agencies include the Federal Reserve System, Federal Deposit Insurance Corp., Office of the Comptroller of the Currency, Office of Thrift Supervision and National Credit Union Administration.

4 See Prevost.

5 Credit unions are nonprofit depository institutions that are democratically controlled by their members. Membership in a credit union is usually limited by law and is organized around a common bond or "field of membership."

6 See Morrison.

7 The term "origination" here implies the actual disbursement of funds upon approval of the mortgage application. All originations require approval of the mortgage application. However, not all approved applications lead to originations since the borrower can still reject the terms of the loan.

8 A "line of fit" (shown in Figure 2) is a line that is drawn through the data on a scatter plot to describe the trend of the data. This is different from the 45-degree line in Figure 1.

9 A word of caution is in order here: While the plots include confidence intervals for the lines of fit, stricter criteria may not reveal statistically significant differences between the lines of fit in some of the plots. Nevertheless, this remains a simple and useful way to distinguish between pre- and postcrisis origination rates.

10 The majority of the dots and crosses overlap in the lower left of each figure.

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pre- and postcrisis mortgage origination vis-à-vis applications for each county of the District. The horizontal axis of each plot shows the number of applications in the county, while the vertical axis measures the number of originations.[7] The dots in red show the 2004 levels for each county, while the blue dots show the annual average for 2009-2010 in the same counties.

We plotted the corresponding "line of fit" for each period.[8] A higher line indicates a higher origination rate for a given level of applications.[9] At first glance, therefore, it is surprising that the postcrisis line of fit in almost all plots of Figure 2 appears higher than the precrisis trend lines. A possible explanation of this feature of the data is that although there are fewer applications postcrisis, their quality is significantly better. This may be partly due to the fact that real-estate salesmen are only willing to do business with preapproved buyers.

Figure 2 reveals two important patterns. First, the differences in origination rates for refinances (Figure 2C) appear to be greater than those for purchases (Figure 2B). Refinancing after a sharp decline in home prices can be tricky because existing homeowners would likely have to cover for the shortfall in home equity if they wanted to take advantage of lower mortgage rates. While this reduces the set of applicants, it can also ensure an improvement in the applicant pool, thereby resulting in higher origination rates.

Second, among all lending institutions, only credit unions' loan origination rates show a marginal decline (Figure 2E), primarily due to smaller origination growth relative to a larger increase in applications. In light of the anecdotal evidence given above, a possible explanation is that a significant increase in annual mortgage applications made credit unions more selective. Ω

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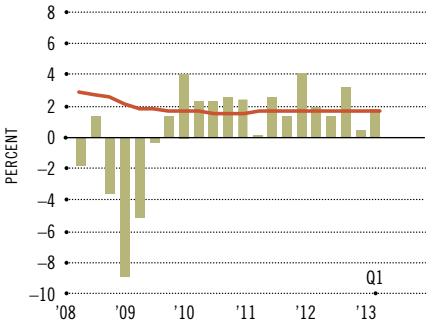
ECONOMY AT A GLANCE

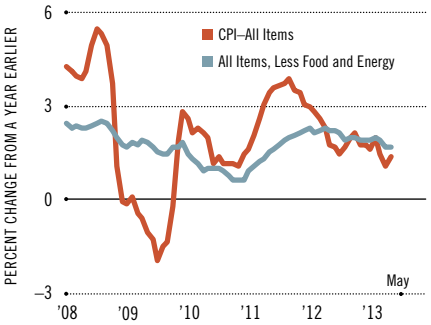
Eleven more charts are available on the web version of this issue. Among the areas they cover are agriculture, commercial banking, housing permits, income and jobs. Much of the data are specific to the Eighth District. To see these charts, go to www.stlouisfed.org/economyataglance.

REAL GDP GROWTH

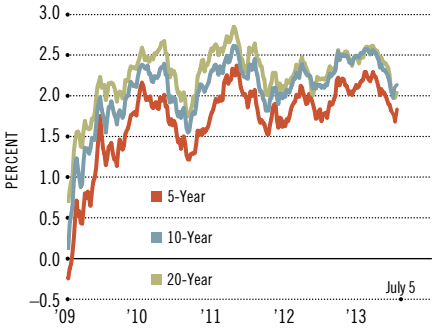


NOTE: Each bar is a one-quarter growth rate (annualized); the red line is the 10-year growth rate.

CONSUMER PRICE INDEX (CPI)

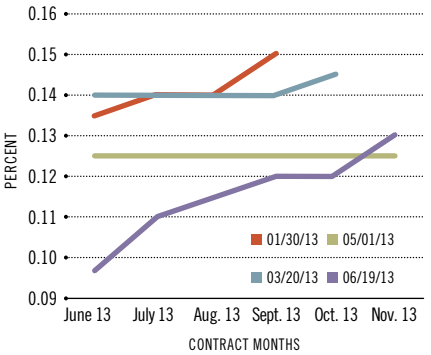


INFLATION-INDEXED TREASURY YIELD SPREADS



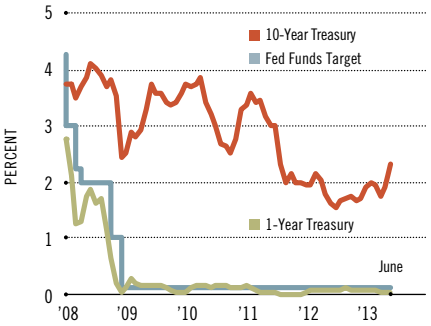
NOTE: Weekly data.

RATES ON FEDERAL FUNDS FUTURES ON SELECTED DATES



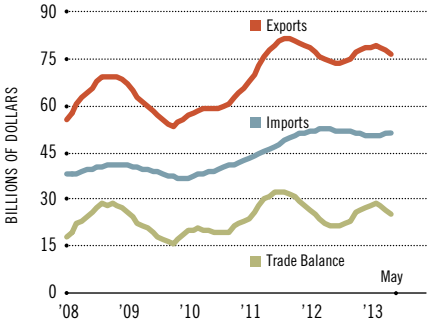
CIVILIAN UNEMPLOYMENT RATE

INTEREST RATES



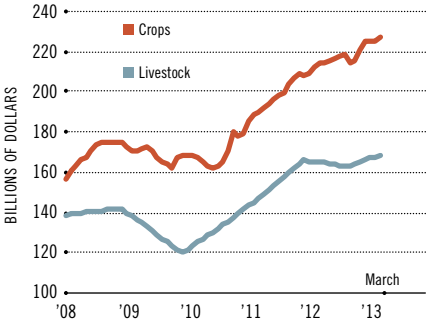
NOTE: On Dec. 16, 2008, the FOMC set a target range for the federal funds rate of 0 to 0.25 percent. The observations plotted since then are the midpoint of the range (0.125 percent).

U.S. AGRICULTURAL TRADE



NOTE: Data are aggregated over the past 12 months.

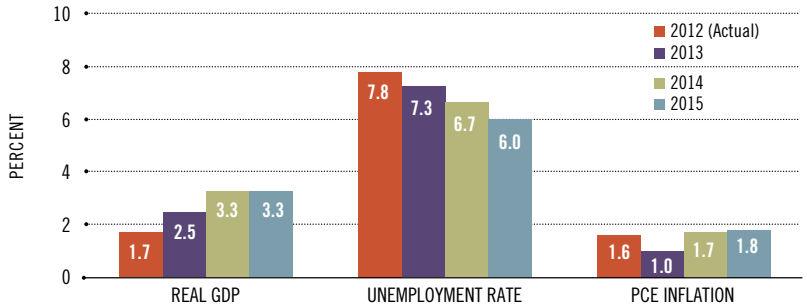
FARMING CASH RECEIPTS



NOTE: Data are aggregated over the past 12 months.

Mixed Signals, but Moving Forward

By Kevin L. Kliesen



SOURCE: Board of Governors of the Federal Reserve System.
NOTES: Projections are the midpoints of the central tendencies. The actual and projected unemployment rates are for the fourth quarter. The growth of gross domestic product (GDP) and personal consumption expenditures (PCE) is the percentage change from the fourth quarter of the previous year to the fourth quarter of the indicated year.

Despite pockets of strength, the U.S. economy continues to struggle to build consistent momentum. Real GDP growth rebounded in the first quarter of 2013 after ending 2012 on a relatively weak note. Real GDP grew at a 0.4 percent annual rate in the fourth quarter but then sped up to a modest 1.8 percent annual rate in the first quarter. The momentum swing in the first quarter, though, was not expected to carry into the second quarter. According to the May *Survey of Professional Forecasters*, real GDP growth was expected to slow to about 1.75 percent in the second quarter before rebounding to an average of about 2.5 percent over the second half of this year.

Housing's Strength Spreads

Breaking down the GDP data indicates that housing continues to be a source of strength. Through the first five months of 2013, new and existing home sales, as well as housing permits, posted double-digit annualized growth rates compared with the same period in 2012. Moreover, house prices rose sharply, boosting the confidence of home builders. By contrast, commercial construction exhibited much less vigor.

Brisk gains on the housing front are beginning to boost other segments of the economy. For example, the housing boom appears to be triggering an upswing in household spending. Through the first four months of 2013, sales of household furnishings and durable equipment like appliances increased at about a 3.5 percent annual rate—much stronger than the 1.9 percent growth in total personal consumption expenditures. Elsewhere, automotive manufacturers have boosted production of light trucks, which are used extensively in the construction industry.

The rebound in consumer spending, at first glance, is perhaps not too surprising, given other key developments. First, consumer confidence and household wealth rose sharply over the first half of 2013. Second, gains in private-sector jobs averaged a little more than 200,000 per month over the first six months of 2013.

However, other factors were working in the opposite direction. These include the payroll tax increase in January, higher gasoline prices over the first half of the year, tepid growth of real average hourly earnings over the past few years and the relatively high levels of long-term unemployment. These factors may help explain some of the unexpected softness in total consumption spending that occurred in April and May.

Despite healthy profit margins and a relatively low cost of capital, real business fixed investment increased at just a 0.4 percent annual rate in the first quarter and was up only 3.7 percent from four quarters earlier. Similar to April's weak consumption data, production of business equipment fell by 0.5 percent in April. However, there are signs that business investment is picking up, as new orders to manufacturers for capital goods increased strongly in April and May.

Thus, consistent with most forecasts, the data point to modest growth in the second quarter. Moreover, with abundant levels of cash on corporate balance sheets, it appeared that many firms still harbored a considerable amount of uncertainty about the near-term outlook. Financial market conditions, though, remain healthy, according to the St. Louis Fed's Financial Stress Index.

Few Worries on the Inflation Front

Reflecting a notable slowing in food price gains and sizable drop in consumer energy costs, headline inflation has been exceptionally modest thus far in 2013. Through the first five months of the year, the consumer price index (the headline version, which factors in food and energy) increased at only a 0.7 percent annual rate—about 1 percentage point slower than for the same five-month period in 2012. Core inflation (excluding food and energy) also slowed relative to last year, but by not as much as the headline inflation rate. Over the first five months of 2013, the core consumer price index (CPI) advanced at a 1.8 percent annual rate, 0.5 percentage points slower than last year's gain over the same period.

Blue Chip forecasters don't expect these exceptionally low levels of inflation to persist: The headline CPI is projected to increase at about a 2 percent annual rate over the second half of this year. But, signals from the bond market suggest that longer-term inflation concerns appear relatively muted. In early June, yields on inflation-sensitive 30-year Treasury securities remained well below their peak of 4.9 percent (in early April 2010) during this business expansion.

On balance, stable inflation expectations and a lessening of some of the uncertainties and headwinds that have hampered hiring and business investment the past year or more should lead to faster growth and low inflation going forward. Indeed, this is the takeaway from the latest economic projections of the Federal Open Market Committee. (See chart.) Ω

Kevin L. Kliesen is an economist at the Federal Reserve Bank of St. Louis. Lowell R. Ricketts, a senior research associate at the Bank, provided research assistance. For more on Kliesen's work, see http://research.stlouisfed.org/econ/kliesen/.

METRO PROFILE

Welcome to the Metro Profile. This new feature replaces the long-running Community Profile. In each issue, we will focus on one of the more than 20 metropolitan statistical areas in the District, using data to explain what drives the economy of that MSA. For the most part, the data come from FRED® (Federal Reserve Economic Data), the online economic database of the St. Louis Fed. Some of the information in these articles is also anecdotal, provided by business contacts for use (anonymously) in our economic reports, such as the *Beige Book* and *Burgundy Books*.

Let us know what you think about Metro Profile. Submit your comments in a letter to the editor at www.stlouisfed.org/publications/re/letter.cfm. You can also mail a note to the editor, Subhayu Bandyopadhyay, at the Federal Reserve Bank of St. Louis, Box 442, St. Louis, MO 63166-0442.

Louisville Successfully Transitions from Industrial to Service Economy

By Charles S. Gascon and Sean P. Grover

The Louisville-Jefferson County, Ky.-Ind., metropolitan statistical area (known informally as the Louisville MSA) is the largest MSA in Kentucky and the third-largest MSA in the Federal Reserve's Eighth District. The Louisville MSA has a population of 1,251,351 and a labor force of 643,271. The per capita personal income was $39,037 in 2011 (the most recent year for which data are available), about 6.1 percent less than that for the U.S.

See the accompanying figures for perspective on the data cited in this article; the table and charts also include *additional* data that help tell the story about Louisville's economy.

In the postrevolutionary U.S., Louisville was an important western outpost. Situated at the Falls of the Ohio, Louisville became a key port for the western frontier. Similar to its inland-port contemporaries, such as Cincinnati and St. Louis, Louisville had an industrial river economy in the beginning; growth was driven by heavy manufacturing, shipping and trade. Louisville also gained attention for its bourbon whiskey, Louisville Slugger baseball bats and Kentucky Derby, cultural hallmarks that live strong today.

Postwar Louisville saw a movement away from heavy manufacturing and away from river trade, as production processes and labor needs changed across the country. Coupled with deurbanization and population loss, Louisville's economic transition was typical of that of industrial cities. Atypical was Louisville's ease of adapting to a modern postindustrial service economy.

As it stands today, the city is a particularly strong hub for the health-care and food-service industries. Logistics and distribution, as well as recently expanding manufacturing, are other industries of note.

This economic transition also helped dampen urban population loss experienced in similar cities and even helped garner healthy population growth in recent years.

Over the past 10 years (2002-2012), Louisville's population increased by 9.7 percent, noticeably faster than Kentucky's growth of 7.1 percent and just above the national rate of growth, 9.1 percent. Within the metro area, Jefferson County, Ky., holds a substantial majority of Louisville's population: about 60 percent of the total. In the past decade, there has been some shift in the population: Jefferson County grew 7.3 percent, while Clark County, Ind., the second-largest county in the MSA, grew at almost twice the rate: 14.3 percent.

Much of the MSA's growth over the period can be attributed to Kentucky-based counties surrounding the city. Spencer, Shelby and Oldham counties grew the fastest, with rates of 31.7, 25.5 and 24.7 percent, respectively, between 2002 and 2012. These three counties largely outpaced population growth in Kentucky and the nation. As a result of this growth, Spencer, Shelby and Oldham counties gained about 1.7 percent of Louisville's population; today, about 10 percent of the population is located in these three counties.

Economic Drivers

Humana, a managed-health-care company on the Fortune 100 list, has headquarters in downtown Louisville. By revenue, Humana is the largest publicly traded company based in town. With 11,000 local employees, it is the second-largest Louisville company by local employee count.

Six of Louisville's 10 largest employers

operate in the health-care industry; they range from insurance companies to hospitals. Norton Healthcare and Kentucky-One Health are two other companies of note, with 9,658 and 5,898 local employees, respectively, as of July 2012. Helped by the strong research atmosphere stemming from the University of Louisville and the region's early advances in heart transplants, Louisville's health-care industry has consistently driven economic growth.

Education and health-services payroll employment, which comprises about 14 percent of total nonfarm employment, has seen largely positive growth over the past decade. Between January 2003 and January 2013, employment in education and health services increased by 14,300 (5,500 in the narrower health-services industry), while total payroll employment in Louisville increased by about 26,000 jobs.

Several international restaurant brands also call Louisville home. The most notable is Yum Brands, owner of KFC, Pizza Hut, Taco Bell and WingStreet, making it the largest fast-food restaurant company in the world. By revenue, Yum Brands is the second-largest publicly traded company headquartered in Louisville and employed 1,558 workers locally, as of July 2012. Papa John's pizza has also become an international brand and is a top local employer, as is the restaurant chain Texas Roadhouse. In the food industry, however, employment in the corporate headquarters of these restaurant companies falls under professional and business services employment, which comprises about 12 percent of Louisville's total nonfarm employment.

One other economic driver of note is the air-freight arm of United Parcel Service, UPS Airlines. Although its parent company calls Atlanta home, UPS Airlines is based in Louisville. Because of this presence, UPS is the largest local employer, with a July 2012 local employee count of 20,117, nearly twice the amount of the runner-up, Humana. This employment presence has driven the growth in the region's transportation sector, which employs about 3 percent of the MSA's workers. Between January 2003 and January 2013, payroll employment in the transportation sector increased by 1,600 jobs, or 6.4 percent of total employment growth over this period.

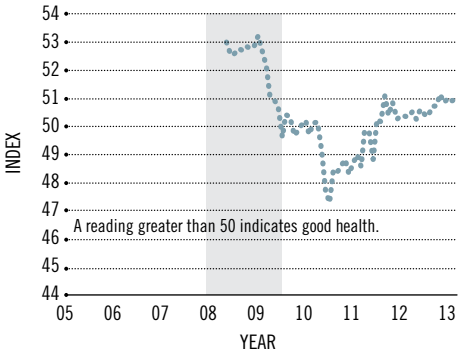
Louisville's location at a nexus of transportation systems has made it a trade and distribution hub throughout its history. As such, the Logistics and Distribution Institute at the University of Louisville keeps the national LoDI Index, which gauges the health of logistics and distribution activity. The most recent reading showed 51, indicating a healthy amount of logistics and distribution activity (greater than 50 indicates good health), which is generally viewed as a positive sign for the economy.

Current Conditions

In the postrecession years, Louisville's nonfarm payroll employment growth has typically been on track with the nation's. However, Louisville has seen increases in the last year that have outpaced those of the U.S. As of March 2013, year-over-year growth in nonfarm employment doubled the national rate of 1.5 percent. This 3 percent growth translates to an increase of 18,800 jobs over

FIGURE 1

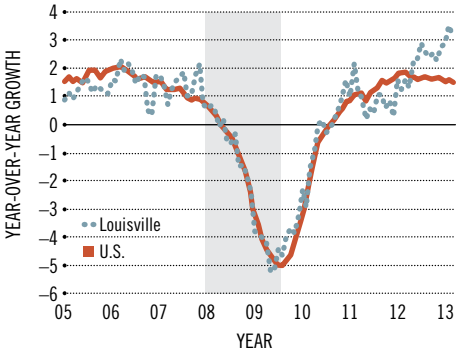
Logistics and Distribution Index



NOTE: Data are from the University of Louisville and are easily accessible in the St. Louis Fed's economic database, FRED, using this series ID: LODINIM066N. Gray shading in all figures indicates recession period.

FIGURE 2

Nonfarm Payroll Employment



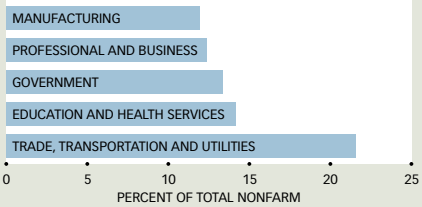
NOTE: Data are from the U.S. Bureau of Labor Statistics and are easily accessible in the St. Louis Fed's economic database, FRED, using these series IDs: Louisville (LOINA) and US (PAYEMS).

MSA Snapshot

Louisville-Jefferson County, Ky.-Ind. (MSA)

Population	1,251,351
Labor Force	643,271
Unemployment Rate	7.8%
Personal Income (per capita)	$39,037

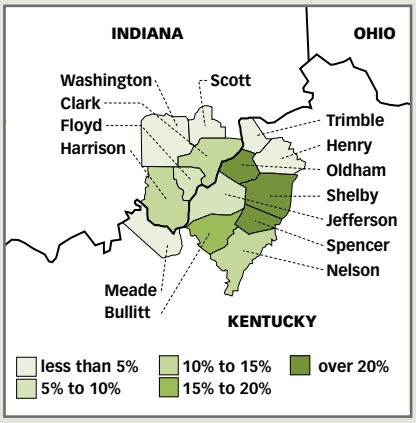
LARGEST SECTORS BY EMPLOYMENT



LARGEST LOCAL EMPLOYERS

1. United Parcel Service Inc.
2. Humana Inc.
3. Norton Healthcare Inc.
4. Ford Motor Co. Kentucky Truck Plant
5. KentuckyOne Health Inc.

POPULATION GROWTH BY COUNTY 2002-12



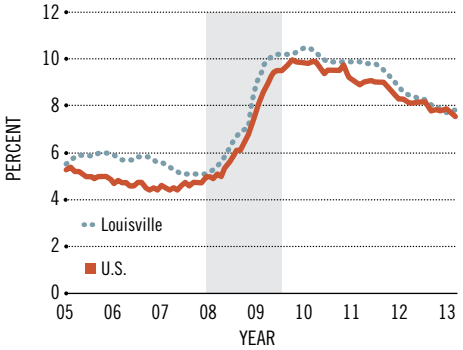
NOTES: Population and employment are from the U.S. Census Bureau and U.S. Bureau of Labor Statistics and are easily accessible in the St. Louis Fed's economic database, FRED. For the first two panels and map, see these FRED series (IDs are in parentheses): Population (LOIPOP); Labor Force (LOILF); Unemployment Rate (LOIUR); Personal Income (LOIPCPI); Manufacturing (LOIMFG); Professional and Business (LOIPBSV); Government (LOIGOVT); Education and Health (LOIEDUH); and Trade, Transportation and Utilities (LOITRAD). Data for the employers panel are as of July 2012 and come from the *Louisville Business Journal* Book of Lists.

For your convenience, key data that pertain to the Eighth District have been aggregated on a special web page at https://research.stlouisfed.org/regecon/.

To see all that FRED offers, go to http://research.stlouisfed.org/fred2/.

FIGURE 3

Unemployment Rate



NOTE: Data are from the U.S. Bureau of Labor Statistics and are easily accessible in the St. Louis Fed's economic database, FRED, using these series IDs: Louisville (LOIUR) and US (UNRATE).

a 12-month period, or almost three-quarters of the increase experienced over the past 10 years. These gains have helped to reduce the unemployment rate over the past year to a level consistent with the national rate.

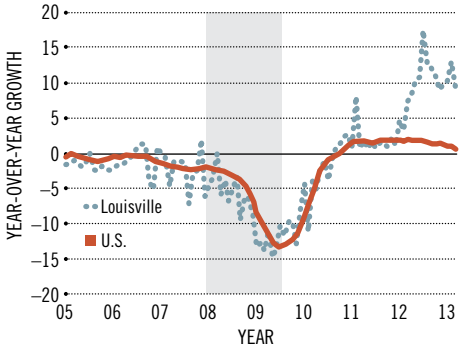
The apparent stall in the decline of unemployment in recent months, even as employment growth is strong, is likely attributable to growth in Louisville's labor force. This is a good reflection of better labor conditions, as more area workers who have been out of the labor force re-enter and seek employment. Since March 2012, Louisville has added almost 19,000 jobs to nonfarm payrolls, with almost 15,000 people entering the labor force. During that time, the unemployment rate fell from 8.5 percent to 7.8 percent.

Manufacturing employment, representing about 12 percent of total nonfarm employment in Louisville, has been a particularly strong growth driver. Generally on trend with the U.S. as a whole since 2005,

The Federal Reserve Bank of St. Louis is looking for local business leaders in the Eighth District to join the Bank's panel of contacts. Leaders are surveyed between four and eight times per year to gather information about the economy in their area; this information is distilled and passed on to our president and others who participate on the Federal Open Market Committee, our nation's chief monetary policymaking body. All information is compiled in a manner to preserve anonymity. To see a sample survey, go to https://research.stlouisfed.org/beigebooksurvey.

FIGURE 4

Manufacturing Employment



NOTE: Data are from the U.S. Bureau of Labor Statistics and are easily accessible in the St. Louis Fed's economic database, FRED, using these series IDs: Louisville (LOIMFG) and US (MANEMP).

Louisville's manufacturing employment began largely outpacing U.S. growth over the past year. Manufacturing employment increased by about 9 percent (6,300 jobs), contributing one-third of the new jobs in Louisville over the past year. These increases in growth are attributable to increased production from auto manufacturers, such as Ford and Toyota. Ford's truck plant is the fourth-largest local employer, with 8,696 employees. GE Appliances has also picked up employment lately as it added a product line; it now has 5,000 local employees.

This strong growth from manufacturing employment and the consistency from Louisville's traditionally strong sectors like health care have contributed to an overall positive current outlook for Louisville's economy.

What's around the Bend?

Recently, U.S. cities have come under criticism for their decaying and dilapidated infrastructure, specifically in bridge maintenance. This problem is particularly bad in older industrial cities, where tax revenue has been hurt by suburbanization and dwindling urban economies. Bucking the trend, Kentucky and Indiana have started on the Ohio River Bridges Project, which involves repairing a number of bridges and building two new ones over the Ohio River. One of the new bridges will connect downtown Louisville with sister city Clarksville, Ind. The second bridge will complete an interstate loop outside of the city center; this is a smaller undertaking.

Since 2003, politicians in both states have pushed for a cost-effective solution to the region's transportation and safety problems. The Ohio River Bridges Project commenced in June 2013 with the construction of a six-lane cable-stayed downtown bridge and the overhaul of the existing Kennedy Bridge. With an estimated cost of $2.6 billion, this undertaking represents about 1 percent of the metro area's annual output, as measured by gross metropolitan product.[1] It appears the project will benefit the local economy through construction and skilled labor, as well as improved transportation.

LOUISVILLE-SOUTHERN INDIANA OHIO RIVER BRIDGES PROJECT

An artist's rendering of the downtown bridge.

> *"The Ohio River Bridges Project will have a positive impact on construction employment growth and will generate significant economic benefits over the next three-plus years."*
>
> **–Louisville area commercial real estate contact**[2]

Assuming no major shifts, Louisville can expect its stable-growth sectors of health care and logistics to provide consistency in employment trends moving forward. Coupled with recent vigor in heavy manufacturing, such as for autos, and the large undertaking of the Ohio River Bridges Project, area employment conditions should continue to improve to postrecession bests. Should these trends continue, Louisville will continue to experience solid economic activity in this postrecession time. Ω

Charles S. Gascon is a regional economist, and Sean P. Grover is a research associate, both at the Federal Reserve Bank of St. Louis.

ENDNOTES

1. This estimate is based off the most recent data on gross metropolitan product for Louisville, assuming the project takes about four years to complete.
2. In order to assess the regional economy, the Federal Reserve Bank of St. Louis collects anecdotal information from a panel of business contacts multiple times a year. This is an excerpt from results of the survey taken between May 1 and May 15, 2013. For more information, see https://research.stlouisfed.org/regecon/.

Urban Areas Host the Largest Manufacturing and Service Employers

By Rubén Hernández-Murillo and Elise Marifian

The Eighth Federal Reserve District is composed of four zones, each of which is centered around one of the four main cities: Little Rock, Louisville, Memphis and St. Louis.

Over the past few decades, manufacturing employment as a share of total employment has declined across the U.S., with most of the manufacturing jobs lost in metropolitan areas. At the same time, cities have become increasingly more service-oriented.[1] Despite this general trend, metropolitan areas—and, in particular, large metropolitan areas—still contain the great majority of manufacturing jobs.

Similar to those across the U.S., urban areas in the Eighth District host the largest employers in manufacturing; urban areas also host the largest service employers. While service industries naturally thrive near large concentrations of people, manufacturing industries also gain from locating in urban areas, where they are near suppliers and firms in similar or related industries, including firms in related financial, legal and educational services. Cities also provide manufacturing firms potential workers of varying skill levels. Understanding the existing location patterns of both manufacturing and service industries is important because firms' location choices are in response to not only geographic advantages but also to public policies aimed at promoting employment growth or at developing targeted industries in certain areas.[2]

This article describes the geographic distribution of the largest (by employment) manufacturing and service industries in the 339 counties in the Eighth District. The best data for analyzing the distribution of industries and establishments across counties come from the County Business Patterns (CBP) statistics of the U.S. Census Bureau. The data are the latest available—as of March 2011.[3]

The analysis reveals interesting patterns. First, we found that in the Eighth District, both the largest manufacturing and the largest service industries were related to the food industry. Other important manufacturing industries were related to the auto industry, while other important service industries were related to the health-care industry. We also found that manufacturing employment was concentrated in a small number of industries, whereas service employment was spread across a larger number of industries. In addition, the average manufacturing establishment employed about three times as many people as did the average service establishment. Finally, except for a handful of counties in smaller urban areas—such as Tupelo, Miss.; Jasper, Ind.; and Paducah, Ky.—the largest concentrations of manufacturing and service employment and establishments occurred in or around the largest metro areas of the District.

The Largest Manufacturing and Service Industries

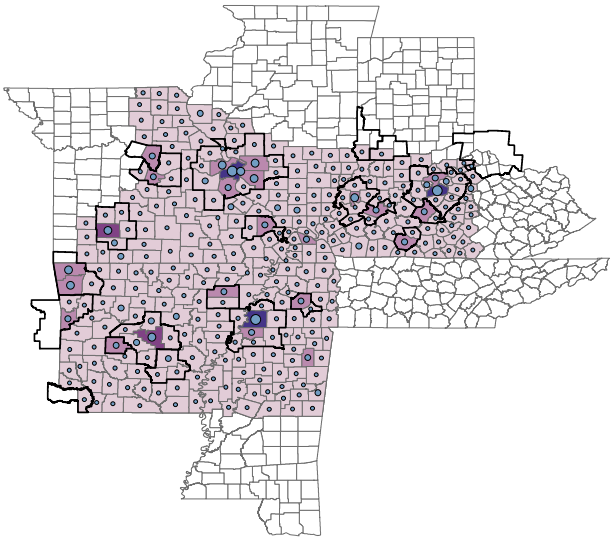
The largest three-digit manufacturing industry in terms of employment was food manufacturing (NAICS 311), with 109,212 employees and 1,065 establishments.[4] Other top three-digit manufacturing industries included transportation equipment (NAICS 336), with 84,152 employees and 646 establishments; fabricated metal products (NAICS 332), with 73,381 employees and 2,434 establishments; machinery manufacturing (NAICS 333), with 64,065 employees and 1,117 establishments; and plastics and rubber products (NAICS 326), with 61,424 employees and 716 establishments.

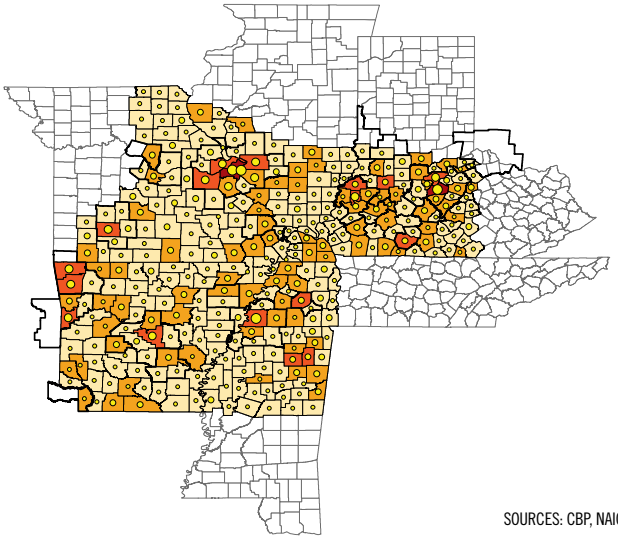
Among the service industries, the largest three-digit industry in terms of employment was also food-related: Food services and drinking places (NAICS 722) employed 454,361 people in 24,248 establishments across the District.[5] Other top service industries included: hospitals (NAICS 622), with 302,804 employees and 454 establishments; administrative and support services (NAICS 561), with 294,588 employees and 13,533 establishments; ambulatory health care (NAICS 621), with 260,645 employees and 24,736 establishments; and professional, scientific and technical services (NAICS 541), with 223,153 employees and 27,291 establishments.

Across the Eighth District, manufacturing employment was less diversified when compared with service employment. The 10 largest three-digit manufacturing industries in the District employed almost 80 percent of the total District manufacturing employment and made up about 74 percent of all manufacturing establishments in the District. In contrast, the top 10 largest three-digit service industries in the District employed only about 56 percent of total District service employment and represented only about 46 percent of all service establishments in the District. Manufacturing industries also employed more people per establishment on average, compared with services. Considering only the top 10 manufacturing industries, District counties were home, on average, to 1,687 manufacturing jobs in 31 establishments, or about 55 people per establishment. In contrast, District counties, on average, were host to 6,828 people in about 374 establishments in the largest service industries, or about 18 people per establishment.

The Geographic Distribution of Employment

The maps present the distribution of employment and establishments across District counties for the 10 largest three-digit manufacturing and service industries in





SOURCES: CBP, NAICS and geographic data from the U.S. Census Bureau.

terms of employment. Perhaps not surprising, the highest concentrations of manufacturing and service employment occurred in or around large urban areas in the District, mostly in metropolitan areas but also in some micropolitan areas.[6]

The highest per-county levels of manufacturing employment, in excess of about 5,000 people, occurred in counties near Fayetteville, Fort Smith and Little Rock, Ark.; St. Louis and Springfield, Mo.; Tupelo, Miss.; Memphis and Jackson, Tenn.; Evansville and Jasper, Ind.; and Louisville and Bowling Green, Ky. These areas also contained the largest number of establishments, usually exceeding the District average of 31 establishments per county. Only St. Louis County, Mo., and Jefferson County, Ky., employed more than 20,000 people in the top 10 manufacturing industries.

The largest concentrations of service employment, exceeding 50,000 people, occurred near Fayetteville, Little Rock, Memphis, St. Louis, Springfield and Louisville. Similar to the manufacturing scenario, counties in these areas also contained the largest number of service establishments, often exceeding 2,500 establishments. In the District, only five counties employed more than 100,000 people in the top 10 service industries: St. Louis City and St. Louis County, Mo.; Pulaski County, Ark.; Jefferson County, Ky.; and Shelby County, Tenn. Among the largest nonmetropolitan service-employing counties were Adams County, Williamson County and Jackson County in Illinois; St. Francois County in Missouri; Lee County in Mississippi; and McCracken County in Kentucky, with all exceeding 10,000 employees in the top 10 service industries. Ω

Rubén Hernández-Murillo is an economist and Elise Marifian is a research associate, both at the Federal Reserve Bank of St. Louis. For more on Hernández-Murillo's work, see http://research.stlouisfed.org/econ/hernandez/.

ENDNOTES

1 See Friedhoff et al.

2 See Helper et al.

3 Although establishment data are always provided, county-level industry employment data are often suppressed to prevent identity disclosure. In the case of data suppression, employment data were imputed using establishment counts by size class. For additional information on the use of the County Business Patterns data set and a previous analysis using these data, see Hernández-Murillo and Marifian.

4 According to the North American Industry Classification System (NAICS), industries are classified with increasing degree of detail using classifications with two to six digits. For example, manufacturing (NAICS 31) is the broadest category, and following with finer level of detail, we have food manufacturing (NAICS 311), bakeries and tortilla manufacturing (NAICS 3118), bread and bakery product manufacturing (NAICS 31181), and finally, frozen cakes, pies and other pastries manufacturing (NAICS 311813). The 2011 County Business Patterns use 2007 NAICS codes. (See www.census.gov/econ/cbp/download/index.htm.) Additional information on NAICS codes can be found at www.census.gov/cgi-bin/sssd/naics/naicsrch?chart=2007.

5 We define the service sector as the sum of industries with NAICS codes greater than or equal to 420 and less than 920.

6 A metro area contains a core urban area of 50,000 or more people, while a micro area contains an urban core of at least 10,000 but fewer than 50,000 people. For more information, see www.census.gov/econ/cbp/index.html, footnote 4.

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ASK AN ECONOMIST

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Q: What is potential output, and how is it measured?

A. When discussing the performance of the U.S. economy, people sometimes cite the output gap, which is the difference between actual and potential output. But what is potential output? A common misperception is that it is the maximum output the economy could produce if everyone were employed and all capital were used. Economists define potential output as what can be produced if the economy were operating at maximum sustainable employment, where unemployment is at its natural rate.[1] Therefore, actual output can be either above or below potential output.

Unlike actual GDP, we cannot observe potential GDP and must estimate it. As a result, different economists can have different views of potential output. One way to construct potential GDP is by fitting a trend line through actual GDP. Looking at a short sample period, however, may lead to an inaccurate estimate of potential. For instance, starting in 2000 would lead to a trend line that is defined by the expansion period and is relatively steep. If, on the other hand, output rose above potential during the expansion period, then the trend line would be slightly flatter. The latter case implies that output would have been above potential during the boom period and perhaps not quite so far below potential during the recession.

Many people believe that the previous decade had a housing bubble, with construction much higher than in normal times. If that is correct, the notion that the economy was producing output above potential prior to the recession does not seem that far-fetched. In that case, actual output today may not be as far below potential as a lot of people think.

ENDNOTE

[1] See Okun, Arthur M. "Potential GNP: Its Measurement and Significance," Cowles Foundation Paper 190, reprinted from the 1962 Proceedings of the Business and Economic Statistics Section of the American Statistical Association. See http://cowles.econ.yale.edu/P/cp/p01b/p0190.pdf.

LETTER TO THE EDITOR

We received comments from several readers regarding a statement appearing in "Banks and Credit Unions: Competition Not Going Away" (April 2013 issue of The Regional Economist*). The article states that credit unions and Subchapter S corporations are "similarly exempt" from federal income taxes. We asked Julie L. Stackhouse, senior vice president of the St. Louis Fed's Banking Supervision and Regulation division, to clarify the tax treatment of Subchapter S corporations. Her comments are below:*

A Subchapter S corporation is a corporation that has between one and 100 shareholders and that passes through net income or losses to shareholders in accordance with Internal Revenue Code, Chapter 1, Subchapter S. Subchapter S election is subject to criteria beyond restrictions on number of shareholders, including limitations on the class of permissible stock (only one class is allowed) and on who may be an eligible shareholder. There is no guarantee of dividends from the Subchapter S corporation to its shareholders for purposes of paying tax liability.

Because of these limitations, most commercial banks are organized as typical C corporations. Earnings of a C corporation are first taxed at the corporate level and then again at the shareholder level when dividends are paid on those earnings.

Credit unions, in contrast, do not pay taxes at the corporate level, nor do they have an outstanding tax liability that is passed through to their members.

In summary, Subchapter S corporations avoid the double taxation experienced by C corporations and their shareholders. However, these advantages do not amount to an exemption from federal taxation.

THE ST. LOUIS FED FINANCIAL STRESS INDEX

The St. Louis Fed Financial Stress Index (STLFSI) measures the degree of financial stress in U.S. markets; values below zero suggest below-average financial market stress, and values above indicate the opposite. To see the latest weekly reading, as well as to find out how the index is constructed, see www.stlouisfed.org/newsroom/financial-stress-index/.

We welcome letters to the editor, as well as questions for "Ask an Economist." You can submit them online at www.stlouisfed.org/re/letter or mail them to Subhayu Bandyopadhyay, editor, *The Regional Economist,* Federal Reserve Bank of St. Louis, P.O. Box 442, St. Louis, MO 63166-0442. To read other letters to the editor, see www.stlouisfed.org/publications/re/letters/index.cfm.

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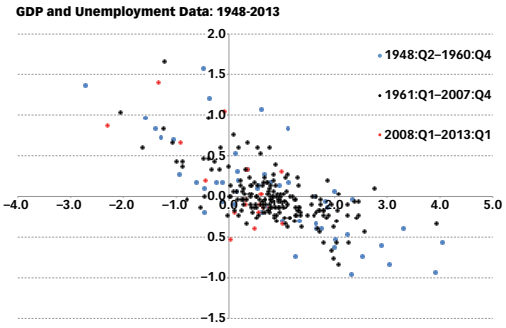
NEXT ISSUE

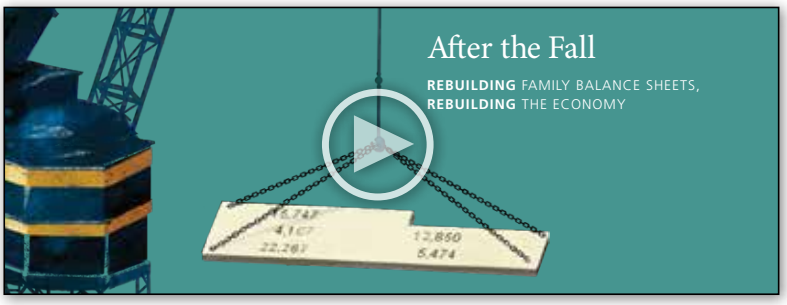
Does Okun's Law Still Hold?



Motivated by the desire to determine the potential productive capacity of the economy, Arthur Okun empirically examined the relationship between the unemployment rate and the output growth. The relationship that he identified—that a one-percentage-point decrease in the real GNP growth rate was associated with a 0.3-percentage-point increase in the unemployment rate—has since been identified as Okun's Law.

Since this discovery in the 1960s, many policymakers, media and macroeconomic textbooks have cited this figure as a rule-of-thumb way of transforming changes in output growth to changes in labor market outcomes and vice versa.

The lead article in October's issue of *The Regional Economist* will look into modern empirical work assessing Okun's Law and whether that unemployment and output relationship holds at a regional level.



Learn about the Importance of Strong Household Balance Sheets in Just Eight Minutes

This short video summarizes the key points made in the essay from the new annual report of the Federal Reserve Bank of St. Louis. The video explains the importance of strong household balance sheets not only for individual families but for the overall economy. The goals of the Fed's new Center for Household Financial Stability are also explained. To watch the video, go to www.stlouisfed.org/ar.

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