

# THE REGIONAL ECONOMIST

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Economic Conditions*

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THE FEDERAL RESERVE BANK OF ST. LOUIS  
CENTRAL TO AMERICA'S ECONOMY®

Russia  
Declining Population  
May Hurt GDP Growth

Liquidity  
Was There Really a Flood?  
Where Did the Money Go?



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**Some Labor Trends Pre-Date the Recession**

*By Marianna Kudlyak and Juan M. Sánchez*

Although the unemployment rate is strong these days, other labor-related statistics are being called weak for this stage of an economic recovery. The downward trend in labor force participation, wage growth, job reallocation and other stats started a long time ago, however.



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**Focus on Low Real Interest Rate Might Be Misplaced**

*By Jonas Crews, Kevin L. Kliesen and Christopher J. Waller*

When investors complain about low interest rates, they are usually referring to the rates on government bonds, particularly TIPS (Treasury Inflation Protected Securities). But such rates should not be seen as proxies for the rates of return on all investments. Real returns to productive U.S. fixed investment in tangible capital have not fallen over the past 25 years.

## What Does Data Dependence Mean?

The Federal Open Market Committee (FOMC) has emphasized that decisions regarding the normalization of monetary policy will be data-dependent. Data dependence is sometimes misinterpreted as meaning decisions are based on the data released just before an FOMC meeting. That interpretation is far too narrow and inconsistent with good monetary policymaking. Rather, the decisions should be based not only on the current dynamics in the data but also on longer-run trends and expectations for data going forward.

Data are often revised, sometimes significantly. For example, payroll employment increased in August 2014 by an initial estimate of 142,000 compared with the current estimate of 213,000.<sup>1</sup> Knowing that revisions are possible, monetary policymakers must strike a balance between not wanting to react too much to day-to-day observations on the economy versus wanting to react sufficiently to changes in underlying macroeconomic conditions. Every observation on the economy (e.g., a GDP report or an employment report) contains a certain amount of signal and a certain amount of noise. The art of policymaking includes separating the signal from the noise.

Weather is a factor that at times can increase the size of noise relative to the signal for economic data. In such cases, monetary policymakers might want to temper their reaction to specific data. Consider the case of real gross domestic product early last year, when weather was thought to have disrupted economic activity. According to the most recent estimate, real GDP in the first quarter of 2015 grew at an annualized rate of 0.6 percent—higher than the initial and follow-on estimates of 0.2 percent, -0.7 percent and -0.2 percent. The FOMC did not make any appreciable adjustments to policy in response to those GDP reports. As this example illustrates, data dependence

does not mean necessarily that a particular number or even a sequence of numbers is going to change the course of policy.

Monetary policy decisions must be made with an eye toward the future. It is well-known that monetary policy operates with long and variable lags. Accordingly, the monetary policymaker must incorporate forecasted future outcomes when making current monetary policy decisions. Although macroeconomic forecasts are changed in response to new data, the changes tend to depend on whether a particular piece of data was expected and how important it is relative to other pieces of data. Given that the contours of forecasts do not change very quickly, monetary policy strategy also does not change very quickly. However, both probably would change in response to an ongoing slew of worse-than-expected or better-than-expected data.

The FOMC effectively deviated from data-dependent decision-making when it introduced calendar-based forward guidance in August 2011. The committee gave a specific calendar date for how long the zero interest rate policy, which had been in place since December 2008, was expected to continue (“at least through mid-2013”).<sup>2</sup> At subsequent meetings, the committee extended the date. Throughout that period, I argued that the guidance should be dependent on the state of the economy rather than on a calendar date. The FOMC moved to data-dependent forward guidance in December 2012, when it replaced the calendar date with the so-called thresholds for inflation (2.5 percent) and unemployment (6.5 percent).<sup>3</sup> In March 2014, the FOMC discarded the thresholds because unemployment approached 6.5 percent. However, language about being data-dependent remained in the statement.

During the 2004-2006 normalization cycle, the FOMC raised the policy rate by



0.25 percentage points per meeting for 17 consecutive meetings. Arguably, monetary policy during that era was insufficiently attentive to incoming macroeconomic data. Possibly, the recent emphasis on data dependence will usher in a period of monetary policymaking more akin to the 1980s, 1990s and the early 2000s, when the policy rate was adjusted in response to current macroeconomic data, longer-run trends and forecasts, but not in a fashion that was overly reactive to only the latest data or noisy aspects of macroeconomic developments. 

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

### ENDNOTES

- 1 Numbers were obtained from ALFRED, the St. Louis Fed's archival economic database. See also Kevin Kliesen, "August Nonfarm Payroll Numbers Lower than Forecasted? Wait for the Revisions." *St. Louis Fed On the Economy* blog post on Sept. 4, 2015, at [www.stlouisfed.org/on-the-economy/2015/september/august-nonfarm-payroll-numbers-down-revisions](http://www.stlouisfed.org/on-the-economy/2015/september/august-nonfarm-payroll-numbers-down-revisions).
- 2 See the FOMC statement on Aug. 9, 2011, at [www.federalreserve.gov/newsevents/press/monetary/20110809a.htm](http://www.federalreserve.gov/newsevents/press/monetary/20110809a.htm).
- 3 That is, the zero interest rate policy was expected to continue at least as long as unemployment was above its threshold and inflation was at or below its threshold. For a discussion of some issues related to thresholds, see my presentation on Jan. 10, 2013, "The Fed's New Regime and the 2013 Outlook," at [www.stlouisfed.org/~media/Files/PDFs/Bullard/remarks/BullardWisconsinForecastLuncheon10Jan2013final.pdf](http://www.stlouisfed.org/~media/Files/PDFs/Bullard/remarks/BullardWisconsinForecastLuncheon10Jan2013final.pdf).



# Labor Indicators

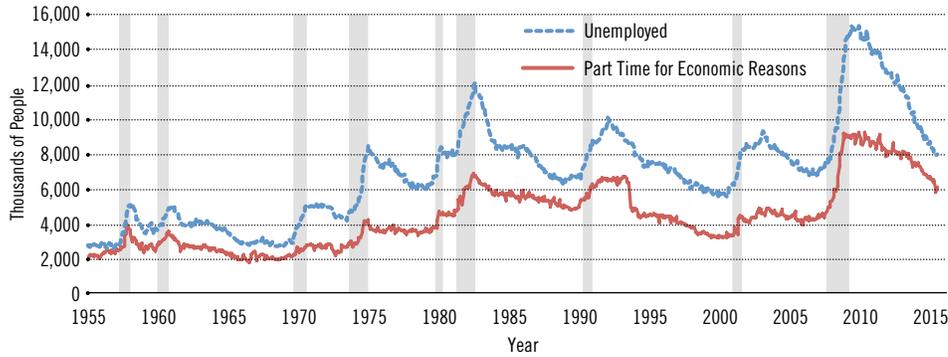
## Some of Today's Trends Pre-Date the Great Recession

*By Marianna Kudlyak and Juan M. Sánchez*

More than six years after the Great Recession reached its trough, policymakers and researchers are still debating whether a full-blown, robust recovery in the labor market is under way. Although the unemployment rate declined from 10 percent in October 2009 to 5 percent in October 2015, some policymakers and researchers are concerned that other labor statistics are lagging the levels typically expected in the mature stages of an economic expansion. For example, several point to the number of workers who report working part time but would like to work full time. This number has been declining more slowly than the level of unemployment. (See Figure 1.)

FIGURE 1

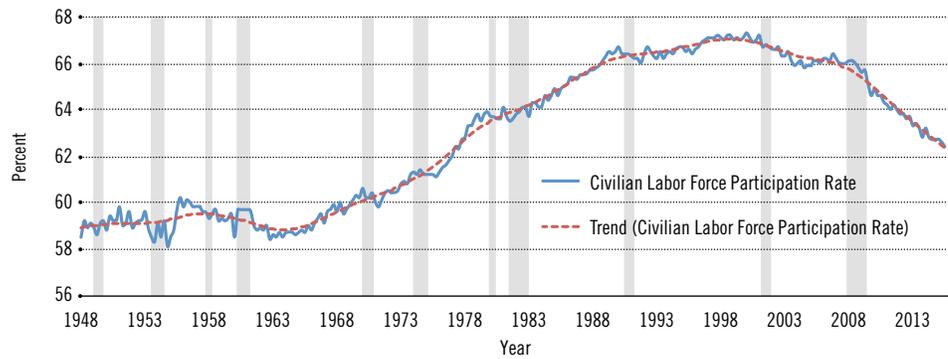
**Unemployed and Employed Part Time for Economic Reasons**



SOURCE: Current Population Survey of the U.S. Census Bureau and the U.S. Bureau of Labor Statistics (BLS). Data can be found in the Federal Reserve Economic Database (FRED).  
NOTE: Gray bars indicate recessions.

FIGURE 2

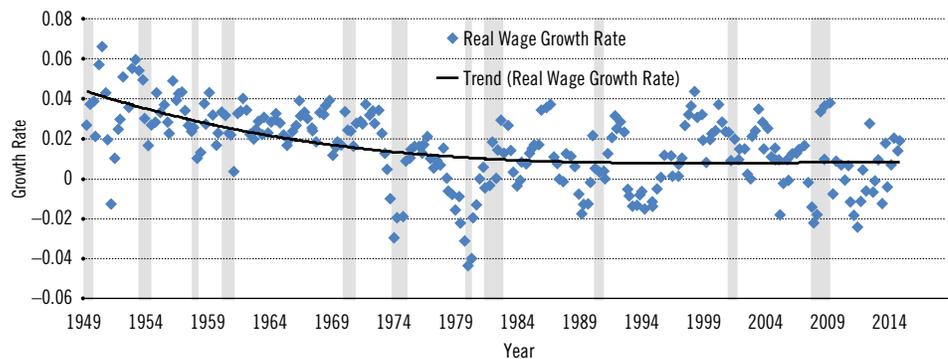
**Labor Force Participation Rate**



SOURCE: Current Population Survey and FRED.  
NOTE: Data are quarterly and seasonally adjusted. The trend line is obtained using the Hodrick-Prescott (HP) filter. Gray bars indicate recessions.

FIGURE 3

**Year-over-Year Real Wage Growth Rate**



SOURCE: Wage is “total economy compensation per hour” from the U.S. Bureau of Labor Statistics; it is deflated using consumer price index (CPI) data obtained from FRED.  
NOTE: The numbers are quarterly and seasonally adjusted. The trend line is a third-order polynomial. Gray bars indicate recessions.

We argue that some cyclical factors are being confused in this debate with secular, or long-term, trends in the labor markets—trends that started many years before the latest recession. We cite evidence to support the idea that the current apparent weakness in the labor market may be related to the long-term negative trends in labor force participation, real wage growth, job reallocation and business creation. In this context, many labor indicators are actually stronger today than they have been in years, and even many of the “weak” ones have rebounded from Great Recession levels.

**Long-run Trends in Quantities and Prices**

The potential concerns about the labor market pertain to quantities and prices. On the quantities side, the labor force participation rate (i.e., the share of the population that is employed or actively looking for a job) has continued its plunge, which started in 2000 and accelerated after 2007, as seen in Figure 2. While part of this decline can be attributed to an aging population,<sup>1</sup> there is a concern that the individuals who are currently out of the labor force might join the labor force later, thereby slowing down the improvement in the unemployment rate.

On the price side in the labor market, real wage growth has remained relatively flat since the recession trough, as seen in Figure 3. For instance, average yearly growth from 1995 to 2005 was 1.77 percent, while it was only 0.14 percent from 2010 to 2015. The evolution of the curved line shows that the recent dynamics of real wage growth may be also affected by a trend that started in the 1980s.

How does one square these developments with the rapidly declining unemployment rate, the low number of unemployed per vacancy (a number that is back to prerecession levels) and anecdotal evidence that firms are having a hard time finding workers to fill open positions? Is the labor market recovery still in its fragile stage? Or is this how the mature stage looks?

Undoubtedly, the 2007-09 recession represented a large shock to the economy. Given the magnitude of the shock, the recession might have caused some changes in

the economy that can be dubbed as “structural”; these cannot be easily changed back with monetary policy tools. It is important, however, to consider the post-Great Recession developments in the labor market in the context of secular trends that originated long before the 2007-09 recession. In the rest of this article, we argue that the findings mentioned above are indeed connected and, in fact, are part of a less-known group of secular trends in the U.S. labor market that started before the Great Recession. Together, our findings indicate that there may be a new normal in the U.S. labor market.

### A Decline in Business Dynamism

The evidence on longer-run trends in the U.S. labor market also includes research on what economists Steven Davis and John Haltiwanger have referred to as the “decline in business dynamism.” These two documented the decline in several measures of job reallocation (i.e., job creation plus job destruction).<sup>2</sup> Figure 4 shows the decline of job reallocation from 15.5 percent in the early 1990s to about 12 percent in 2014. In addition, evidence shows similar trends in other measures of business dynamism, such as worker reallocation, worker churn, worker turnover and an increase in job tenure.<sup>3</sup>

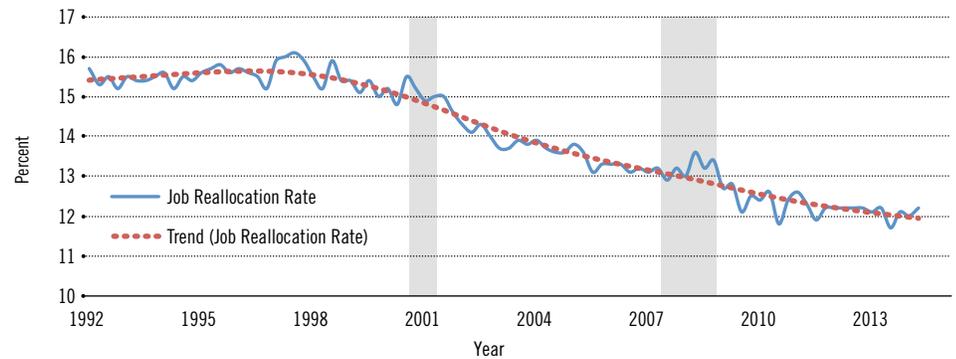
These trends are related to recent evidence that points toward the “collapse” of the job ladder. The job ladder is a theory that is useful to understanding employment dynamics over the business cycle. In particular, it explains how during advanced stages of the recovery, large employers poach workers from smaller employers. The decline in labor turnover after the recession affected this transition of workers from smaller to larger employers, which, in turn, slowed down hiring from the nonemployment sector.<sup>4</sup>

Another important trend in the labor market is job polarization, whereby occupations in the middle of the skill distribution (routine cognitive and routine manual) are disappearing, while occupations at the lower and higher ends of the distribution are growing.<sup>5</sup>

One way to understand the dynamics of the labor market is to examine the behavior of firms and what’s going on in regard to the creation of new firms. Economists Benjamin Pugsley and Aysegul Sahin, among others,

FIGURE 4

### Job Reallocation Rate



SOURCE: The BLS's Business Employment Dynamics. See [http://www.bls.gov/web/cewbd/table3\\_1.txt](http://www.bls.gov/web/cewbd/table3_1.txt).

NOTE: Data pertain to jobs in the private sector; data are quarterly and seasonally adjusted. The job reallocation rate is calculated as the sum of gross job gains rate and gross job losses rate. Basically, it is the sum of how many jobs were created and how many jobs were destroyed in a period, over the total number of jobs. The trend line is obtained using the HP filter. Gray bars indicate recessions.

“The findings ... are indeed connected and, in fact, are part of a less-known group of secular trends in the U.S. labor market that started before the Great Recession. Together, our findings indicate that there may be a new normal in the U.S. labor market.”

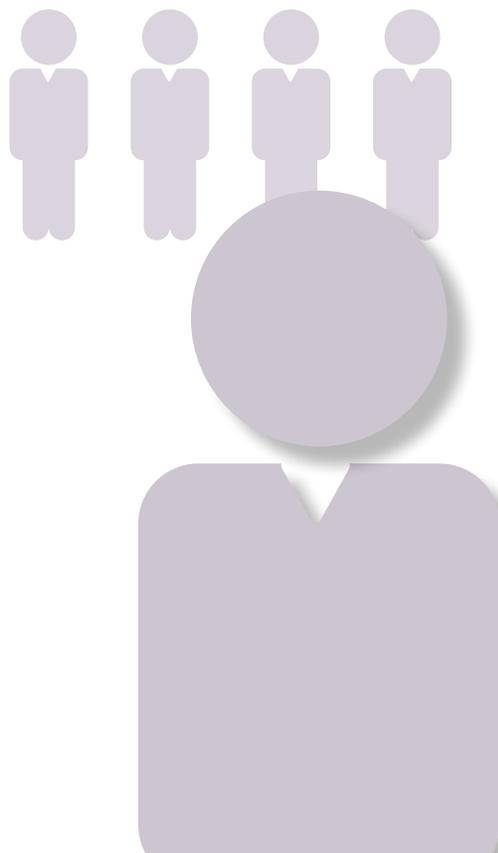
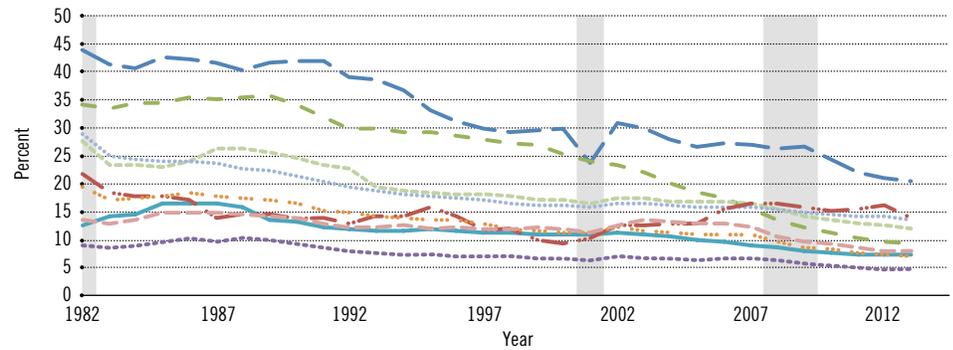


FIGURE 5

**Young Firms' Share of Employment by Sector**



SOURCE: BLS's Business Dynamics Statistics (BDS). See [www.census.gov/ces/dataproducts/bds/data\\_firm.html](http://www.census.gov/ces/dataproducts/bds/data_firm.html).

NOTE: Sector definitions can be found on the BDS website. Employment share is calculated as the ratio of employment of young firms (age five or younger) for each sector to total sector employment. Data are annual. Gray bars indicate recessions.

- Agriculture
- Manufacturing
- Retail Trade
- Mining
- Transportation and Public Utilities
- Fire, Insurance and Real Estate
- Construction
- Wholesale Trade
- Services

“All of these facts indicate that the U.S. labor market is less dynamic than it once was. While these trends originated at the beginning of the 1980s, they accelerated after 2000, according to the literature. The acceleration in the past 10 years might have been masked by the 2005-2007 expansion.”

convincingly documented in 2015 two trends in the demographics of U.S. firms. First, they reported a dramatic decline in the creation of firms, a decline often referred to as the “startup deficit.” Second, and very related, they documented a gradual shift of employment toward older firms.

The startup deficit is widespread across industries, most agree. Figure 5 shows that this shift affects most of the sectors in the economy and started in the early 1990s. The decline in the startup rate is even more dramatic if one takes into consideration that the industry composition of employment has been shifting toward retail and services, industries that typically have a relatively high share of young firms.

Pugsley and Sahin suggested that the startup deficit has contributed to changing how employment fluctuates over the business cycle. In particular, during contractions, there are two opposite effects: While the decline in startups amplifies the decline of employment, the larger share of employment in more-mature firms dampens the contraction of employment. (Large firms are less likely than small firms to fire people.) In contrast, during recoveries, both effects act in the same direction: Both the decline in firm entry and the larger share of employment in more-mature firms dampen employment growth. (Large firms are less likely than small firms to hire people.) The result is the emergence of jobless recoveries.

**Acceleration of Negative Trends**

All of these facts indicate that the U.S. labor market is less dynamic than it once was. While these trends originated at the beginning of the 1980s, they accelerated after 2000, according to the literature. The acceleration in the past 10 years might have been masked by the 2005-2007 expansion. This acceleration coincided with what was happening with aggregate labor force participation, which peaked in 2000 and then started to decline. In fact, male labor force participation has been declining for decades. Women’s labor force participation rose until 2000, after which it started to fall.

A closer look at the industry composition of startups and the timing of their decline reveals that the startups most closely associated with employment growth had been growing prior to 2000 but declining afterward. Startups can be broken down into “subsistence” and “transformational” entrepreneurs.<sup>6</sup> The former group is associated with mostly creating employment for the entrepreneurs themselves and their family members, while those in the latter group are known for being the “engines of employment growth.”

While, ex ante, it might be challenging to distinguish which startups will eventually grow, economist Ryan Decker and his co-authors attempted to do just that in 2014 when they looked at startups by industry. The positive news for productivity is found

in the retail sector, in which there has been a shift since the 1980s, when there were many startups, many of which were small “Mom and Pop” stores, to today’s fewer startups, many of which are branches of large, stable national chains in retail trade.<sup>7</sup> The negative news for future productivity is that high-tech startups, which are a critical sector for innovation and productivity growth, were rising before 2000 and have been sharply declining since.

In general, more research is needed to understand whether the results on the startup deficit reflect changes in the dynamics of employment growth relative to other possible explanations. Further investigation is also needed into how much of the startup deficit is an efficient response to technological shifts (e.g., newer information and communication technologies giving an advantage to large incumbent firms relative to entrants) versus the result of distortions that are affecting the efficient allocation of workers to firms (e.g., regulations that are affecting workers’ mobility across states and jobs, and regulations that are increasing the costs of starting a business). Although the literature has not yet achieved a consensus on what the drivers of the decline in business dynamism are, among the possible explanations are the lower growth in the supply of labor<sup>8</sup> and less willingness to take on the risks inherent in a highly entrepreneurial economy.<sup>9</sup>

## Conclusions

Although there is no clear answer yet on how to connect all these facts, viewing the postrecession developments in the context of the long-term trends seems relevant. In particular, distinguishing cyclical phenomena from long-term trends might be helpful to guide policy.

Questions for future research are plentiful. For example, what is behind the decline in the labor force participation rate? How much of the decline in that rate is due to the disappearance of middle-skill occupations and the resulting cut in wages, both of which have led some people to think they are better off not working than working? How much of the decline represents increased schooling (possibly in response to growing job requirements)?

The U.S. labor market has always been characterized by a high degree of fluidity, which allows workers to switch jobs in searching for the best match. Typically, workers who switch jobs enjoy significant wage growth. Thus, if there are barriers to switching, the aggregate job growth might be hampered, simply because wage growth is reduced. However, one needs to understand the nature of such barriers. Are these barriers due to some inefficient regulatory changes, or are they a response to some technological advances that lead to higher specificity of job-specific human capital that discourages reallocation?

Declining business dynamism and other trends (like job polarization) matter because they might lower labor productivity and, in turn, wages and labor force participation. These negative trends might have interacted with cyclical effects during the economic recovery phase. Are these trends likely to be reversed with more expansionary monetary policy? To answer that, we need to understand the underlying forces behind the decline in business dynamism: Maybe it’s an optimal response to new technological shocks, or maybe the decline is due to some bad regulatory changes. [9](#)

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## ENDNOTES

- <sup>1</sup> See Kudlyak, and see Aaronson et al.
- <sup>2</sup> See Davis and Haltiwanger, and see Haltiwanger.
- <sup>3</sup> See Davis et al., Hyatt and McEntarfer, and Hyatt and Spletzer.
- <sup>4</sup> See Moscarini and Postel-Vinay.
- <sup>5</sup> See Autor et al.
- <sup>6</sup> See Schoar, and see Decker et al.
- <sup>7</sup> See Foster et al.
- <sup>8</sup> See Karahan et al.
- <sup>9</sup> See Haltiwanger.

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# Rising Productivity, Declining Population Impact Russia's Economy

By Guillaume Vandenbroucke



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The Berlin Wall collapsed in 1989, and the Soviet Union did so two years later. Since then, Russia's transition to a market-based economy and a Western-style democracy has been slow. Yet, in recent years, Russia has been playing an increasing role on the international scene. But where exactly does the Russian economy stand relative to that of the United States? And how has this standing evolved over time? In this article, I present a few aggregate statistics to help answer these questions.

## The Growth Rate of GDP per Capita

Let's start with the most basic aggregate indicator of the state of an economy: the real gross domestic product (GDP) per capita. This is a measure of the amount of final goods and services to which the average person has access in a given period of time. Panel A of Figure 1 shows GDP per capita over time in the Russian Federation, the U.S. and the whole world. The figures are normalized to 100 in 1989. Thus, Panel A indicates differences in the growth rate of GDP per capita in Russia, the U.S. and the world as a whole.

Notice three subperiods in particular. The first one, lasting from 1989 to 1998, shows a remarkable decline in Russia's GDP per capita. At the trough, in 1998, Russia's real GDP per capita was 56 percent of its 1989 value. In annual terms, this amounts to a 5.6 percent reduction in GDP per capita every year for 10 years. In comparison, when the U.S. GDP per capita declined during the Great Recession, which ran from the end of 2007 until mid-2009, it did so by just 4 percent. Over the entire 1989-1998 period, GDP per capita in the U.S. actually rose 17 percent. (World GDP per capita rose 10 percent over those 10 years.)

The second subperiod of note in Panel A runs from 1998 to about 2008. During this time, Russia's GDP per capita was on the rise. In 2007, it exceeded its 1989 level for the first time—GDP per capita was 7 percent above what it was in 1989. In contrast, U.S. GDP per capita in 2007 was 39 percent above its 1989 level.

Finally, since 2008, Russia has suffered the consequences of the Great Recession, and its GDP per capita has not exhibited much growth relative to the preceding years. It is too early to assess whether this pause is going to last a long or short time.

## The Level of GDP per Capita

Panel B of Figure 1 shows Russia's GDP per capita relative to that of the U.S. In 1989, Russia was already poor relative to the U.S. Russia's GDP per capita was about 18 percent of that of the U.S. The deep recession following the collapse of the Soviet Union (noted in Figure 1) made things even worse. At the trough in 1998, Russia's GDP per capita was less than 9 percent of that of the U.S.

After 1998, Russia started to grow faster than the U.S. Despite the progress made in closing the gap between 1998 and 2008, Russia still had not reached by 2008 its 1989 level relative to the United States. The federation remains a noticeably poorer economy, with a GDP per capita in the neighborhood of 15 percent of that of the U.S.

## The Role of Productivity

Economists Revold Entov and Oleg Lugo-voy have presented an interesting study of the behavior of Russia's GDP during this period. They used a technique called growth accounting, which decomposes the growth of GDP into the contribution of the growth of

the factors used to produce it: capital, labor and productivity. They showed that Russia's negative growth during the 1989-1998 period resulted from lower productivity, employment growth and capital utilization. Each of these components, they found, contributed equally to the negative growth rate.

For the next 10 years, however, the growth rate in Russia was stronger than that in the United States. Productivity growth was the main reason, accounting for 59 percent of the GDP growth. The contributions of capital and labor were smaller, 28 and 13 percent, respectively.

To understand the reason behind productivity growth in the 1998-2008 period is beyond the scope of this article. There exists a vast literature on the Russian transition and the effects of reforms undertaken since the fall of the Berlin Wall. A few works are listed in the references.

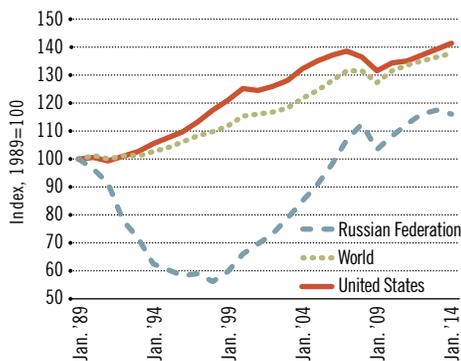
## The Population

To assess the performance of an economy via GDP per capita alone raises many well-known issues. In particular, an increase in GDP per capita does not necessarily imply an increase in the well-being of the population.<sup>1</sup> For this reason, economists sometimes rely on alternative measures of performance, such as measurements of people's heights and life expectancy. In the case of Russia, it is instructive to look at the evolution of its population in terms of life expectancy, birth rates and net migration.

This is not to say that a country's population is a direct measure of well-being. The assumption behind the analysis is rather that the two are positively correlated: When a population's well-being increases, life expectancy may increase as well (because of improvements in health, for example). In addition people

FIGURE 1

**Panel A – Constant GDP per Capita, 2005 U.S. Dollars**



SOURCES: World Bank and Federal Reserve Economic Data (FRED).

NOTE: In Panel A, the units are normalized to 100 in 1989 to help compare the evolution over time. Panel B shows the gross domestic product per capita of Russia, expressed in 2005 U.S. dollars, relative to that of the U.S., expressed in 2005 U.S. dollars, as well.

**Panel B – Russia's Constant GDP per Capita Relative to That of the U.S.**

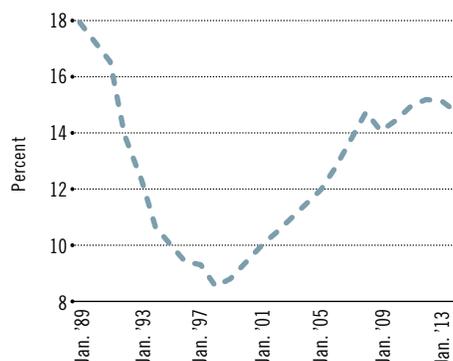
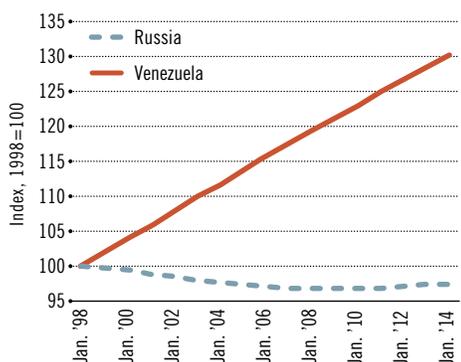


FIGURE 2

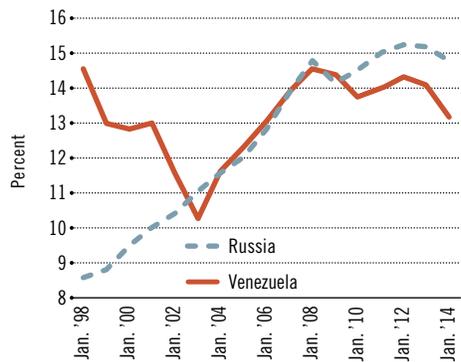
**Panel A – Population of Russia and Venezuela**



SOURCES: World Bank and FRED.

NOTE: In Panel B, the percentages were calculated using 2005 U.S. dollars for each country.

**Panel B – GDP per Capita of Russia and Venezuela Relative to That of the U.S.**



are more willing to enter the country and less willing to leave it. All these factors contribute to increasing the country's population.

Panel A of Figure 2 compares the evolution of Russia's population since 1998 with Venezuela's. The figures are normalized to 100 in 1998 to render the comparison possible. Why compare Russia with Venezuela? Because for many of these years, the two countries had levels of GDP per capita (relative to the United States) that were similar. This similarity can be seen in Panel B of Figure 2.<sup>2</sup>

The message to take away from Figure 2 is that Russia was adversely affected by factors other than GDP per capita that resulted in a 3 percent decline of its population between 1998 and 2014. During the same time, Venezuela's population grew by 30 percent.

Understanding the causes of this demographic slump raises interesting and

challenging questions. Answering them is, again, beyond the scope of this article.

### Conclusion

Russia has a long way to catch up to levels of GDP per capita in the U.S. Data suggest that this catching up is taking place, thanks to productivity growth, even though the catching up may have been put on a temporary hold after the Great Recession. But a deeper problem faces Russia: Why is its population shrinking? Will this phenomenon last, or will population rise again? 

*Guillaume Vandenbroucke is an economist at the Federal Reserve Bank of St. Louis. For more on his work, see <https://research.stlouisfed.org/econ/vandenbroucke>.*

### ENDNOTES

- Think, for example, of wars that are accompanied by increased government spending, which, mechanically, raises GDP per capita.
- There is a noticeable difference for the first four years, but this only reinforces the point being made here: The Venezuelan population grew during these four years, despite the bad performance of its GDP per capita.

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## Where Did All the New Liquidity Go?

By Fernando M. Martin



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In response to the Great Recession (2007:Q4-2009:Q2), the Federal Reserve and the federal government implemented policies that dramatically altered the liquidity structure of the economy. Three such policies stand out, as summarized in Figure 1.

First, successive rounds of quantitative easing, starting in late 2008, greatly expanded the monetary base as the Fed purchased large amounts of securities. The holdings of U.S. Treasury securities plus securities backed by agencies and government-sponsored enterprises (GSEs) went from 5 percent of gross domestic product (GDP) in 2007:Q4 (about the historical average) to 24 percent of GDP as of 2015:Q2.<sup>1</sup> Second, the payment of interest by the Fed on bank reserves, which also started in late 2008, combined with banks' own change in behavior, increased bank reserves from almost zero to 13 percent of GDP as of 2015:Q2. Third, the federal government attempted to stimulate the economy with a mix of increased spending and tax relief.<sup>2</sup> The resulting deficits implied a significant increase in government debt: The stock of Treasury securities went from about 41 percent of GDP in 2007:Q4 to 80 percent of GDP in 2015:Q2.<sup>3</sup> (Treasury securities expand available liquidity since they are widely accepted as collateral in credit and financial transactions, such as repos, and allow agents to economize on cash balances.)

On the surface, these policies have greatly expanded liquidity. A presumed benefit of such an expansion is easier access to credit, which could boost economic activity; a perceived cost is the risk of higher inflation. Whether these policies succeeded in stimulating the economy is debatable. Whatever

the merits of these policies, however, GDP is still below its prerecession trend, and growth has slowed down significantly. At the same time, some may find it puzzling that inflation has not yet skyrocketed and, instead, has been below the target of 2 percent annualized.

These outcomes may be explained, in part, by inconsistencies in how expansionary policy was implemented.<sup>4</sup> While the federal government has indeed issued significantly more debt, a nontrivial share was acquired by the Fed itself. Similarly, the Fed purchased large amounts of securities from banks, which, in turn, were given incentives to keep the proceeds in their balance sheets by virtue of being paid interest on reserves. It appears plausible, then, that a significant part of the recent liquidity expansion did not find its way to those economic actors that would find such liquidity useful, i.e., households and businesses. It should then not be surprising that inflation has not picked up and that inflation expectations remain depressed. Essentially, there was no excess supply of money competing for goods and services to drive up prices. In what follows, I will provide support to this argument by quantifying how the liquidity expansion was distributed among relevant economic groups.

The *creation* of liquidity is in the hands of a few actors, which are either in charge of conducting policy or directly affected by policy and financial regulation. These actors include the government (at all levels), the Fed, depository institutions, money market mutual funds and GSEs. On the other side are the *users* of this liquidity: households, nonfinancial businesses, other financial institutions (pension funds, mutual funds,

insurance companies, etc.) and the rest of the world. How have the liquidity holdings of the users been affected by policy?

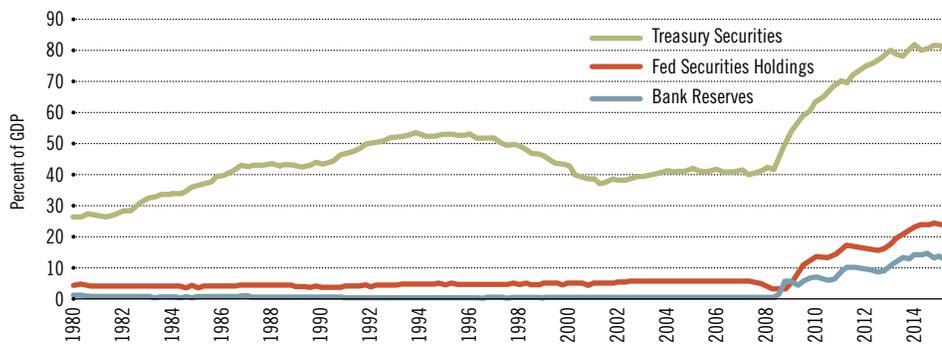
Figure 2 shows the evolution of liquid financial assets, in terms of GDP, by sector. All data are from the Financial Accounts of the United States (the "flow of funds"). The assets included are currency, checkable deposits, savings and time deposits, money market funds shares, Treasuries, and agency- and GSE-backed securities. Three sectors or groups are shown: the private nonfinancial sector (households and businesses), other financial institutions (i.e., the financial sector excluding the Fed, depository institutions, money market mutual funds and GSEs) and the rest of the world.<sup>5</sup> The consolidated total, which incorporates all excluded sectors (i.e., the *creators* of liquidity), is also shown for reference.<sup>6</sup>

The picture painted by Figure 2 is considerably less dramatic than one would have anticipated given the policy innovations described above and displayed in Figure 1. Liquid financial assets held by the domestic sectors (households, businesses and other financial institutions) show a small, but permanent increase: from 108 percent of GDP in 2007:Q4 to 113 percent in 2015:Q2. All of this increase is due to a rise in savings and time deposits owned by households, which had been steadily increasing since 2000. If we were not counting savings and time deposits, we would instead see a temporary bump in this sector's liquid assets holdings, around the time of the financial crisis and the subsequent recession, but no permanent increase.

When we include the rest of the world, the increase in liquidity during the recession is more prominent, going from 139 percent in 2007:Q4 to 160 percent in 2015:Q2.

FIGURE 1

Three Vehicles for Boosting Liquidity

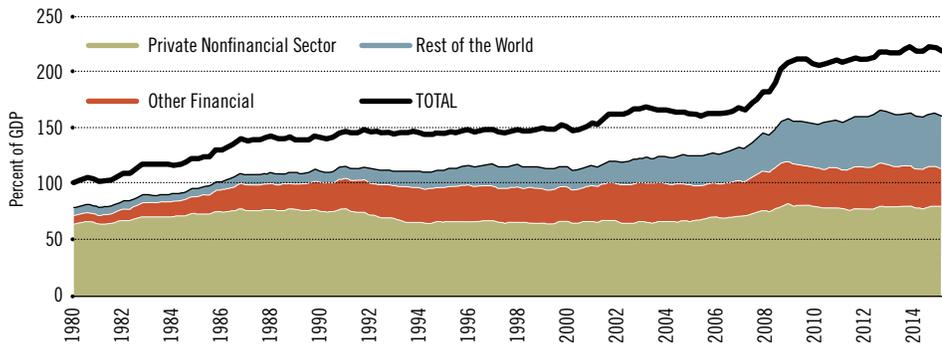


SOURCE: Haver Analytics.

NOTE: In an effort to stimulate the economy after the Great Recession (2007-09), the Fed and the federal government took three key steps to boost liquidity. The Fed dramatically increased its holdings of Treasury securities and securities backed by government agencies (such as the Tennessee Valley Authority) and government-sponsored enterprises (such as Fannie Mae). Bank reserves also jumped after 2008 because the Fed started paying interest on such. Finally, the federal government embarked on stimulus spending and tax relief, which caused a significant increase in outstanding Treasury securities.

FIGURE 2

Liquid Financial Assets



SOURCE: Haver Analytics.

NOTE: The figure shows the evolution of the holdings of liquid assets (as a percentage of GDP) by sector. Although fiscal and monetary policies were extremely accommodative after the Great Recession (2007-09), the liquid asset holdings of the users of liquidity did not rise dramatically. The only sector in which the increase was significant was “the rest of the world,” stemming from the acquisition of Treasury securities by foreigners in their “flight to quality.”

This follows from a significant expansion in the stock of Treasury securities held by foreigners. Note that these holdings have been steadily increasing since the 1980s but accelerated dramatically starting in mid-2007, most likely due to flight-to-quality considerations, i.e., a worldwide increase in the demand for safe financial assets. In other words, most of the liquidity expansion was acquired by a sector (the rest of the world) that was hungry for it—supply and demand moving together.

In sum, although fiscal and monetary policies have been unprecedentedly expansionary, the liquid asset holdings of the users of liquidity have not increased dramatically. If anything, the response appears comparatively muted and consistent with

pre-existing trends. Combined with a possible increase in the worldwide demand for safe, U.S. dollar-denominated assets, it should perhaps be not too surprising that inflation has remained low and stable and that nominal interest rates have remained low. It is still an open research question of how much of these outcomes can be attributed *purely* to inconsistencies in the implementation of government policy and how much to the response of private agents to changes in the economic environment and policy.

*Fernando M. Martin is an economist at the Federal Reserve Bank of St. Louis. For more on his work, see <https://research.stlouisfed.org/econ/martin>.*

ENDNOTES

- 1 U.S. Treasury securities are debt instruments issued by the U.S. Department of the Treasury. Securities backed by agencies and government-sponsored enterprises are debt instruments issued by a federal budget agency (such as the Tennessee Valley Authority) or a GSE (such as Fannie Mae).
- 2 For further details, see Martin (2013, 2014).
- 3 Treasury securities comprise debt held by the public (including the Fed) and by federal government employee retirement funds. Notably, this category does not include holdings by federal agencies, such as the Social Security Trust Funds. Although debt levels vary across definitions, the increase since 2007 is similar regardless of the one used.
- 4 For a complementary explanation, which focuses on the conceptual merits of QE, see Williamson.
- 5 To be clear, “other financial institutions” include insurance companies, pension funds, mutual funds (except money market), security brokers and dealers, among others.
- 6 “Consolidated” means that there is no double counting. For example, a household holding \$100 worth of mutual fund shares, which in turn represent claims to holdings of \$100 worth of Treasuries, counts only as \$100 worth of total consolidated liquid financial assets.

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# Unemployment by Industry: Duration Must Be Considered, Too

By YiLi Chien and Paul Morris



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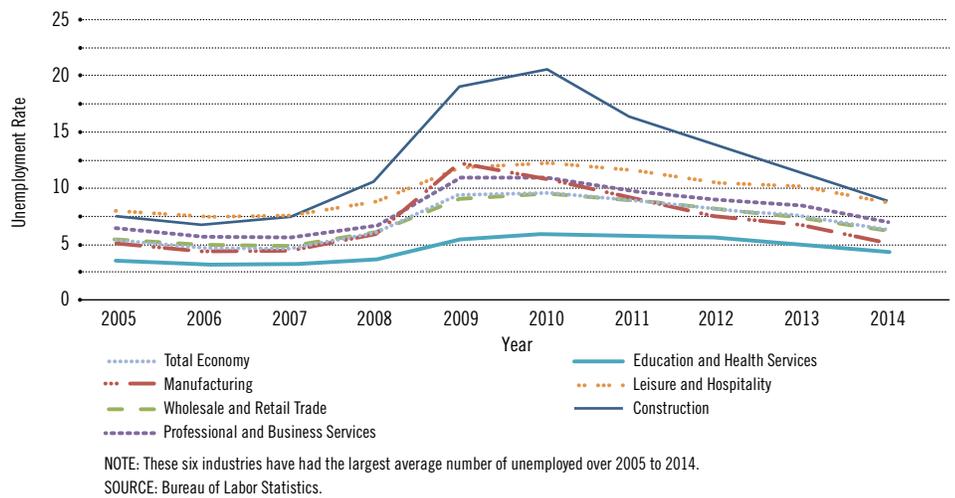
To better understand unemployment in key industries, not only the unemployment rate but the duration of unemployment in those industries needs to be examined. Focusing only on the former could lead to misguided efforts to assist the unemployed. This article investigates the behavior of both the unemployment rate and the duration of unemployment across industries from 2005 through 2014, a period that includes the Great Recession (2007-09).

### Strong Co-movement Trend

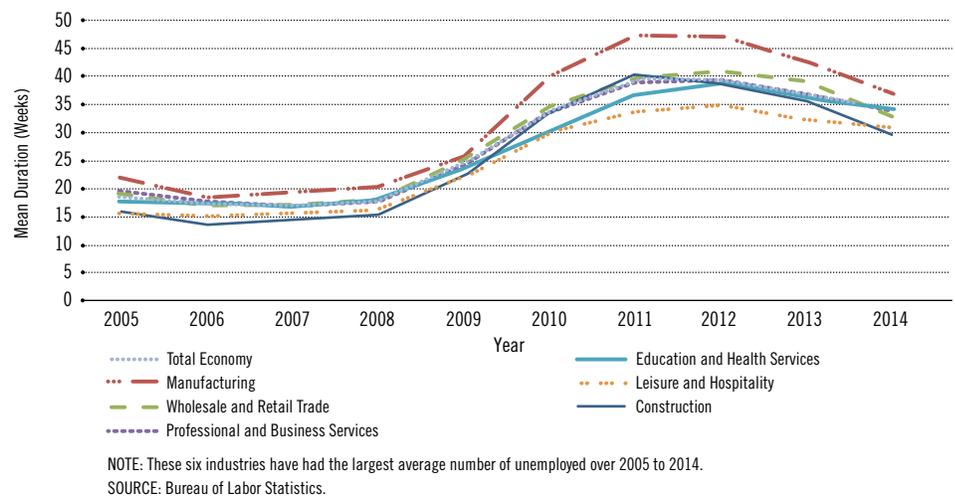
We obtained industry-level data on unemployment rates, unemployment duration and the total number of unemployed from the Bureau of Labor Statistics for 12 major industries.<sup>1</sup> Figure 1 shows that the unemployment rates across the six industries with the largest average number of unemployed move together over time. The unemployment rates rose sharply for all six after the recession began in 2007 and gradually began to fall after 2010. Although the rates moved together, some industries were hit harder than others. For example, the unemployment rates of the manufacturing sector and of the leisure and hospitality sector rose more than the rate for the education and health services sector after the beginning of the recession; this shows that there is some heterogeneity in the rates despite the obvious co-movement.

Similarly, the *duration* of unemployment across these industries shares this co-movement effect. Figure 2 plots the mean unemployment duration for the same six industries. The durations were relatively low before the recession and sharply increased during the recession. As the economy continued its recovery, they gradually came down,

**FIGURE 1**  
**Unemployment Rate by Industry**



**FIGURE 2**  
**Mean Duration of Unemployment by Industry**



starting in 2012.

In terms of heterogeneity across industries, some industries tended to have shorter unemployment spells than others.

These differences were generally persistent throughout the sample period. One distinguishing feature of unemployment duration is its lagged response to the business

cycle. Comparing Figures 1 and 2, duration reached its peak across all industries later than the unemployment rate. This lag persists today, with the newest data showing that the various unemployment rates have returned to their precrisis levels while the various unemployment durations are still far above where they were in 2007. It will be interesting to see whether the durations will revert eventually.

### Negative Correlation

It is reasonable to suspect that there should be a positive relationship between the unemployment rate and unemployment duration. A higher-than-average unemployment rate in a specific industry may indicate that this industry is experiencing an economic hardship. Those workers laid off from that industry might face limited job opportunities, thereby lengthening their time spent unemployed. However, the data show that the average unemployment rate for each industry from 2005 to 2014 and the average mean duration for each industry across the same time period exhibit a negative relationship across industries (correlation coefficient of  $-0.67$ ).

Figure 3 demonstrates this result. Each circle represents one industry, and the size of the circle represents the number unemployed in that industry. Clearly, the relationship between the unemployment rate and duration is negative: An industry with a higher unemployment rate tends to have a shorter unemployment duration. Take the construction sector and the leisure and hospitality sector as examples. Both industries have a higher than average unemployment rate from 2005 to 2014, yet their unemployment durations are two of the lowest among all industries.

However, the negative relationship is not perfect. An exception is the education and health services sector, which has both a relatively low unemployment rate and a relatively short duration. These workers are less likely to be unemployed and are more likely to quickly find a job after becoming unemployed.

### Implications and Explanations

Our results suggest that focusing only on the unemployment rate might be misleading, especially in terms of welfare

analysis for unemployed workers. In some industries, the unemployment duration is relatively short even with a higher-than-average unemployment rate. Thus, the welfare impact for those unemployed workers might be overestimated if we look only at the unemployment rate. On the other hand, workers in some other industries might experience longer unemployment duration even if they are less likely to be unemployed. For these workers, the welfare cost of being laid off could be relatively high.

Our analysis contains a potential weakness, as the shorter unemployment duration could be the result of a quick job-finding rate or the effect of discouraged workers leaving the labor force. It is possible that during the severe recession in 2007 some of the unemployed workers stopped looking for a job and left the labor force because of a very low chance of getting a job in the short run. To remedy this potential weakness in our analysis, we need to rely on the flow data that describe where these unemployed workers go as they transition from unemployment. But because of the limited accessibility of job-flow data across industries, this aspect of the research will have to wait. However, we did find that the

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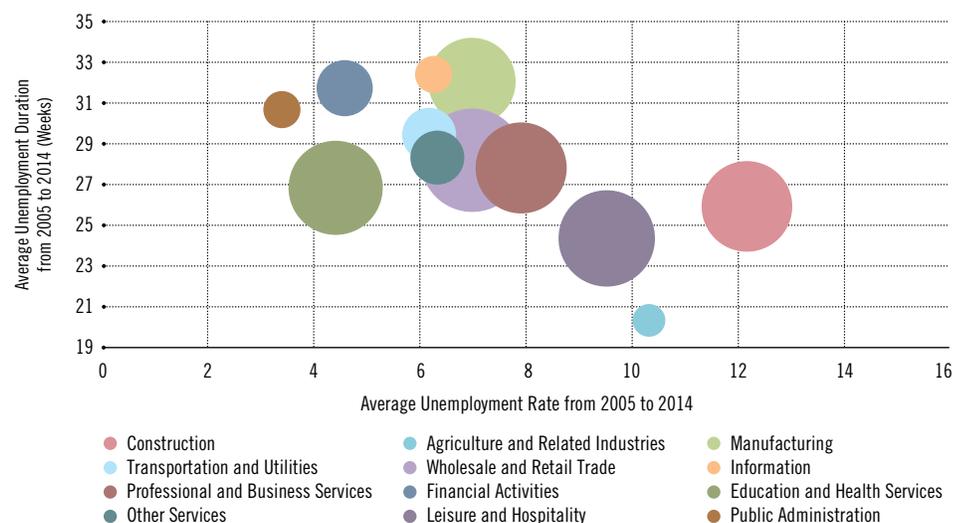
### ENDNOTES

- 1 Data on the mining, quarrying, and oil and gas extraction industry were also available but incomplete. For information on each industry included in our analysis, refer to the Industries at a Glance page at [www.bls.gov/iag/tgs/iag\\_index\\_naics.htm](http://www.bls.gov/iag/tgs/iag_index_naics.htm).
- 2 See Topel for the empirical evidence on firm-specific human capital.

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**FIGURE 3**  
**Unemployment Duration vs. Unemployment Rate**  
**Weighted by Number Unemployed**



NOTE: The scatterplot shows the average mean unemployment duration versus the average unemployment rate for the 12 industries for which we had sufficient data. For each industry, we averaged the unemployment rates and the mean durations over the years 2005 to 2014 to come up with a single point. The size of the bubbles corresponds to the average number of unemployed for each industry.

SOURCE: Bureau of Labor Statistics.

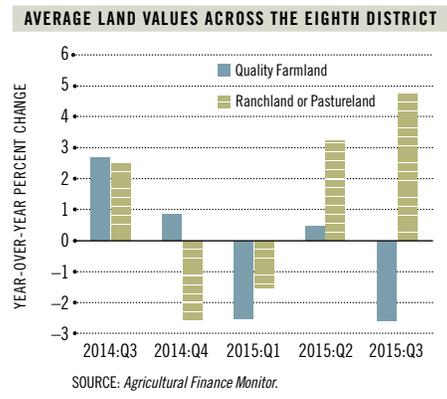
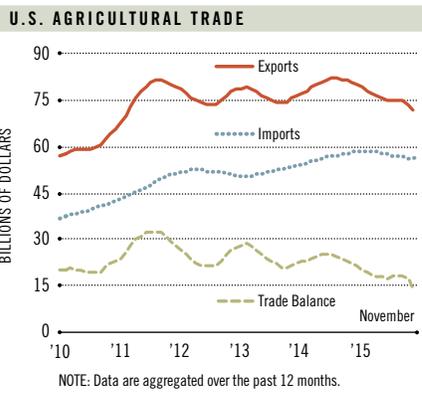
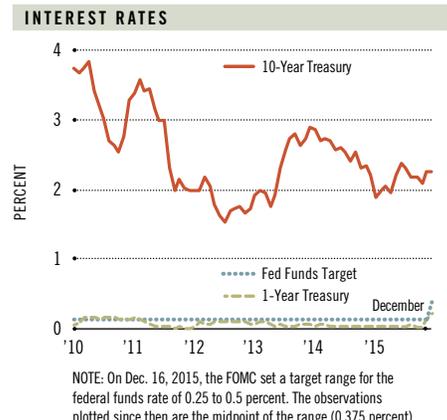
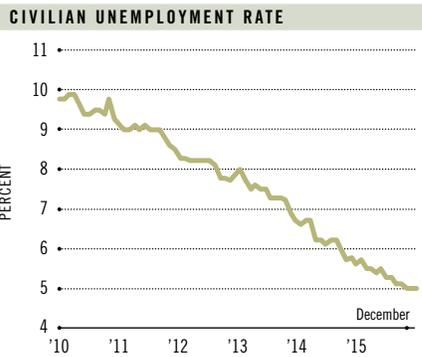
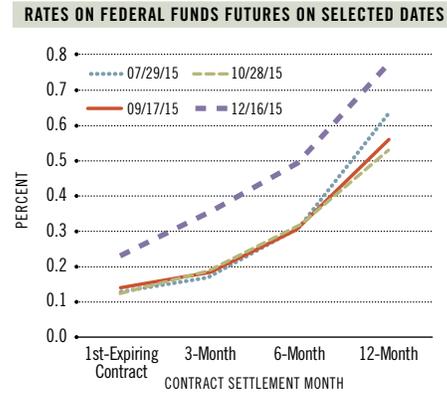
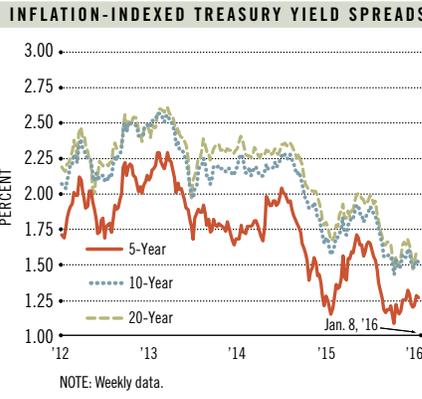
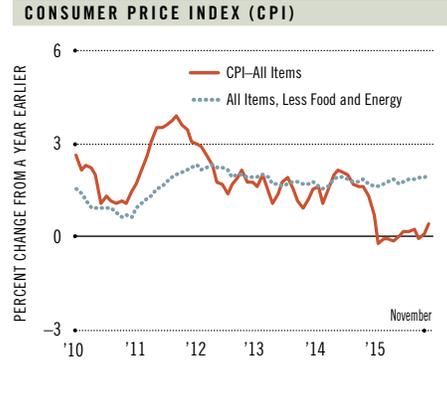
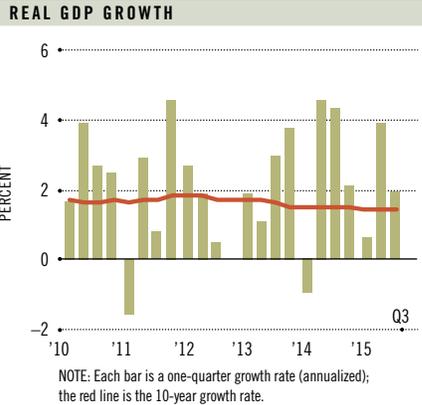
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negative relationship between unemployment duration and the unemployment rate across industries was persistent throughout the business cycle, as the relative industry rankings remained mostly stable for both measures. This indicates that the effect of discouraged workers might not be the major explanation.

Then what else could explain this relationship? The reason might come from some specific characteristics of the industry, as opposed to the level of the unemployment rate. One potential explanation is what is referred to as firm-specific human capital.<sup>2</sup> For example, if a worker is equipped with a skill that is useful only within a specific industry, or even a specific company, then it could be hard to reallocate this worker to another job, which means that job-searching frictions—or the difficulties that arise in the hiring process because of mismatches in preferences between employers and employees—might be asymmetric from industry to industry. This asymmetric friction affects the behavior of employers, who are more reluctant to fire workers if it is difficult to replace them. By the same logic, some workers are easier to be fired and could find another job more quickly because of the low job-searching friction. Therefore, some industries could have a higher unemployment rate but a shorter unemployment duration on average. 

YiLi Chien is an economist and Paul Morris is a research analyst, both at the Federal Reserve Bank of St. Louis. For more on Chien's work, see <https://research.stlouisfed.org/econ/chien>.

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](http://www.stlouisfed.org/economyataglance).



# Despite Crosscurrents, Economy Is Showing Signs of Strength

By Kevin L. Kliesen

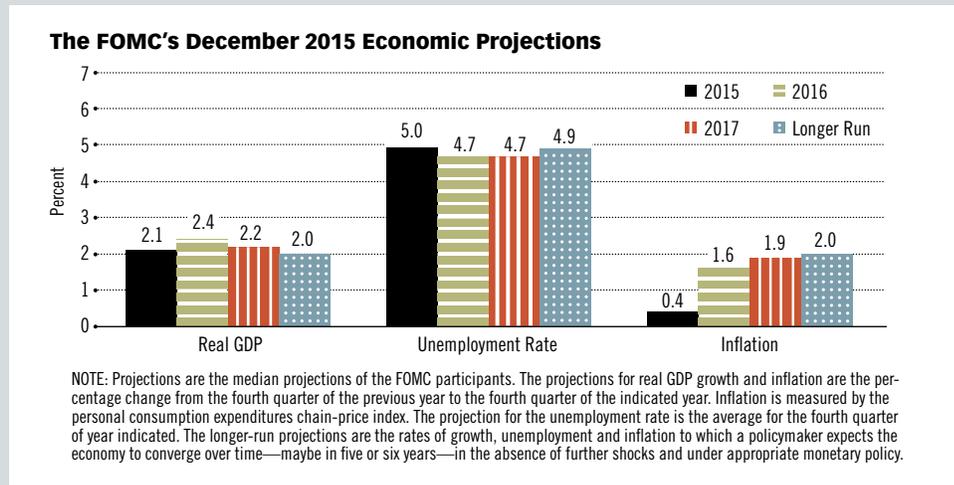
In 2015, the global economy was projected to have grown at its slowest pace since the financial crisis in 2009. Slowing global growth over the past several years reflected slow or slowing growth in China, Japan, Europe and several emerging market economies. In response, prices for key commodities, such as crude oil and copper, have fallen sharply. Of course, the decline in crude oil prices also reflects the step-up in global production in key oil-producing countries, including Saudi Arabia and the United States, where the fracking revolution increased domestic production by nearly 80 percent from mid-2011 to early 2015.

Sluggish economic conditions spurred several of the world's major central banks to enact expansionary monetary policies. For example, in early December 2015, the European Central Bank extended its asset purchase program for an additional six months and reduced its deposit rate to -0.3 percent from -0.2 percent.

## What's in Store for the U.S.?

Compared with most other advanced economies, the U.S. economy has registered steady, albeit modest, growth since the recession ended in June 2009. This moderate growth has been accompanied by low inflation, low interest rates and a steadily falling unemployment rate. But perhaps more important, after seven years of a near-zero policy rate and three rounds of quantitative easing, the Federal Open Market Committee (FOMC) voted Dec. 16 to raise its intended federal funds target rate by 25 basis points. This was the first increase since late June 2006. The relatively stronger growth in the United States, coupled with a modest divergence in monetary policies, has contributed to a sharp appreciation of the value of the dollar.

For most of the past year, much of the U.S. economy's strength was concentrated in consumer spending and housing activity. In 2015, auto sales were the strongest on record, and housing starts were on pace to be the strongest since 2007. However, some of the



key October data were softer than expected. This development, coupled with a relatively large increase in household saving in October and a modest erosion in consumer confidence in November, suggests that consumers may have been a bit skittish heading into the final months of 2015. That said, surveys of retailers and consumers showed that household spending during the holiday season was expected to be significantly larger than a year earlier.

Among the pockets of weakness in the U.S. economy are those in the nonautomotive manufacturing sector and, more generally, in export-intensive industries. The sluggish pace of activity in parts of the industrial sector reflects falling oil prices, which have caused a sharp pullback in drilling activity, a stronger dollar and economic weakness in several key export markets. In addition, as highlighted in recent issues of the St. Louis Fed's *Agricultural Finance Monitor*, farmers are postponing equipment purchases and other capital expenditures in response to a second consecutive year of declining real net farm income.

Despite some crosscurrents in the data, labor market conditions remained favorable at the end of 2015. For the year, nonfarm payroll job gains averaged 221,000 per month, the unemployment rate averaged 5.3 percent (it was 5 percent in each of the last three months) and real after-tax personal income increased briskly. Importantly, job gains were well above the levels necessary just to keep the unemployment rate constant. Given the favorable outlook for job growth, the unemployment rate should continue to fall in 2016.

Overall, the expectation of continued low

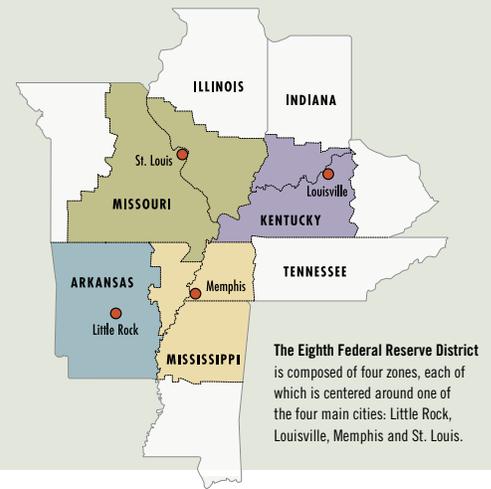
energy prices, vibrant labor markets, low interest rates and healthy financial market conditions should keep consumer spending and home sales and construction growing at a healthy pace over the near term. These trends should also keep business spending on capital goods growing at a moderate pace.

Headline (that is, all items) inflation likely ended 2015 well below the Fed's 2 percent inflation target—something most other central banks have had to grapple with, as well. But the low headline inflation rate mostly reflects the sharp decline in crude oil prices. Measures of underlying inflation that attempt to remove transitory changes in prices show that inflation is much closer to the FOMC's 2 percent target. These measures include those produced by the Federal Reserve banks of Cleveland (trimmed mean consumer price index) and Dallas (trimmed mean personal consumption expenditures price index). Once oil prices stabilize—or maybe even rise slightly if some of the forecasts turn out to be right—headline inflation should rise from its current near-zero rate to something close to 2 percent. Oil prices, once again, are a wild card in the outlook. But even if inflation heads back up to 2 percent, the probability that inflation will exceed the Fed's target over the next 12 months is very low. That is the signal suggested by the St. Louis Fed's new inflation forecasting tool, the St. Louis Fed Price Pressures Measure. [Q](#)

Kevin L. Kliesen is an economist at the Federal Reserve Bank of St. Louis. Usa Kerdnunnong, a research associate at the Bank, provided research assistance. See <http://research.stlouisfed.org/econ/kliesen> for more on Kliesen's work.

# District's Patterns in Imports and Exports Sometimes Differ from Nation's

By Maximiliano Dvorkin and Hannah Shell



In the United States, the distribution of economic activity varies across the country. Different U.S. states tend to specialize in the production of some goods and services more than other states do. For this article, we compared trade activity in the states that make up the St. Louis Fed's District with trade activity at the national level. Understanding the regional characteristics of production and trade is important in order to gauge, for example, the effects of an increase in Chinese imports on local labor markets or the effects of a European recession on the auto industry. Our analysis here is descriptive but can be seen as a step toward understanding the effects of globalization on the District.

In broad terms, the average state in the District was slightly less active than the U.S. in terms of trade. In 2014, the U.S. imported \$7,362 and exported \$5,082 of goods per capita; the average state in the District imported \$7,023 and exported \$4,348 of goods per capita. The distribution varied widely across the states, though, and Illinois and Tennessee imported more than \$10,000 per capita—far more than the national average.

We used import and export data from the Census Bureau's Foreign Trade Statistics at the national and state levels for 2014.<sup>1</sup> We classified the goods according to the three-digit North American Industry Classification System (NAICS) and focused on the five largest export and import categories for the United States and on the top four trading partners for both the U.S. and District, namely Canada, Mexico, the European Union (EU) and China.<sup>2</sup>

## Trade by Major Partner

Similar to the U.S., the average District state imported more from China than from

## Imports and Exports per Capita in 2014 by Major Commodity

	U.S.	8D Avg.	Ark.	Ill.	Ind.	Ky.	Miss.	Mo.	Tenn.	
IMPORTS	Computer and Electronic Products	\$1,147	\$1,160	\$142	\$1,967	\$919	\$1,423	\$358	\$157	\$3,156
	Transportation Equipment	1,116	1,018	722	617	1,216	1,950	573	433	1,612
	Chemicals	645	976	121	1,037	2,010	1,394	256	486	1,530
	Machinery, Except Electrical	504	627	270	981	579	985	448	290	838
	Petroleum and Coal Products	257	37	10	20	20	11	165	30	4
EXPORTS	Computer and Electronic Products	656	374	107	568	280	452	304	94	811
	Transportation Equipment	858	1,139	641	624	1,591	3,118	323	548	1,129
	Chemicals	628	672	281	590	1,324	930	413	399	765
	Machinery, Except Electrical	478	437	190	1,003	643	405	157	243	416
	Petroleum and Coal Products	367	256	8	413	26	7	1,325	9	7

SOURCE: Authors' calculations using data from the Census Bureau's Foreign Trade Statistics. NOTE: 8D=Eighth District.

the other three areas and exported more to Canada than to the other three. In all District states, imports from China exceeded exports to China. Tennessee imported the most from China in 2014, with \$3,868 of goods per capita, which is more than twice the amount of U.S. imports from China per capita that year. Illinois imported almost the same amount from Canada in 2014, at \$3,529 per capita. Illinois, Indiana and Kentucky all exported substantially more to Canada per capita than the U.S. did in 2014.

On average, trade with the European Union in the District was similar to that of the nation, but a few District states traded heavily with the EU. Indiana, Kentucky and Tennessee imported more than \$2,000 per capita from the EU in 2014. Kentucky also exported quite a bit to the EU, at \$1,752 per capita in 2014.

Trade with Mexico was more evenly distributed across the District states. On average, the District imported \$822 per capita from Mexico and exported \$524 per capita to Mexico in 2014. Kentucky imported the most

from Mexico, at \$1,246 per capita, exceeding the national average of \$922. Indiana exported the most to Mexico at \$761 per capita in 2014, only slightly more than the U.S. at \$753.

## Trade by Major Commodity

A well-known fact in international economics is that a large portion of trade across countries involves similar types of goods. This is sometimes referred to as intra-industry trade.<sup>3</sup> The table breaks down imports and exports in the District's states by major trading commodity and reveals that, in most cases, a large volume of imports and exports occurred across the same industries.

Similar to the U.S., the largest import category in the District was computer and electronic products. On average, each District state imported \$1,160 per capita of computer and electronic products in 2014. The U.S. imported slightly less, at \$1,147. Tennessee was the largest importer of these products in the District, which is consistent with the state's large amount of imports from China.

In contrast, the District exported less in computer and electronic products than the nation did, averaging \$374 per capita in 2014 compared with \$656 for the nation. This may reflect the fact that the computer and electronics industry is not as important in the District, in terms of value added or economic activity, as in the nation.<sup>4</sup>

Transportation equipment was the second-largest import commodity for both the District and nation, at over \$1,000 per capita in 2014 for both regions. Kentucky was the largest importer of transportation equipment in 2014, at \$1,950 per capita. In terms of exports, the District and the nation exported more transportation equipment than other commodities in this group. In 2014, the District exported \$1,139 per capita on average of transportation equipment; the U.S. exported \$858 per capita. The largest exporter of transportation equipment was Kentucky, at \$3,118 per capita. Indiana and Tennessee also exported a large amount. The states that traded the most in transportation equipment were also the states with a large share of value added in transportation equipment. Indiana, Kentucky and Tennessee all had a larger share of value added in transportation equipment than did the District and nation.

Imports and exports of chemicals and machinery in the District were broadly similar to national patterns. Indiana imported more than \$2,000 per capita of chemicals in 2014, and Kentucky and Illinois imported more than \$900 per capita of nonelectrical machinery. The average District state exported \$672 per capita in chemicals and \$437 per capita in nonelectrical machinery. These numbers were similar to the U.S. export numbers, at \$628 per capita and \$478 per capita, respectively.

The notable difference between District and national imports was in the category of petroleum and coal products. The U.S. imported about \$257 per capita in petroleum and coal in 2014, while the District, on average, imported only \$37 per capita. Among the District's states, Mississippi imported the most, at \$165 per capita, while imports in Tennessee were essentially nonexistent.

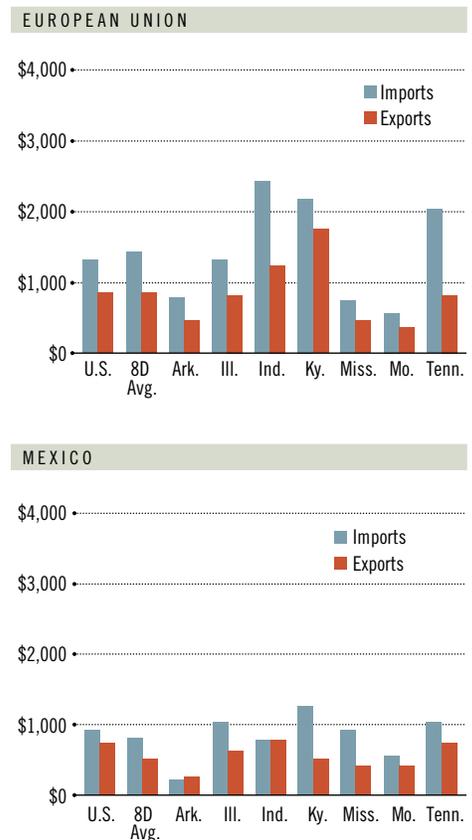
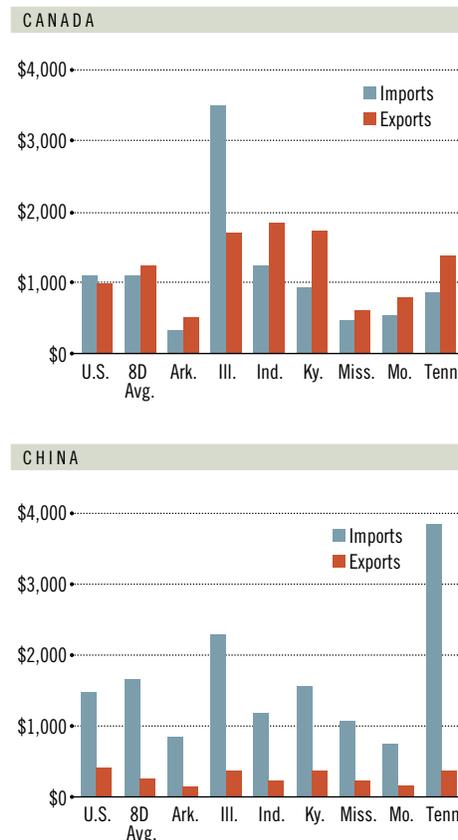
## Conclusions

The District states' imports and exports in 2014 were mostly similar to those of the nation. Kentucky, Indiana, Tennessee and

Illinois traded the most, while Missouri, Mississippi and Arkansas were not very active in terms of imports and exports. The most-traded commodities in the District states came from industries with a large share of value added, with the exception of computers and electronics. This implies that, for the most part, the patterns of international trade were linked to industries with a high level of economic activity in the District. [1](#)

*Maximiliano Dvorkin is an economist and Hannah Shell is a research associate, both at the Federal Reserve Bank of St. Louis. For more on Dvorkin's work, see <https://research.stlouisfed.org/econ/dvorkin>.*

## Trade per Capita by Major Partner



SOURCES: Authors' calculations using data from the Census Bureau's Foreign Trade Statistics. NOTE: 8D=Eighth District.

## ENDNOTES

- Due to data limitations, our analysis considered data for each state in the District in its entirety even though portions of six of the seven states in the District actually lie in a neighboring Fed district.
- When the EU is considered as one trading partner, trade between the U.S. and the EU exceeds U.S.-Japan trade. When individual countries are considered, Japan is a larger trading partner than any individual European country.
- The early works of Grubel and Lloyd and of Greenaway and Milner analyze the empirical patterns of trade across countries and find that most trade is intra-industry.
- An industry's value added, or gross product, is calculated as incomes earned by labor and capital plus the expenses incurred during production. For example, wages, salaries, profits earned by business owners, and taxes that count as business expenses are all included in an industry's value added.

## REFERENCES

- Greenaway, David; and Milner, Chris. "On the Measurement of Intra-Industry Trade." *The Economic Journal*, December 1983, Vol. 93, No. 372, pp. 900-08.
- Grubel, Herbert G.; and Lloyd, Peter J. *Intra-Industry Trade: The Theory and Measurement of International Trade in Differentiated Products*. New York: Wiley, 1975.

## Jefferson City, Mo., Facing Same Struggles As Other State Capitals

By Charles S. Gascon and Evan Karson

The skyline of Jefferson City is dominated by the massive dome atop the Missouri state Capitol, a reminder of the central role the state of Missouri plays in the city's economy.



What is now the seat of power for the Missouri legislature was just a trading post between St. Louis and Kansas City a hundred or so years ago; the city's central location in Missouri, however, enabled Jefferson City to undergo expansive population growth in the late 19th and early 20th centuries.

Today, with a population of 43,132, Jefferson City is the 15th largest city in the state. The city stands as the hub of a four-county region of about 150,000 people. The four counties—Callaway and Cole, along with the more rural Moniteau and Osage—comprise the Jefferson City metropolitan statistical area (MSA). The MSA has experienced gradual population growth over the past 10 years, rising by 6.4 percent since 2004; over the same period, Missouri's population grew by 5.5 percent and the nation's by 8.9 percent.

### Government's Shrinking Role

Prior to the financial crisis and last recession, government activities *directly* accounted for almost 29 percent of the region's output, as measured by real gross metropolitan product (GMP). This

*Anecdotal information in this report was obtained from surveys and interviews with local business contacts in Jefferson City conducted by the authors. The anecdotes should be interpreted with caution because the sample may not accurately reflect the industrial composition of the local economy. Some quotes were lightly edited to improve readability.*

*"Increased spending and hiring at the state level translates into better business for us. What they pay their employees also affects our local job market."*

—Jefferson City area banker

percentage was much greater than that in other nearby state capitals—in Little Rock, Ark., it was 16.1 percent, and in Springfield, Ill., it was 21.7 percent, for example. The Jefferson City MSA's share was also three times greater than that in nearby Joplin, Mo., which is roughly the same size.

The state of Missouri is also the largest employer in the metro area, accounting

for 26 percent of the region's jobs in 2014. As the largest employer in the region, the government makes decisions about hiring and changes in wages that can ripple out to the private sector: Private-sector businesses compete for the same workers, and government agencies (and their employees) purchase goods and services from the private sector. As a consequence, the general stability of the large public sector helped mitigate the recessionary effects during the depth of the financial crisis. The pullback by government during the recovery, however, has restrained growth in the region in recent years.

### Health Care

Two of the region's largest employers are hospitals, Capital Region Medical Center and SSM Health St. Mary's Hospital. More broadly, the industry accounts for 10 percent

*"Both major hospitals in Jeff City have recently invested large capital expenditures into their hospital systems."*

—Jefferson City real estate contact

of the region's employment and 7 percent of total output. Like government, the sector is less sensitive to changes in the overall economy. Health care has steadily added jobs throughout the recession, making this sector a critical source of growth.

### Recession in Jefferson City

From 2007 to 2009 (the span of the Great Recession), federal, state and local governments were able to net positive job growth, and the region suffered only minimal declines in output. This helped to cushion the loss of over 2,000 jobs in the private sector. During these recession years, the Jefferson City MSA saw a much less dramatic decline in real output relative to the national average. Real GMP in Jefferson City contracted each year from 2007 to 2009, but never declined more than 0.3 percent in a single year. The recession was much sharper nationwide and in the state of Missouri. For example, in 2009, real GDP shrank 2.8 percent nationally and 2.7 percent in Missouri.

Another key contributor to the resilience of the MSA's economy has been its stable housing market. During the housing boom from 2004 to 2007, house prices rose by 12.6 percent in the MSA. In contrast, the national index surged 26.6 percent. After national prices collapsed during the recession, they rebounded by 16 percent in 2013. Meanwhile, house prices in Jefferson City were much less turbulent, climbing steadily by 1.5 percent each year, even during the national housing collapse.

### Recovery

While steady government employment was able to keep the MSA's economy afloat during the recession as the private sector contracted, the dynamics have reversed during the recovery as state governments around the nation have looked for ways to reduce their costs amid lower tax revenue. In Missouri, inflation-adjusted state tax revenue peaked in 2007 and fell 13 percent to a low point in 2011. While revenue has started to increase in recent years, growth has been slow; revenue in 2014 was still 7 percent below its peak.

As a result, government layoffs at the state level picked up following the recession,

offsetting the modest expansion in the private sector. The result was a period of flat growth after 2009. Still, the unemployment rate in Jefferson City dropped quickly, starting in 2010. From 2010 to 2011, the rate fell from 7.7 to 6 percent, largely due to a shrinking labor force. Real gains in overall employment were minimal, with payrolls rising by a mere 200 jobs in 24 months.

By 2012, economic activity in the private sector had begun to accelerate. Employment at private firms in the MSA rose 2 percent from 2012 to 2013, while real GMP grew at an annual average rate of 1.5 percent. From 2012 to 2014, the health care and education sector generated more employment gains than any other sector, accounting for over 25 percent of the area's growth in jobs. Growth in the health care sector has also provided critical improvements in wages, which rose 2 percent from 2013 to 2014 and 13.6 percent since 2005.

*"There seems to be a growth spurt in construction—hospitals, schools, rec center, etc."*

—Area community wholesaler

Despite these windfalls in Jefferson City's private industries, persistent contraction in the public sector, particularly at the state level, has prevented substantial overall economic gains. The government has progressively been shrinking employment since 2005, shedding nearly 10 percent of its workforce over the past 10 years.

### Current Economic Conditions

Most key economic indicators provide signs that the economy still is in the process of adjusting to a new normal following the recession and sectoral shift. The Jefferson City MSA experienced steady job growth in 2014 and through most of 2015, resulting in about an additional 1,000 jobs. The unemployment rate in the MSA was 4 percent in November, the lowest in nearly a decade. However, total employment in the region is still below prerecession levels, and job growth is only marginally stronger than a year ago.

The regional housing market has begun to pick up in the past couple of years after a



© CAPITAL REGION MEDICAL CENTER

The health care industry is one of the main drivers in the Jefferson City MSA, accounting for 10 percent of the region's employment and 7 percent of total output. The two hospitals, Capital Region Medical Center (above) and SSM Health St. Mary's Hospital, employ more than 2,400 combined.

### MSA Snapshot

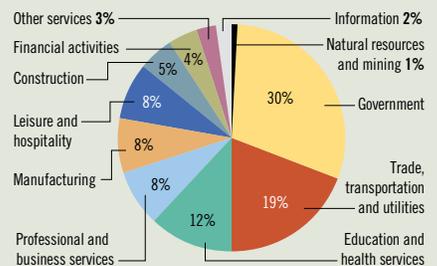
#### Jefferson City, Mo.

Population	43,132
Population Growth (2010-2014)	0.70%
Percentage with Bachelor's Degree or Higher	25%
Percentage with a HS Degree or Higher	88%
Per Capita Personal Income	\$38,463
Median Household Income	\$51,293
Unemployment Rate (November)	4%
Real GMP (2014)	\$5.97 billion
GMP Growth Rate (2014)	-1.94%

#### Largest Employers

State of Missouri	14,208
Jefferson City Public Schools	1,556
Scholastic Inc.	1,500
Capital Region Medical Center	1,411
SSM Health St. Mary's Hospital	1,014

#### Industry Breakdown by Employment



SOURCE: U.S. Bureau of Economic Analysis.



period of stagnancy from 2009 to 2013. Since 2014, house prices are up 6 percent, which represents a larger increase in home prices than in the previous eight years combined.

### Outlook

Local businesses in Jefferson City indicate that business activity is gradually increasing. About half of the contacts surveyed in November for this article reported higher sales from a year earlier. Levels of sales since Jan. 1, 2015, met expectations for 53 percent of firms and exceeded expectations for 11 percent.

Looking ahead, the majority of business contacts anticipate economic conditions to remain the same in 2016. Sixty-four percent of firms do not expect their employment

*“The region needs to proactively embrace technology-based opportunities for new business/job creation. The workforce needs to be prepared for a technology-based economy.”*

—Jefferson City engineer

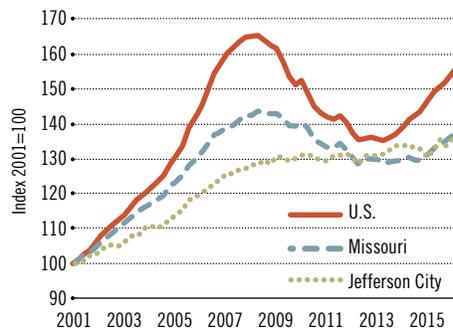
levels to change in the year to come. These findings were only slightly less optimistic than those for the businesses surveyed across the St. Louis Fed’s entire Eighth Federal Reserve District.

One of the main challenges that the Jefferson City MSA faces is in attracting young, educated professionals. Many business contacts in the MSA reported that a lack of skilled labor limits firms’ abilities to grow and innovate. Several contacts also noted that the area falls short in education overall. Businesses reported that schools and universities in the region could increase their emphasis on the teaching of technical skills required for the jobs in highest demand in today’s economy. Currently, Jefferson City lags behind the U.S. in higher-level educational attainment. Twenty-five percent of the local population 25 and older has a bachelor’s degree, compared with 29 percent nationwide.

Another way of attracting labor would be to offer higher wages; however, of over 100 business contacts surveyed, only 18 percent are increasing wages in order to attract new, skilled employees.

FIGURE 1

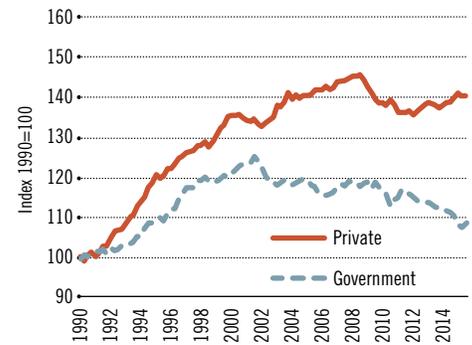
### House Price Index



SOURCE: Federal Housing Finance Agency.

FIGURE 2

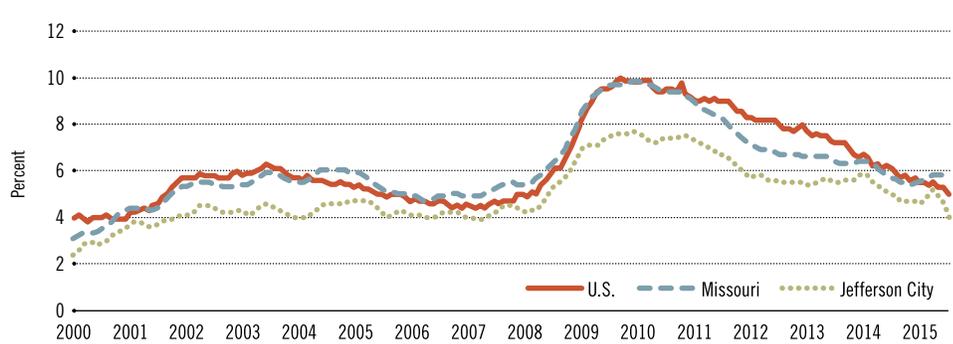
### Jefferson City Payroll Employment



SOURCE: Bureau of Labor Statistics.

FIGURE 3

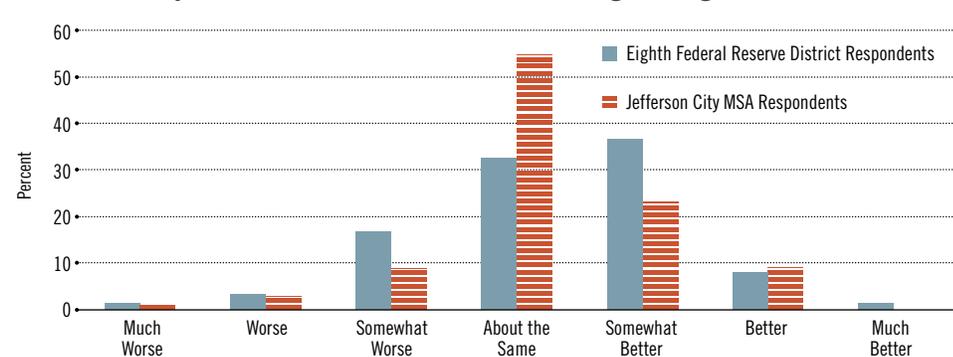
### Unemployment Rate



SOURCE: Bureau of Labor Statistics.

FIGURE 4

### How Do You Expect Local Economic Conditions to Change during 2016?



NOTE: This question was posed in a recent survey by the authors to business contacts in the Jefferson City MSA and to business contacts throughout the district covered by the St. Louis Fed. More than 100 from the MSA responded; more than 150 from across the seven-state area did.

As in many other state capital regions, state government finances are likely to play a significant role in the economy of the Jefferson City MSA. An improving economy with more jobs as well as higher incomes and spending, should boost tax revenue, and there are signs that state government layoffs have slowed. This combination should alleviate some of the economic strain on the region. Nonetheless, there are no indications that the public sector will drive growth as it

has in the past; so, private firms will have to continue to grow in order for the regional economy to maintain its current level of output growth. **Q**

*Charles S. Gascon is a regional economist at the Federal Reserve Bank of St. Louis. For more on his work, see <https://research.stlouisfed.org/econ/gascon>. Research assistance was provided by Evan Karson, an intern at the Bank.*

ASK AN ECONOMIST



**George-Levi Gayle** is an economist at the Federal Reserve Bank of St. Louis, where he has worked since May. His research focuses on family and gender issues in labor markets, the effect of information friction on earnings and compensation, and the estimation of semi-parametric models. Originally from Jamaica, he enjoys music, sports and travel. For more on his research, see <https://research.stlouisfed.org/econ/gayle>.

Gayle sailing off the coast of France in 2010.

**Q:** *Why are the earnings of children so close to those of their parents? Is this relationship the same for blacks and whites?*

**A:** In a recent paper, my co-authors, Limor Golan and Mehmet Soytas, and I<sup>1</sup> wrote that the structure of the family and the division of labor within the household were the main sources of the correlation of earnings across generations. For a long time, the economics literature has included ample documentation on the strong correlation between the earnings of fathers and sons, namely between 35 to 50 percent. (Now that women make up at least half of the workforce, this literature needs updating to cover the changing roles of females—both mothers and daughters.) Besides income, other factors need to be considered: how parents accumulate human capital in the labor market, the availability and returns to part-time jobs versus full-time jobs and the return to parental time invested in children.

In another study, we looked at the difference between blacks and whites in the intergenerational transmission of human capital.<sup>2</sup> We focused on the roles of time and income spent in the early childhood years to see how they impacted educational outcomes, if at all. We found that the time that parents spend talking to and otherwise interacting with their children is the major reason for the disparity in educational outcomes between black and white children. For example, for black and white parents who spent the same amount of time interacting with their children, there is no black-white attainment gap.

<sup>1</sup> Gayle, George-Levi; Golan, Limor; and Soytas, Mehmet A. "What Is the Source of the Intergenerational Correlation in Earnings?" Working Paper 2015-019A, Federal Reserve Bank of St. Louis, August 2015. See <https://research.stlouisfed.org/wp/more/2015-019>.

<sup>2</sup> See Gayle, George-Levi; Golan, Limor; and Soytas, Mehmet A. "What Accounts for the Racial Gap in Time Allocation and Intergenerational Transmission of Human Capital?" Working Paper 2015-018A, Federal Reserve Bank of St. Louis, August 2015. See <https://research.stlouisfed.org/wp/more/2015-018>.

NEW VIDEOS FOCUS ON ECONOMISTS' RESEARCH

The St. Louis Fed has released three more short videos that show our economists talking about their research. The videos are part of the Timely Topics series.

Two of the latest videos feature B. Ravikumar and focus on the gap between rich and poor countries.

The first video, which is 3½ minutes long, shows how the gap has grown exponentially since the days of Adam Smith. The second video, about 4 minutes, examines how a reduction in trade barriers might help to close this gap.



The third video looks at the research being conducted by David Wiczer on Social Security's disability insurance program. Given the large number of people "on disability" these days and the resulting public debate over such, Wiczer sought out to see how far from ideal is the current program we have in the United States. In this video, a bit over 4 minutes, Wiczer also explains that most everyone gets something out of this program—even those who are not disabled—because the insurance encourages people to take on dangerous jobs that need to be done.



Earlier videos in this series looked at the gold standard and the regional structure of the Federal Reserve System. To watch any of these videos, go to <https://www.stlouisfed.org/timely-topics>.

SAVE THE DATE FOR COMMUNITY BANKING RESEARCH CONFERENCE

Community bankers, academics, policymakers and bank supervisors from around the country will meet Sept. 28-29, 2016, at the Federal Reserve Bank of St. Louis for Community Banking in the 21st Century, the annual community banking research and policy conference sponsored by the Federal Reserve System and the Conference of State Bank Supervisors.

The conference, which features the latest community banking research, will be available to view via live webcast throughout both days.

To view the proceedings and the research of the 2015 conference, visit the conference website at [www.communitybanking.org](http://www.communitybanking.org). Details on the upcoming fourth annual conference will be available there later this year.



**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](http://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.**



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## NEXT ISSUE

### "The Secret Recipe" to China's Industrial Revolution



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Just 35 years ago, China was a vastly impoverished agricultural society. Today, it is a manufacturing powerhouse, producing 50 percent of the world's major industrial goods. After multiple failed attempts, China is finally succeeding in creating its own industrial revolution. But how? Yi Wen, a St. Louis Fed economist and China native, addresses the "secret" in the April issue of *The Regional Economist*.

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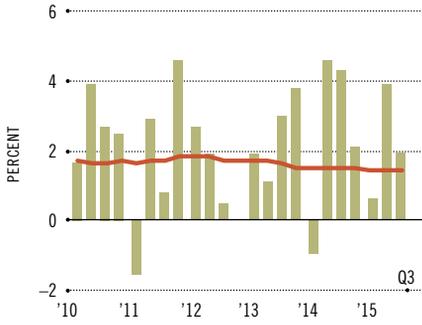
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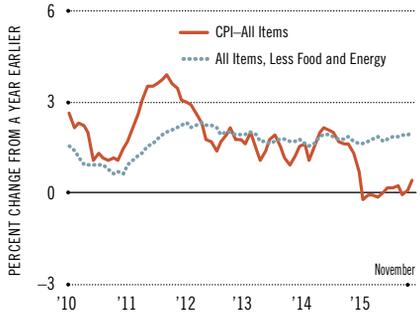


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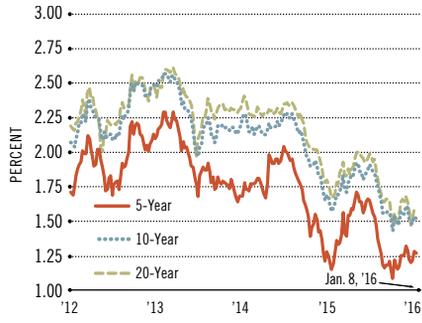
REAL GDP GROWTH



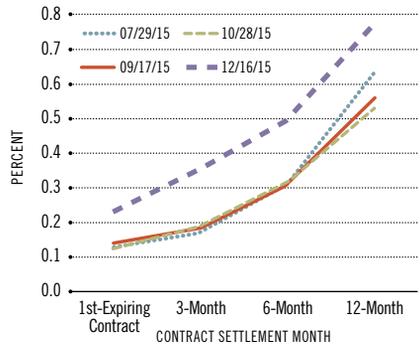
CONSUMER PRICE INDEX



INFLATION-INDEXED TREASURY YIELD SPREADS



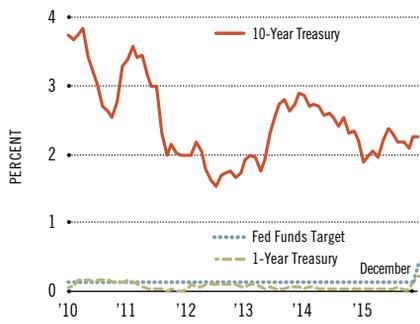
RATES ON FEDERAL FUNDS FUTURES ON SELECTED DATES



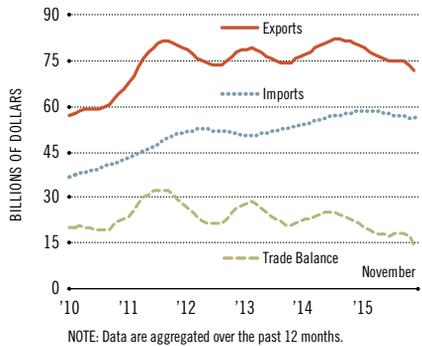
CIVILIAN UNEMPLOYMENT RATE



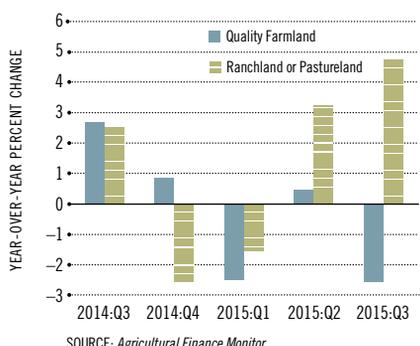
INTEREST RATES



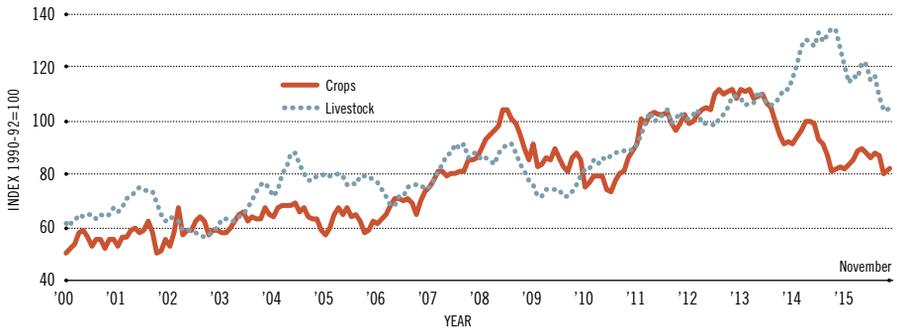
U.S. AGRICULTURAL TRADE



AVERAGE LAND VALUES ACROSS THE EIGHTH DISTRICT



## U.S. CROP AND LIVESTOCK PRICES

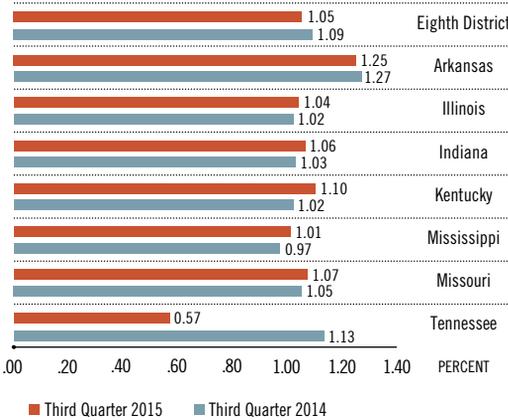


## COMMERCIAL BANK PERFORMANCE RATIOS

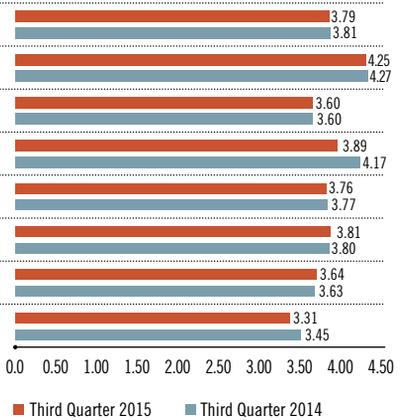
### U.S. BANKS BY ASSET SIZE / THIRD QUARTER 2015

	All	\$100 million- \$300 million	Less than \$300 million	\$300 million- \$1 billion	Less than \$1 billion	\$1 billion- \$15 billion	Less than \$15 billion	More than \$15 billion
Return on Average Assets*	1.03	1.03	1.00	1.01	1.01	1.14	1.08	1.02
Net Interest Margin*	2.99	3.81	3.81	3.78	3.79	3.81	3.80	2.81
Nonperforming Loan Ratio	1.60	1.18	1.20	1.12	1.15	1.11	1.13	1.74
Loan Loss Reserve Ratio	1.37	1.47	1.48	1.41	1.44	1.29	1.35	1.38

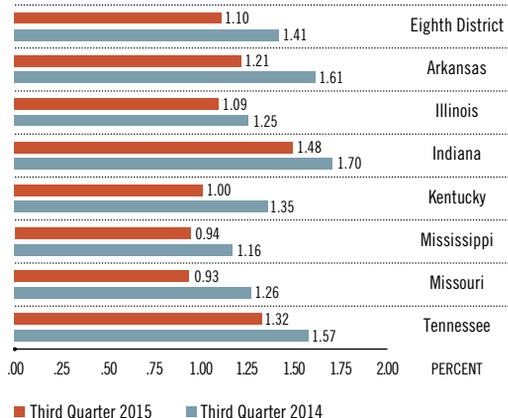
### RETURN ON AVERAGE ASSETS\*



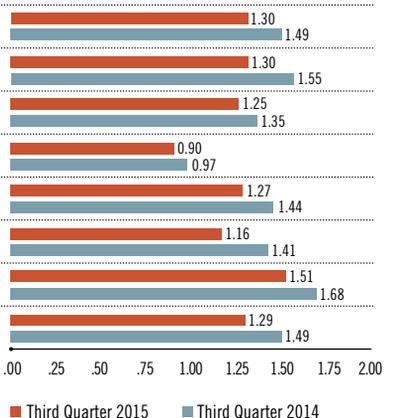
### NET INTEREST MARGIN\*



### NONPERFORMING LOAN RATIO



### LOAN LOSS RESERVE RATIO



NOTE: Data include only that portion of the state within Eighth District boundaries.  
SOURCE: FFIEC Reports of Condition and Income for all Insured U.S. Commercial Banks  
\* Annualized data.

For additional banking and regional data, visit our website at:  
[www.research.stlouis.org/fred/data/regional.html](http://www.research.stlouis.org/fred/data/regional.html).

## REGIONAL ECONOMIC INDICATORS

### NONFARM EMPLOYMENT GROWTH / THIRD QUARTER 2015

YEAR-OVER-YEAR PERCENT CHANGE

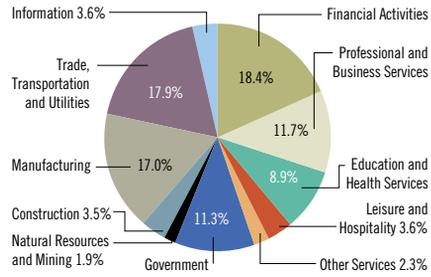
	United States	Eighth District †	Arkansas	Illinois	Indiana	Kentucky	Mississippi	Missouri	Tennessee
Total Nonagricultural	2.0%	1.5%	2.1%	0.6%	2.5%	1.9%	1.0%	1.2%	1.9%
Natural Resources/Mining	-9.8	-8.5	-6.3	-8.4	-6.8	-11.2	-8.9	-4.8	NA
Construction	3.4	2.3	14.7	4.0	-2.2	4.4	-5.5	1.0	NA
Manufacturing	1.0	0.9	-1.2	-1.4	2.5	2.2	1.4	1.8	1.7
Trade/Transportation/Utilities	2.0	1.6	0.7	0.6	4.2	0.8	0.6	0.7	3.0
Information	1.7	-1.0	1.0	-1.9	-1.1	1.0	1.8	-0.8	-2.1
Financial Activities	1.9	1.2	2.9	-0.5	1.4	3.8	2.5	1.8	2.0
Professional & Business Services	3.4	2.1	5.6	2.2	1.7	2.7	2.5	0.5	2.3
Educational & Health Services	2.8	1.9	3.6	1.0	3.7	3.3	0.9	1.1	1.3
Leisure & Hospitality	3.0	2.5	3.8	1.3	2.7	3.0	3.5	2.2	3.4
Other Services	1.1	-0.5	-0.6	-0.9	0.7	0.8	-1.9	-0.7	-0.9
Government	0.5	0.8	-0.2	-0.2	2.3	0.5	1.0	2.4	0.6

† Eighth District growth rates are calculated from the sums of the seven states. For Natural Resources/Mining and Construction categories, the data exclude Tennessee (for which data on these individual sectors are no longer available).

### UNEMPLOYMENT RATES

	III/2015	II/2015	III/2014
United States	5.2%	5.4%	6.1%
Arkansas	5.4	5.7	5.9
Illinois	5.6	6.0	6.5
Indiana	4.6	5.1	5.8
Kentucky	5.1	5.1	6.0
Mississippi	6.3	6.6	7.4
Missouri	5.6	5.8	5.7
Tennessee	5.7	5.8	6.6

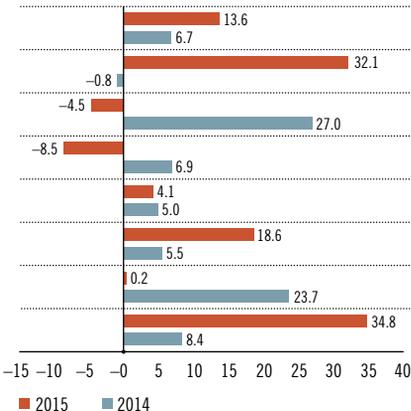
### DISTRICT REAL GROSS STATE PRODUCT BY INDUSTRY-2014



United States \$15,774 Billion  
District Total \$ 1,883 Billion  
Chained 2009 Dollars

### HOUSING PERMITS / THIRD QUARTER

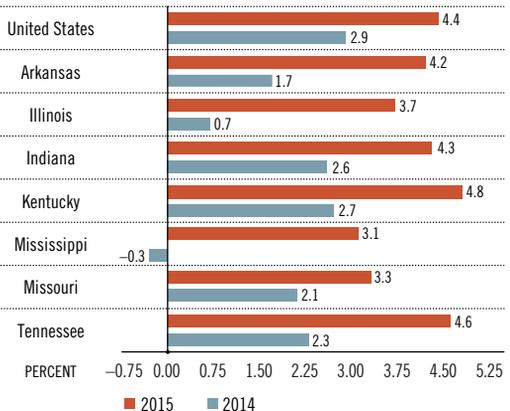
YEAR-OVER-YEAR PERCENT CHANGE IN YEAR-TO-DATE LEVELS



All data are seasonally adjusted unless otherwise noted.

### REAL PERSONAL INCOME\* / THIRD QUARTER

YEAR-OVER-YEAR PERCENT CHANGE



\*NOTE: Real personal income is personal income divided by the PCE chained price index.