

THE REGIONAL ECONOMIST

A Quarterly Review
of Business and
Economic Conditions

Vol. 25, No. 1

First Quarter 2017

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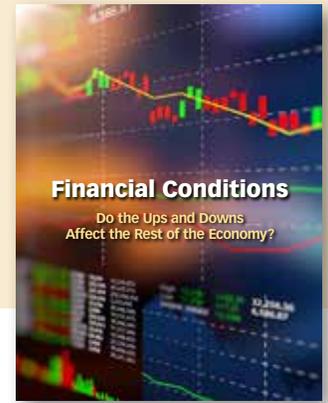
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Financial Conditions' Impact on the Rest of the Economy

By Hee Sung Kim and Juan Sánchez

Do changes in the conditions of financial markets lead to changes in real economic activity? This question can be answered by analyzing the ups and downs in sales and investments of firms with different needs of external financing. The evidence suggests the causal effect is small.



THE REGIONAL ECONOMIST

FIRST QUARTER 2017 | VOL. 25, NO. 1

The Regional Economist is published quarterly by the Research and Public Affairs divisions of the Federal Reserve Bank of St. Louis. It addresses the national, international and regional economic issues of the day, particularly as they apply to states in the Eighth Federal Reserve District. Views expressed are not necessarily those of the St. Louis Fed or of the Federal Reserve System.

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Corporate Inversions and Efforts to Stop Them

By Michelle Clark Neely and Larry D. Sherrer

Much attention has been paid lately to corporate inversions, in which U.S.-based multinational corporations move their parent companies to countries where taxes are lower. Past attempts to curtail such tax avoidance have had some success, but companies always find a way around the new rules. Would lowering tax rates in the U.S. help?

The Policy Rule Debate: A Simpler Solution

There has been growing public debate over how the Federal Reserve should conduct and communicate monetary policy. Some recent proposals, for instance, would require the Fed to specify a monetary policy rule that it would follow in adjusting the key policy rate (i.e., the federal funds rate target) and for the Fed to explain any deviations from that rule.

Questions abound about these proposals: Is the idea for the Fed to use only one rule or a suite of rules, each with its own strengths and weaknesses? Among a suite of rules, which ones should receive more emphasis? What does “follow a rule” mean for the Fed, and what are the implications for not doing so? And, what about when the policy rate is near the zero lower bound? Should the Fed be encouraged to follow a rule even if it means that the policy rate would be negative?

These are good questions, but the case in favor of monetary policy rules is also compelling. We cannot really talk coherently about the future evolution of the macroeconomy without also talking about the future evolution of monetary policy. The two subjects go hand-in-hand: A monetary policy rule helps to map out the path of policy consistent with an envisioned path for the macroeconomy.

In light of these considerations, my recommendation is for the Fed to issue a quarterly monetary policy report to better explain its actions and projections on a regular basis. Reports like this are often issued by other central banks around the world. The information in the report could be organized around recommendations from a standard suite of monetary policy rules. This could improve the U.S. monetary policy debate by orienting it more toward a comparison of actual policy to recommendations from standard monetary policy rules.

Many Rules Already Used

In recent decades, monetary policy rules have become standard in the macroeconomics literature. A policy rule, such as the Taylor rule, named after John Taylor of Stanford University, is an equation that provides a recommended setting for a central bank’s targeted interest rate. It is based partly

on values and targets for macroeconomic variables, including inflation as well as output or unemployment. Policy rules are popular among many economists and policymakers—including at the Fed—because these rules, when applied, help provide an understanding about future monetary policy, which is in turn important to households and businesses making investment and consumption decisions.

Much Fed communication, some within the Fed and some directed to the public, already involves using policy rules as benchmarks. As an input for the deliberations at each Federal Open Market Committee (FOMC) meeting, for instance, staff economists produce and distribute a briefing document to the FOMC known as the Tealbook. Publicly-released Tealbooks have included policy rate recommendations from a suite of monetary policy rules.¹ Similarly, there are many examples of public remarks by FOMC participants in which actual policy outcomes are compared with the prescription from a monetary policy rule. That includes remarks by the FOMC chair. For example, Fed Chair Janet Yellen discussed in 2012 (when she was Vice-Chair) what a variant of the original Taylor rule had prescribed for monetary policy at that time.² Another example is from 2010, when then-Fed Chair Ben Bernanke gave a speech that used a Taylor-type rule to argue that monetary policy had not been too accommodative during the period 2002-2006, which coincided with the housing bubble.³

A Solution to the Communication Problem

Monetary policy rules have been and will continue to be useful as guides for conducting monetary policy. A rules-based quarterly monetary policy report could provide a more complete and fulsome discussion of how the FOMC views the current state of the U.S. economy and the Committee’s expectations going forward. Such a report, which I have advocated in the past,⁴ could include a regular discussion of various monetary policy rules and explain why any deviations from those rules seemed appropriate at that time. This type of reporting may provide an improvement over the so-called “dot plot,” which is



released each quarter in the FOMC’s Summary of Economic Projections and shows FOMC participants’ projections for the policy rate over the next few years. The dot plot does not allow the public to infer which policy rule any of the participants are using since individual dots are not connected across the years shown in the chart or to his or her projections for changes in real gross domestic product, unemployment and inflation.

Conclusion

The Fed has made significant strides in increasing the transparency of its actions since the financial crisis and recession of 2007-2009. Still, there is room for improvement, and further transparency regarding the Fed’s use of policy rules in its monetary policymaking is within reach. Because the Fed already uses policy rules in many ways to describe monetary policy and to make a case for a particular policy, the Fed could push its public communications more in that direction. 

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

ENDNOTES

¹ For example, see Tealbook B for the FOMC meeting in December 2010, at www.federalreserve.gov/monetarypolicy/files/FOMC20101214tealbookb20101209.pdf.

² See Yellen, Janet L. “Perspectives on Monetary Policy,” speech on June 6, 2012.

³ See Bernanke, Ben S. “Monetary Policy and the Housing Bubble,” speech on Jan. 3, 2010.

⁴ For example, see my column in the April 2013 issue of *The Regional Economist*, “A Quarterly Monetary Policy Report Would Improve Fed Communications.”

Mixing the Melting Pot: The Impact of Immigration on Labor Markets

By Guillaume Vandenbroucke and Heting Zhu



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Immigration to the United States is at the center of many debates. The issue is not new, not only in the U.S. but in many other parts of the world, as evidenced in the many discussions in the media, as well as in political and academic circles. For this paper, we looked at U.S. data across states to assess the connection between immigration and labor market outcomes. We were prompted by the argument that immigrants make life harder for workers who already are U.S. citizens. Specifically, we investigated the correlation between immigration and the unemployment rate and between immigration and wages.

We used state-level data from the U.S. Census Bureau for the years 2000, 2005 and 2010 for wages and immigration figures. Immigrants are defined as those who are foreign-born.¹ For wages, we used inflation-adjusted pretax wages and salary incomes of the employed population between the ages of 18 and 60. Finally, we used the Bureau of Labor Statistics' seasonally adjusted unemployment rate.

Immigration and Unemployment

Does a change in immigration affect the unemployment rate? An answer to this question can be found in Figure 1, Panel A. It shows how changes in the proportion of foreign-born are associated with changes in the rate of unemployment from 2000 to 2005. Each point represents a state. This panel assesses whether states with changes in their proportion of foreign-born tend to see systematic change in their rate of unemployment.

A closer look at three states may help explain the panel. Take Alaska first. Between 2000 and 2005, the proportion of foreign-born among the total population

decreased from 7.5 to 6.7 percent, a difference of -0.8 percentage point (measured on the horizontal axis). During the same period, the rate of unemployment rose from 6.4 to 6.9 percent of the labor force, a difference of 0.5 percentage point (measured on the vertical axis). Turn now to Arizona and Washington state. Like Alaska, they too experienced an increase in their unemployment rate of about 0.5 percentage point. But, unlike Alaska, the proportion of immigrants in these states increased, by 0.6 percentage point for Arizona and by 2.1 percentage points for Washington.

Considering these three states only, similar changes in labor market conditions—namely an increase in the rate of unemployment—are associated with very different changes in the proportion of immigrants. This suggests a weak correlation between the two variables. The remaining states plotted on Panel A of Figure 1 convey the same message.

Had there been a strong relationship between the foreign-born proportion and the unemployment rate, this panel would have displayed it via a clear alignment of points along a line or a curve, and we would have concluded that the correlation between the variables was close to 100 percent. Instead, analyzing the data in Panel A of Figure 1 reveals a correlation that is less than 0.1 percent. There appears to be no statistical link between unemployment and immigration.²

Does this result depend upon the period under consideration? Panel B of Figure 1 shows the relationship between unemployment and immigration between 2005 and 2010. Note that unemployment rates increased much more in all the states than

they did during the 2000-2005 period. This is the effect of the Great Recession, which started in 2007 and ended in 2009. Like Panel A, Panel B of Figure 1 reveals that the relationship between unemployment and immigration is weak to nonexistent, even during this crisis period.

Immigration and Wages

If immigration does not affect employment opportunities, maybe it matters for the wage rate. Again, we turn to state-level census data to examine whether a state with an increasing proportion of those who are foreign-born has systematically experienced higher or lower wages over time.

Panel A of Figure 2 presents the relationship between wages and immigration between 2000 and 2005. Like Panel A of Figure 1, this panel reveals a weak to nonexistent correlation. Specifically, changes in the level of wages are very similar across states (i.e., they line up along a horizontal line) even though changes in the proportion of foreign-born people vary a lot.

Panel B of Figure 2 shows, as Panel B of Figure 1 did for unemployment, that the correlation between wages and immigration remains nonexistent during the crisis period.

Immigration and Low-Skilled Workers

Figures 1 and 2 show that there is no connection between immigration and the labor market outcomes (unemployment risk and wage) of the average worker. But what about more narrowly defined groups of workers? Is it possible, for example, that an influx of low-skilled immigrants mostly affects the labor market outcomes of low-skilled native workers?

A study by economist David Card addresses this question. It discusses the

FIGURE 1

The Relationship between Unemployment and Immigration

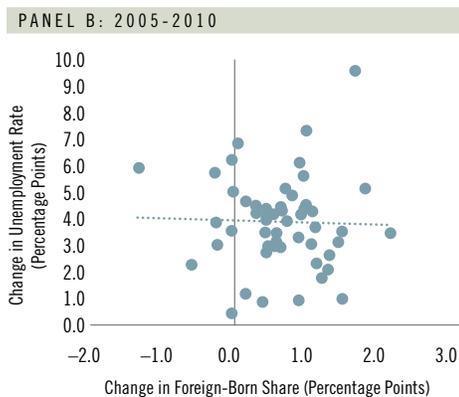
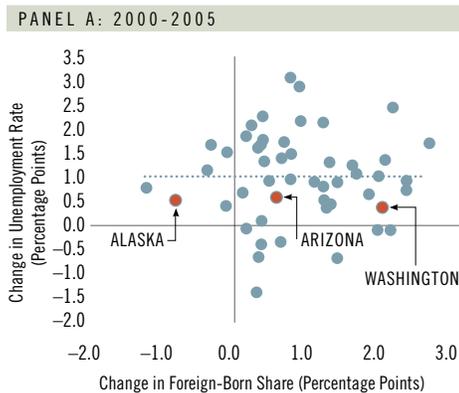
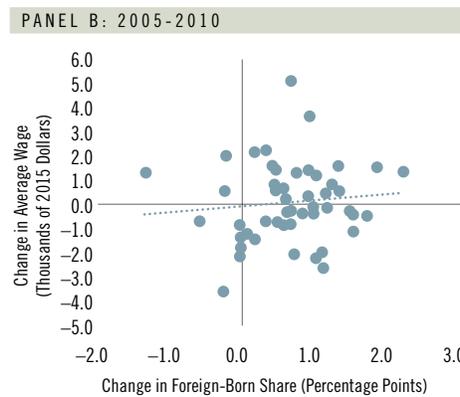
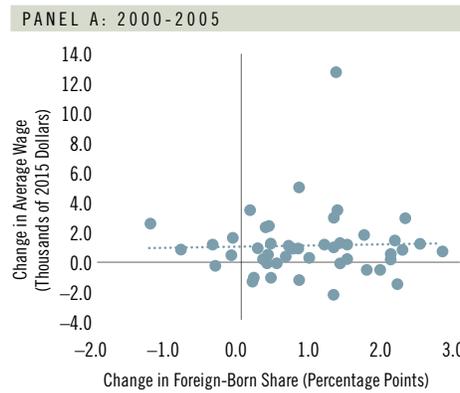


FIGURE 2

The Relationship between Wages and Immigration



SOURCES: Authors' calculations from American Community Survey accessed via IPUMS-USA, Haver Analytics and Bureau of Labor Statistics.

consequences of the Mariel boatlift episode, when about 125,000 Cubans emigrated from Cuba's Mariel port to Miami between May and September 1980. These immigrants had relatively low skills (i.e., less than the average Cuban worker). Card found no evidence that low-skilled wages and the unemployment rate among low-skilled workers changed in Miami.

Conclusion

There have been many studies of the economic consequences of immigration, and they do not all agree. Findings are sometimes specific to the experiment at hand, as in the Mariel boatlift case, where it could be argued that the Miami labor market is not representative of the U.S. as a whole.

Yet, it remains that many studies find little to no evidence of a connection between immigration and labor market outcomes.³ Since this may be more surprising, on the surface, than the opposite result, it deserves

some explanations. One possible explanation is that some immigrants may have overall positive effects on the economy. This would be especially true of high-skilled immigrants who contribute ideas and innovations that drive productivity higher. Another explanation is that, even in the same skill group, immigrants and native workers may not be perfect substitutes. It was suggested in one study that immigrants do not so much compete directly with natives as they create conditions for increased specialization by which natives perform more communication-intensive work and immigrants do manual tasks.⁴ 

Guillaume Vandembroucke is an economist, and Heting Zhu is a research associate, both at the Federal Reserve Bank of St. Louis. For more on Vandembroucke's work, see <https://research.stlouisfed.org/econ/vandembroucke>.

ENDNOTES

- ¹ When surveyed for the census, respondents are expected to reveal the birthplace of each of the members in their households, specifying the state or country of origin.
- ² The dotted line in the figure represents, graphically, the statistical relationship between the variables measured on the vertical and horizontal axes. The fact that this line is flat is another way to express the lack of correlation between the variables.
- ³ See Basso and Peri.
- ⁴ *Ibid.*, p. 15.

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The Recovery Act of 2009 vs. FDR's New Deal: Which Was Bigger?

By Bill Dupor



The American Recovery and Reinvestment Act of 2009 has been called the federal government's largest economic recovery plan ever. But was it really?

The Recovery Act was one of the first pieces of legislation passed during the presidency of Barack Obama.¹ Besides being a massive stimulus program on the heels of the Great Recession (2007-09), the act provided fodder for the debate on when and how the government should intervene in the economy.

However, a lot has happened in the U.S. between the 1930s and the 2000s besides inflation that might lead one to make other adjustments to the numbers. For one thing, the U.S. population more than doubled.

After all was said and done, the Recovery Act's total cost was \$840 billion. Michael Grabell, an author of a history of the act, called it "the biggest economic recovery plan in history." Similar statements have been made in several media outlets.² My focus will be on whether or not the act really holds this title. I will do this by comparing it to another massive fiscal stimulus in U.S. history, President Franklin D. Roosevelt's New Deal.

Multiple Ways to Compare

The New Deal began in 1933, when the federal government introduced an "alphabet soup" of programs meant to give economic relief during the Great Depression. For

example, the Works Progress Administration (WPA) was created as a federal agency that hired millions of unemployed workers to carry out civil projects, such as constructing public buildings and roads. The Agricultural Adjustment Administration (AAA) oversaw the reduction in farm production by paying farmers to leave parts of their croplands fallow and to kill off a fraction of their livestock.

According to a 2015 study by economists Price Fishback and Valentina Kachanovskaya, total federal spending on New Deal programs was \$41.7 billion at that time. Translated into dollars at the time of the Recovery Act's passage, New Deal spending equaled \$653 billion. Without any other adjustment, one would conclude that the Recovery Act was the more expensive of the two stimulus programs, which also would make it the most expensive in U.S. history.

However, a lot has happened in the U.S. between the 1930s and the 2000s besides inflation that might lead one to make other adjustments to the numbers. For one thing, the U.S. population more than doubled. On a per capita basis in 2009-adjusted dollars, the Recovery Act cost \$2,738, while the New Deal programs cost \$5,231. Accordingly, one could reach the conclusion that the Recovery Act cost less than the New Deal but that the two were of a similar order of magnitude.

Let's not stop there. Even after accounting for population growth and inflation, the U.S. economy has grown because of productivity. With this in mind, one could compare the two stimulus programs in terms of the size of the economy when each was enacted. By this measure, the cost of the Recovery Act was equal to 5.7 percent of the nation's 2008 output. On the other hand, the

Recovery Act vs. New Deal

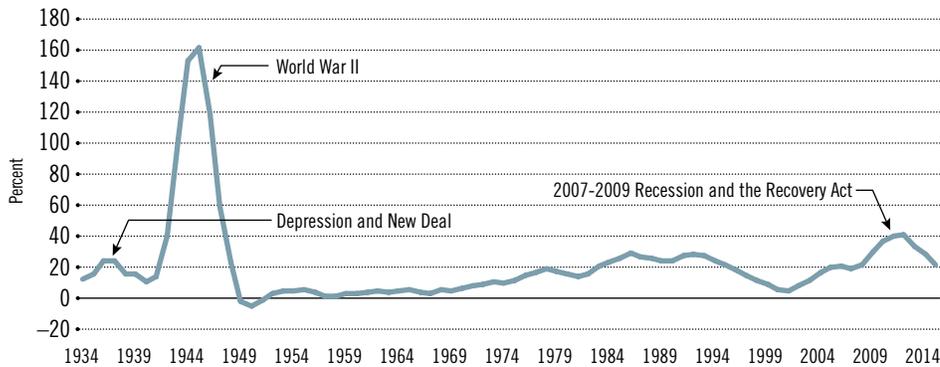
Recovery Act	New Deal
Total cost in 2009 dollars	
\$840 billion	\$653 billion
Per capita cost in 2009 dollars	
\$2,738	\$5,231
Cost compared to nation's output	
5.7 percent of 2008 output	40 percent of 1929 output
Increase in federal debt*	
32 percent 2008 to 2011	30.3 percent 1931 to 1939

*As a fraction of gross national product

cost of the New Deal, based on the Fishback-Kachanovskaya numbers, was 40 percent of the nation's 1929 output. A key reason that the New Deal programs cost substantially more than the Recovery Act is that the former continued for a longer time. Most of the Recovery Act spending took place over three years, but the New Deal spending stretched over seven years, Fishback and Kachanovskaya reported.

Of course, factors besides these programs affected fiscal policy during each of the two time periods. First, the tax liabilities of households and businesses changed because their incomes were falling. Second, other transfer programs (such as unemployment

Four-Year Change in the Federal Debt, Scaled by Lagged GNP



NOTE: The chart reports, for a particular year (t), the change in the total federal debt from that year minus total federal debt for the year four years earlier (t-4) scaled by gross national product in year t-4.

SOURCES: Bureau of Economic Analysis, U.S. Department of the Treasury and the author's calculations.

insurance and food stamps), particularly during the Recovery Act period, were at work putting resources into the economy. These are known as “automatic stabilizers.” There were other programs during the Recovery Act period, such as the Education Jobs Fund and the Car Allowance Rebate System program (CARS, also known as Cash for Clunkers).

As a Share of GNP

One more broad way to measure the relative size of the two fiscal stimuli is to compare their effect on the federal debt as a fraction of gross national product (GNP). A larger increase in the debt may be interpreted as greater fiscal easing. The cost of programs such as CARS is reflected by an increase in the federal debt.

To get at this measure, I first calculated the increase in the federal debt between 1931 and 1939 as a fraction of GNP in 1931. This equaled 30.3 percent. Then, I calculated the increase in the federal debt between 2008 and 2011 as a fraction of GNP in 2008. This equaled 32 percent. By this broader measure, the two interventions were of a relatively similar size, with the response to the 2007-09 recession being slightly larger. The chart shows the four-year change in the federal debt scaled by GNP across time.

Beyond Fiscal Stimuli

Finally, there are aspects of countercyclical government intervention that sometimes go beyond traditional fiscal (or monetary)

Finally, there are aspects of countercyclical government intervention that sometimes go beyond traditional fiscal (or monetary) policy. These can be difficult to measure with a particular dollar value.

policy. These can be difficult to measure with a particular dollar value. The New Deal famously introduced industrial and labor policies that influenced the operation of the private sector, even though the policies did not increase government purchases or change taxes.³ For example, the National Industrial Recovery Act authorized the regulation of industry by the president as a potential way to stimulate the economy by raising prices. Also, the Wagner Act established the National Labor Relations Board, which increased the power of labor unions. In contrast, the Recovery Act consisted almost entirely of tax relief, transfers and government spending and did not venture into industrial and labor policy areas. 

Bill Dupor is an economist at the Federal Reserve Bank of St. Louis. For more on his work, see <https://research.stlouisfed.org/econ/dupor>. Research assistance was provided by Rodrigo Guerrero, a research associate at the Bank.

ENDNOTES

- 1 A substantial amount of research has been done on the short-term economic impact of the act. For example, Conley and Dupor (2013) and Dupor and Mehkari (2016) examined the act's job-market effects. Dupor and Li (2015), in part, studied the effects of the Recovery Act on inflation. Dupor and McCrory (2017) examined the extent to which Recovery Act spending spilled over across geographic regions.
- 2 See, for example, Bennett and Weise, Chapman and Klein.
- 3 See, for example, Cole and Ohanian.

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Financial Conditions

Do the Ups and Downs Affect the Rest of the Economy?

By Hee Sung Kim and Juan M. Sánchez

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This article discusses two related questions. First, how can we measure financial conditions? To answer this question, we present information about our preferred measure of financial conditions: financial conditions indexes. We discuss how they are constructed and show their recent evolution.

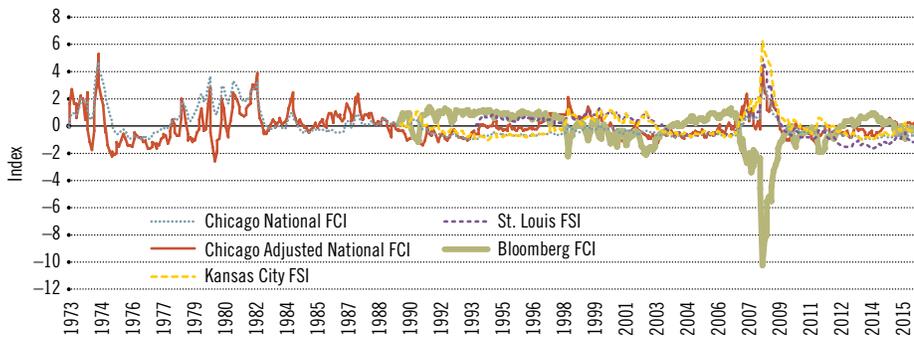
Once we explain how financial conditions can be summarized in an index, we move to our main question: How do financial conditions affect real activity? This question is more challenging because improvements in financial indicators often reflect improvements in the rest of the economy. But just because the former reflects the latter doesn't mean that the improvements in financial indicators *cause* improvements in the rest of the economy; rather, this may be just a correlation.

Thus, we first explain how economists have evaluated the effect of financial conditions and real activity, such as sales and investments.¹

The idea, which was used to understand how the level of the financial development of a country affects that country's output per capita, relies on comparing the performance of economic sectors (e.g., textiles and machinery) with different dependence on external financing.

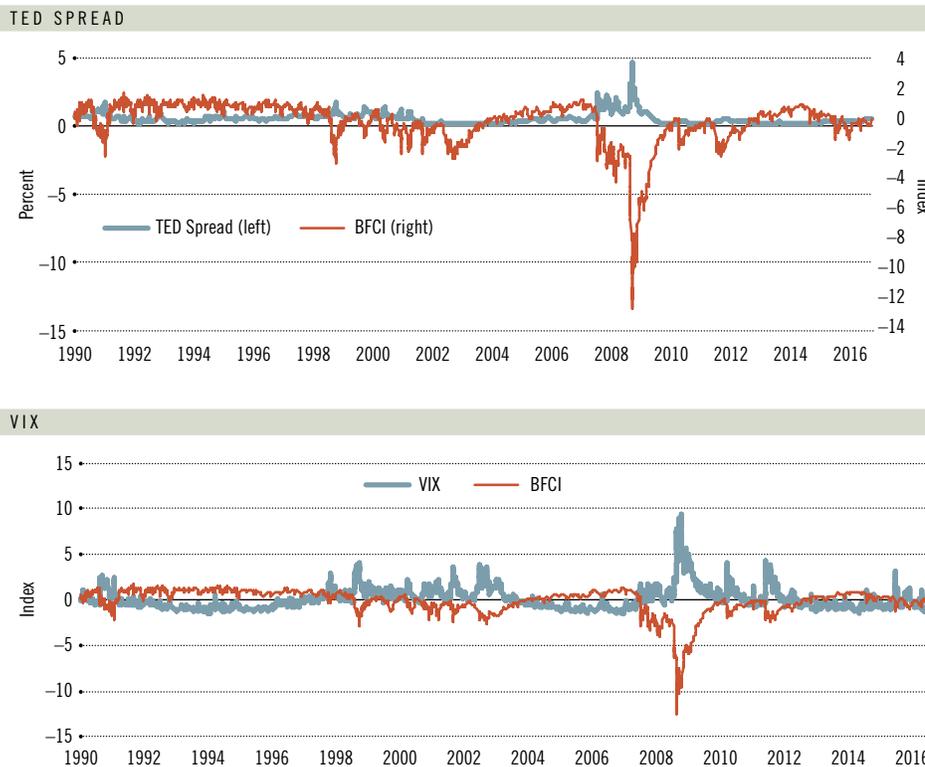
To answer the second question, this article applies that idea to changes in financial conditions in the U.S. over time. Before presenting our answer to that question, we describe how different sectors depend on external financing for investment, which, as mentioned above, will be the key to identifying how financial conditions affect the rest of the economy.

FIGURE 1
Financial Conditions Indexes



SOURCES: Federal Reserve banks of Chicago, Kansas City and St. Louis, and Bloomberg.
NOTE: FCI stands for financial conditions index, and FSI for financial stress index.

FIGURE 2
Selected Components of Financial Conditions Indexes



SOURCES: Federal Reserve Economic Data (FRED) and Bloomberg.

NOTE: The TED spread is the difference between 90-day LIBOR (interest rates on interbank loans) and 90-day T-bills. VIX refers to the Chicago Board Options Exchange Volatility Index, which measures the market's expectation of 30-day volatility, using implied volatilities of S&P 500 Index options. BFCI is the financial conditions index of Bloomberg.

Last, we present the results, which suggest that changes in financial conditions in the U.S. matter for the level of economic activity, but the effect is moderate.

Financial Conditions

Measuring financial conditions in an economy requires careful examination

of different financial indicators, such as bond spreads and equity markets volatility. Financial conditions indexes are the preferred method to summarize the state of financial markets. These indexes collect a variety of financial variables that help characterize the state of financial markets. Similarly, financial stress indexes monitor

financial instability by looking at data series that indicate increased likelihood of a crisis. The former tend to encompass a larger universe of financial variables than do the latter. However, since the difference between them is relatively small,² we will not make any distinction between them and will refer to them both as financial conditions indexes throughout the article.

In Figure 1, we have plotted indexes constructed by the Federal Reserve banks of St. Louis, Chicago³ and Kansas City, as well as by Bloomberg. The index from the Chicago Fed has data going back the furthest, 1973, followed by indexes from Bloomberg and the Kansas City Fed, both dating back to 1990, and the index from the St. Louis Fed, which began in 1994. With the exception of Bloomberg's, a higher value implies tighter financial conditions, while a lower value indicates better financial conditions. The opposite is true for Bloomberg—lower values imply bad (tighter) financial conditions, and higher values imply good (accommodative) financial conditions.

Although the indexes are designed to capture the same concept—the state of financial markets—there are several differences, mostly because the indexes consider different financial indicators. For instance, Chicago's breaks down the financial conditions into three subcategories—risk, credit and leverage—and collects the financial instruments that help explain these categories, while Bloomberg's decomposes the financial conditions into U.S. money spread, U.S. bond market and U.S. equity market. Despite the differences, the indexes are highly correlated with one another.⁴ In what follows, we used Bloomberg's index to discuss the financial conditions because the data frequency is the highest (daily updates) and the data period coincides with the data from Compustat, from which we obtained other variables required to evaluate the effect of financial conditions on nonfinancial companies.

Although there are many subcomponents of these indexes, we chose as examples two financial indicators that are included in the construction of most indexes and plotted them against the Bloomberg index. (See Figure 2.) The TED spread is the difference between the interest rates on interbank loans and on short-term U.S. government debt (Treasury bills, or T-bills). This spread,

TABLE 1

Best and Worst Financial Times by Bloomberg Financial Conditions Index, from 1990 to 2015

Good Financial Time (Quarterly)	Bad Financial Time (Quarterly)
1991 Q1	2008 Q4
1992 Q2	2009 Q1
1994 Q3	2009 Q2
2007 Q1	2008 Q3
1994 Q2	2008 Q1

SOURCE: Authors' calculations based on Bloomberg data.

which is used in all the aforementioned indexes, increases in bad financial conditions. The VIX, the volatility index of the Chicago Board Options Exchange, is also widely used in these indexes; it measures the implied volatility of S&P 500 index options, representing one measure of the market's expectation of stock market volatility over the next month. Other variables usually included are the commercial paper/T-bill spread and the spread between corporate Baa bonds and 10-year Treasuries, which are included in all of these indexes except Kansas City's.

How do these indexes help us study the effect of financial conditions on economic activity? The indexes identify periods of good and bad financial conditions; we then look at the performance of companies in terms of sales and investments during those good and bad periods. Table 1 lists the top five quarters for best financial conditions and worst financial conditions from 1990 to 2015 according to one of the indexes, Bloomberg's index. (We started our analysis at 1990 because of availability of Compustat data.) The early 1990s had the best financial conditions, while the 2007-09 financial crisis was by far the period of the worst financial conditions in recent history.

From Financial Conditions to Real Activity

As mentioned above, one of the main problems in trying to capture the effect of financial conditions on real activity (investments, sales, etc.) is reverse causality. In particular, when firms' investments and sales are high, financial variables, such as the S&P 500, may look good just as a reflection of economic activity. Thus, an observer

TABLE 2

Financial Dependence by Sectors

Lowest	Highest
Apparel, Piece Goods, and Notions	In Vitro and In Vivo Diagnostic Substances
Tobacco Products	Office Machines Not Elsewhere Classified
Service to Dwellings and Other Buildings	Commercial Physical and Biological Research
Jewelry Stores	Greeting Cards
Hardware, Plumbing and Heating Equipment	Electromedical and Electrotherapeutic Apparatus
Computer and Computer Peripheral Equipment and Software	Jewelry, Silverware and Plated Ware
Credit Reporting Services	Miscellaneous Services
Rubber and Plastics Footwear	Eating and Drinking Places
Men's and Boys' Furnishings, Work Clothing, and Allied Garments	Plastics, Foil, and Coated Paper Bags
Motor Vehicle Supplies and New Parts	Mining Machinery and Equipment, except Oil and Gas Field Machinery and Equipment
Legal Services	Engines and Turbines
Nursing and Personal Care Facilities	Food Stores
Miscellaneous Furniture and Fixtures	Telegraph and Other Message Communications
Electronic and Other Electrical Equipment and Components, except Computer Equipment	Amusement and Recreation Services
Help Supply Services	X-ray Apparatus, Tubes and Related Irradiation Apparatus

SOURCE: Standard & Poor's Compustat annual data.

will detect a positive correlation between financial conditions and real activity and may infer that financial conditions cause better real activity. In that case, however, better financial conditions would be due to the effect of real activity on financial conditions, and not the opposite.

Exactly the same problem was faced by economists when they studied the effect of financial development for economic development across countries. Are rich countries richer because they have a better financial system? Or is the better financial system a consequence of the countries' development?

Looking at cross-country data, economists Raghuram Rajan and Luigi Zingales had the idea that if the level of financial development of a country really affects economic activity in that country, it has to be that growth in the country with better financial conditions should be particularly high in the industries that rely more on external financing for investment. In the rest of this article, we apply that idea, but instead of comparing different countries, we compare the U.S. economy in times of good and bad financial conditions. If financial conditions really cause fluctuations in real activity, we should see that when financial conditions deteriorate, the most affected

companies are those in the most financially dependent sectors.

Financial Dependence

Are all industries/sectors affected by financial conditions in an equal magnitude? Undoubtedly, all firms may encounter some degree of financial stress during financial bad times, especially during times like the 2007-09 recession. However, some industries suffer more because they depend more on external financing for investment than do other industries. We computed an indicator of financial dependence, Rajan and Zingales' methodology, for companies in Compustat and aggregated that information at the level of the sector. The indicator is the ratio of capital expenditures minus cash flow from operations to capital expenditures. It reveals the desired investment that cannot be financed through internal cash flow generated by the median company in the sector.⁵ Thus, sectors with a higher ratio of external financing for their investments are more dependent on the financial conditions of the economy.

In particular, we constructed the Rajan-Zingales index by first calculating the index for individual companies for all years from 1990 to 2015 in Compustat. We then computed the median value of the Rajan-Zingales

TABLE 3

Growth of Sales and Investment by Financial Condition and Dependence on External Financing, 1990-2015

	Financial Dependence	
	Low	High
Overall		
Growth of Sales	8.10%	8.96%
Growth of Investment	5.85%	5.62%
Good Financial Time		
Growth of Sales	12.81%	14.17%
Growth of Investment	18.90%	20.64%
Bad Financial Time		
Growth of Sales	2.16%	1.42%
Growth of Investment	-10.86%	-14.89%

SOURCES: Standard & Poor's Compustat annual data and Bloomberg.

index across all companies within the same sector to find each sector's dependency on external financing. We used the median value to represent the financial dependence of the sector because there are some firms with extreme values in the index; these outliers would have distorted the data if we had used the mean value. For an analogous purpose, we used the median value of the index across all years. Thus, we ended up with one value of the Rajan-Zingales index for each sector in Compustat.

Table 2 lists the sectors with the highest and the lowest dependence on external financing. Apparel and tobacco emerge as the industries with the lowest dependence on external finance, while drugs and machinery top the list of those with the highest financial dependence. These rankings should be of no surprise because the apparel and tobacco industries have high cash flow, reducing the need for external finance; at the other extreme, the drug, or pharmaceutical, industry has high negative cash flow from operations, with a large need to use external financing to achieve desired investment. Machines and research follow very closely behind drugs in their financial dependence. These results resemble the findings by Rajan and Zingales.

Real Economic Activity

Now that we have discussed measures of financial conditions and measures of dependence on external financing, we only

need measures of real activity to be able to evaluate whether sectors that are more dependent on external financing perform worse in bad financial conditions than the other sectors, and vice versa. We have recorded the growth in sales and investment for each sector, and we have classified sectors into low and high financially dependent industries (bottom 50 percent and top 50 percent). Table 3 summarizes our analysis of the growth throughout the sample period of 1990-2015, during good financial times and during bad financial times, defined by the periods with the 10 percent highest and lowest of the Bloomberg financial conditions index.

Here we observe that, over the entire time period (good and bad), growth of sales for sectors that have low dependency on external financing is 8.10 percent, while growth of investment for these sectors is 5.85 percent. Similar numbers are obtained for the entire time period for the sectors that have a high dependency on external financing: Sales growth is 8.96 percent, and investment growth is 5.62 percent.

However, when we look at good financial times, we see a clear difference in the growth of both variables among the two categories of sectors. The growth of sales during good financial times is 12.81 percent for companies in sectors with low dependence on external financing and 14.17 percent for companies in sectors with high dependence. Similarly, investment growth during good financial conditions is 18.90 percent for companies in sectors with low dependence and 20.64 percent for companies in sectors with high dependence.

Similarly, when we look at bad financial times, we see a significant decrease in the growth of all companies, but sectors with high dependence on outside financing fared worse during the bad financial times. In particular, the growth of sales decreased from 2.16 percent to 1.42 percent, and the growth of investment decreased from -10.86 percent to -14.89 percent. We can also see that the growth of investment reacts with more volatility to the change in financial conditions than the growth of sales does, as would be expected.

Overall, the results in Table 3 show that

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ENDNOTES

- Throughout the article, real economic activity will be measured using information on sales and investment of publicly traded companies.
- See Kliesen et al.
- The Federal Reserve Bank of Chicago has two indexes: national and adjusted national. The adjusted one isolates a component of financial conditions uncorrelated with economic conditions to provide an update on financial conditions relative to current economic conditions, since U.S. economic and financial conditions tend to be highly correlated.
- See Hatzius et al. for a detailed comparison of different indexes.
- See Rajan and Zingales.

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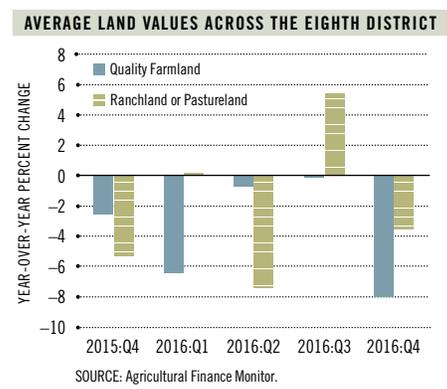
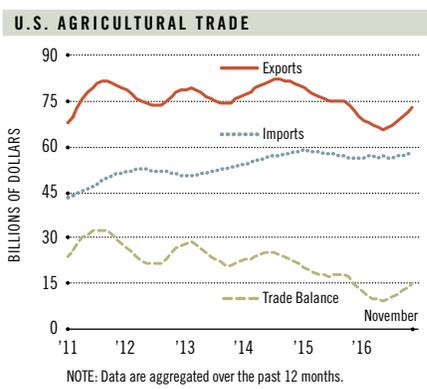
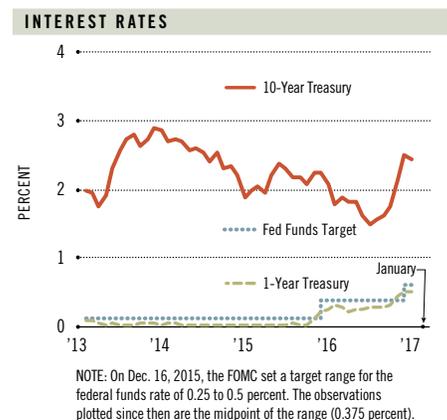
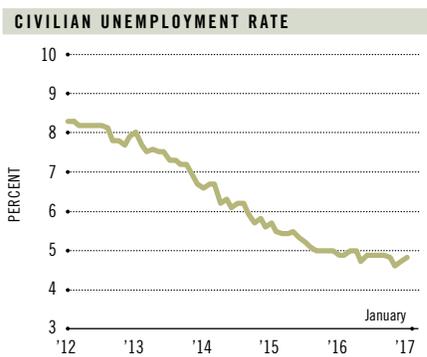
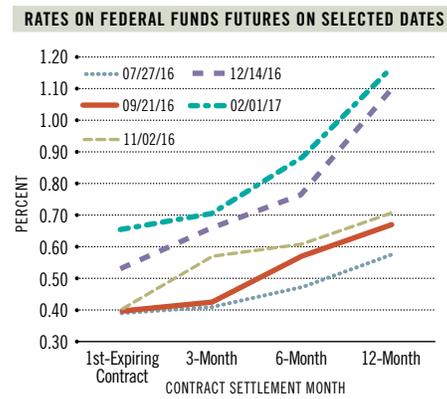
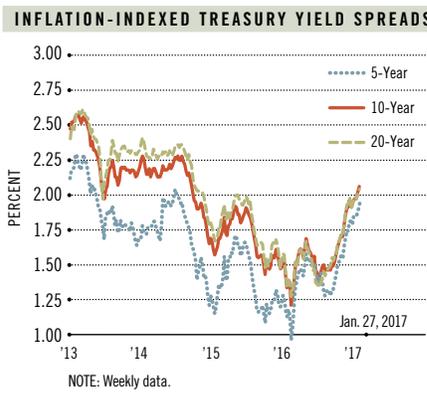
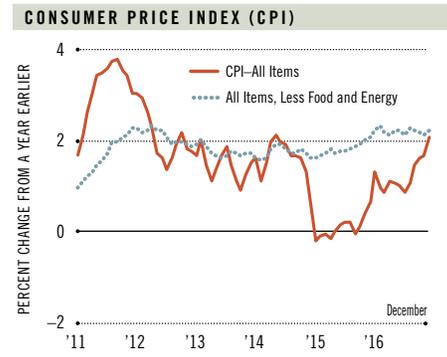
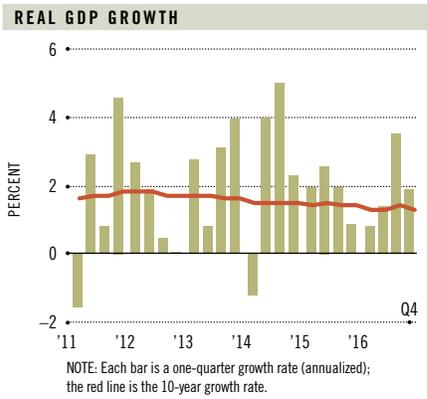
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the sales and investments of companies in more financially dependent sectors react more to the financial conditions indexes than of companies in less financially dependent sectors. These results confirm that there is, indeed, an effect from financial conditions to real activity. The size of the effect, however, is moderate. The difference in the growth of investment between good and bad financial times is about 30 percentage points (18.9%–(–10.9%)) for companies in the least financially dependent sectors and of 35 percentage points (20.6%–(–14.9%)) in the most financially dependent sectors. Therefore, the difference for investment between sectors with different financial dependence across the best and worst financial conditions is only about 5 percentage points. For sales, the difference is about 2 percentage points.

Conclusion

This article shows that financial conditions, measured by financial conditions indexes, affect real activity, but the effect is moderate. In particular, we show that industries that depend more heavily on external financing for investment are affected more, in terms of investment and sales, by bad financial conditions than are industries that rely less on external financing. Given data limitations, our findings correspond only to publicly traded firms, with better access to financial markets. One may expect that smaller firms, with less access to credit, may be even more affected by financial conditions. However, recent work by economists Marianna Kudlyak and Juan Sánchez suggests that during the 2008 financial crisis large firms were affected more than small firms. 

Juan M. Sánchez is an economist, and Hee Sung Kim is a research associate, both at the Federal Reserve Bank of St. Louis. For more on Sánchez's work, see <https://research.stlouisfed.org/econ/sanchez>.



On the web version of this issue, 11 more charts are available, with much of those charts' data specific to the Eighth District. Among the areas they cover are agriculture, commercial banking, housing permits, income and jobs. To see those charts, go to www.stlouisfed.org/economyataglance.

Signals Are Mixed, but Optimism Is on the Rise

By Kevin L. Kliesen

The U.S. economy ended 2016 on a soft note, based on the advance estimate for real gross domestic product (GDP) growth for the fourth quarter. Still, economic conditions last year were broadly similar to those seen during this business expansion: modest growth, low inflation and mostly healthy labor market conditions. The majority of forecasters expect more of the same this year, although optimism appears much brighter in financial markets and among consumers and businesses.

A Recap of 2016

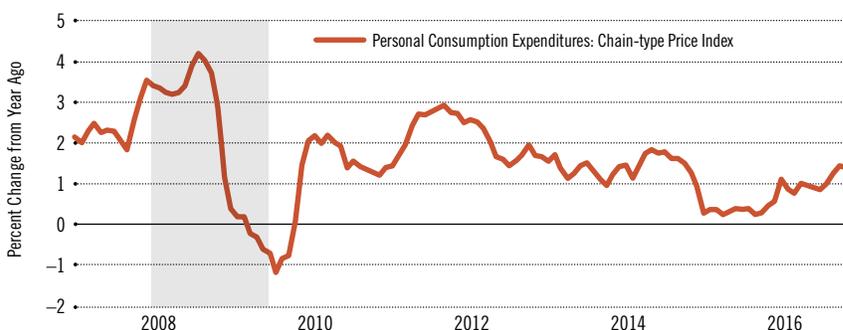
After registering a 3.5 percent annualized rate of growth in the third quarter, the pace of U.S. economic activity slowed to a 1.9 percent rate over the final three months of the year. Nevertheless, real GDP growth was measurably stronger over the second half of 2016 than it was over the first half of the year. Overall, U.S. real GDP increased by 1.9 percent in 2016. This increase matched 2015's pace and was only slightly less than the average growth rate of 2.1 percent for this business expansion, which started in June 2009.

Although top-line real GDP growth in 2016 was unchanged from a year earlier, the composition of growth changed in several key dimensions. First, the growth of real consumer spending was modestly stronger, particularly for durable goods like motor vehicles, as was the growth of real exports of goods and services. Second, real business fixed investment, real residential fixed investment and government expenditures all grew at a slower pace in 2016 compared with 2015.

Inflation edged higher in 2016 because of a rebound in crude oil prices, which lifted gasoline and diesel prices. Last year's inflation rate—December to December, as measured by the price index for personal consumption expenditures—was 1.6 percent, one percentage point more than 2015's rate. Inflation remained below the Federal Open Market Committee's inflation target of 2 percent for the fifth consecutive year. By comparison, the all-items consumer price index increased by 2.1 percent last year, 1.4 percentage points

Inflation Rate

As Measured by the Price Index for Personal Consumption Expenditures



SOURCE: U.S. Bureau of Economic Analysis.

NOTE: Gray shading indicates recession.

more than the previous year. Long-term inflation expectations ended the year slightly above 2 percent.

Labor market conditions remained solid in 2016. Monthly job gains averaged about 187,000, markedly slower than the 226,000 per-month job gains registered in 2015 but still well above the underlying growth of the labor force. Accordingly, the unemployment rate fell from an average of 5.3 percent in 2015 to 4.8 percent in 2016—its lowest rate since 2007. Real labor compensation (wages and salaries plus supplements, like employer-provided health insurance) paid to domestic employees increased by 2.3 percent in 2016, about half the pace seen in 2015.

The Outlook for 2017

As forecasters peer into their crystal ball, the unknowns seem more pronounced this year than usual for several reasons.

First, the new administration has promised a marked change in the direction of economic policies. Some of these proposals—such as cuts in the corporate tax rate, increased expenditures on defense and infrastructure, and regulatory relief—should have positive effects on the economy. However, other proposals, such as those that could impinge on international trade in goods and services, would tend to raise domestic prices, weaken the benefits of competition and slow economic growth. Despite this uncertainty, consumer and business confidence has soared since the presidential election, helping to push stock prices to record highs.

Expectations of faster growth, and perhaps the risk of higher inflation, have also driven long-term interest rates higher and boosted the value of the U.S. dollar.

Second, most of the world's major oil producers have agreed to cut production in an effort to raise the world price of oil. If successful, higher oil prices will benefit domestic oil producers and, thus, help to raise real GDP growth via increased investment in oil and mining exploration. Indeed, falling oil prices have been a drag on business investment for much of the past three years. However, higher energy costs will also raise the cost of production for energy-using industries, like airlines and trucking. Of course, consumers will also pay more at the pump for gasoline, which will increase inflation (if only temporarily).

Third, most Federal Reserve policymakers have signaled that they are likely to continue raising the federal funds interest rate target in 2017. Any unexpected changes in monetary policy—whether tighter or more accommodative—will naturally influence expectations of future growth, inflation and financial market asset prices.

Coping with economic uncertainty is an ongoing challenge for economists and forecasters. But this challenge becomes more difficult when key inputs in the forecasting process have a larger degree of uncertainty. Until the direction of monetary and fiscal policies becomes better known, they are but one more unknown upon a layer of other unknowns. This, as much as anything, explains why the majority of forecasters expect economic conditions in 2017 to look much like 2016's. [Ω](#)

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Slowdown in Productivity: State vs. National Trend

By YiLi Chien and Paul Morris



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Slow growth in labor productivity is one of the major challenges facing the U.S. economy. Not surprising, then, is the level of attention being drawn to the problem.¹ However, there is no consensus on the slowdown's cause, with multiple contributing factors being likely.

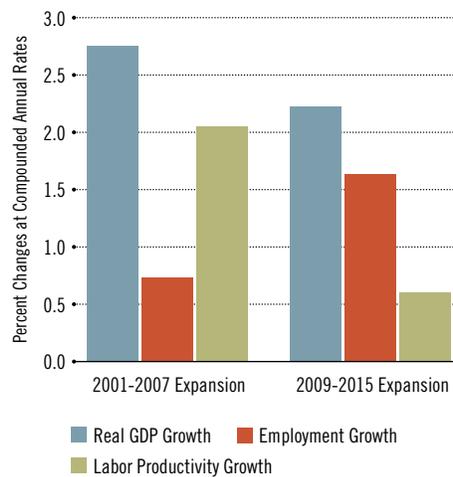
This article takes a step to investigate the issue by looking at the labor productivity growth rate at the state and regional levels. More specifically, we explore the trends in state and regional labor productivity growth over the current and previous expansions to see how growth has varied both geographically and over time.² The aim is to see whether the labor productivity slowdown observed in the national data occurred homogeneously across states or if some states played a larger role than others.

Background

The average growth rate for gross domestic product (GDP) in the nonfarm business sector³ since the end of the financial crisis in 2009 has been slow, an annual rate of only 2.2 percent. In the previous expansion, which ran from 2001 to 2007, the economy grew at an annual rate of 2.8 percent. The driving forces of growth during these two expansions—labor inputs and production efficiency—have played markedly different roles.

Figure 1 shows real GDP growth decomposed into employment growth and labor productivity growth, measured here as growth in output per employee.⁴ Over the 2001-2007 expansion, growth in labor productivity was the key driver of economic growth; it grew 2.1 percent annually and accounted for nearly 75 percent of real GDP growth. Over the current expansion, growth

FIGURE 1
Accounting for Real GDP Growth during the Current and Previous Expansions



SOURCES: Bureau of Economic Analysis (BEA), Bureau of Labor Statistics (BLS) and authors' calculations.

NOTE: The driving forces of growth over these two expansions—labor inputs (employment growth) and labor productivity growth (production efficiency)—have played very different roles during these two periods. Growth in labor productivity is particularly important to improvements in the standard of living.

in labor productivity has been very low, only 0.6 percent annually, accounting for just 26 percent of real GDP growth.

The weak labor productivity growth is a much deeper concern than even the lower aggregate economic growth rate: Labor productivity growth is the key factor that increases per capita standard of living since it measures the average growth rate of the amount of goods and services that each individual can consume.

More importantly, a small difference in labor productivity growth leads to a dramatic difference in the standard of

living in the long run. For example, if the labor productivity growth rate held steady at 2.1 percent—the rate seen in the previous expansion—the living standard would double in only 33 years. If labor productivity continues to grow at 0.6 percent—the rate of growth in the current expansion—the living standard would improve by just 22 percent over the same 33 years.

Growth over Geography and Time

A comparison of the state-level labor productivity growth between the current and previous expansions shows that the slowdown has been experienced by most states and, hence, is a nationwide phenomenon. Figure 2 provides the supporting evidence. It plots the differential between average labor productivity growth in the current and previous expansion periods for each state. The horizontal line in Figure 2 is the labor productivity growth differential for the nation, coming in at -1.5 percentage points.

Turning to the states, only two, North Dakota and West Virginia, saw labor productivity grow faster over 2009-2015 than 2001-2007. A significant oil boom began in North Dakota in the mid-2000s, bringing a large influx of capital; West Virginia saw only a marginal increase.

Over the current expansion, a total of 13 states experienced negative growth, averaging -0.5 percentage points. In the previous expansion, 23 states averaged labor productivity growth at or above 2 percent, and no state averaged negative growth.

For some states, the housing crisis may be a major contributor to their slowdown in productivity growth. States that experienced a large housing boom during the previous

expansion have seen a bigger decrease in labor productivity than the national average. For example, California, Nevada, Arizona and Florida each had more than a 2 percentage point differential in labor productivity growth between the two expansions. Some states in New England also had a significant housing bubble along with higher than average productivity reductions; these states included Connecticut, Massachusetts, New Hampshire and Maine. It is, thus, not surprising that the average differential was the largest in the Far West (−2.8 percentage points), the Rocky Mountains (−2.0 percentage points) and New England (−1.8 percentage points) and the smallest in the Plains (−0.6 percentage points).⁵

In addition to there being a nationwide drop in labor productivity growth over time, there has been a significant amount of geographic variation in the productivity growth. During the previous expansion, it was fastest in Oregon at 4.3 percent and slowest in West Virginia with an average annual growth rate of just 0.7 percent. There were also significant variations at the regional level: Average labor productivity growth was fastest in the Far West (2.6 percent), the Plains (2.2 percent) and New England (2.1 percent); it was slowest in the Mideast (1.7 percent), Southeast (1.8 percent) and Southwest (1.8 percent).

The cross-sectional growth heterogeneity remains intact in the current expansion. Labor productivity grew fastest in North Dakota, averaging 5 percent, and second-fastest in Oklahoma, averaging 2.2 percent. The boost of labor productivity of these two states is very likely associated with the boom of the oil industry.

Some regions still fared better than others: Average growth was fastest in the Plains (1.6 percent), Great Lakes (0.8 percent) and the Southwest (0.6 percent). The other regions averaged growth that was near zero, with the Far West actually averaging negative growth (−0.1 percent).

Conclusion

We found that the labor productivity slowdown has been a widespread national phenomenon. This suggests that the main cause is a national rather than regional factor. However, we also found that the boom and bust of the housing market in some regions and states may have played a role in explaining why some states experienced a deeper drop in productivity growth than others. 

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

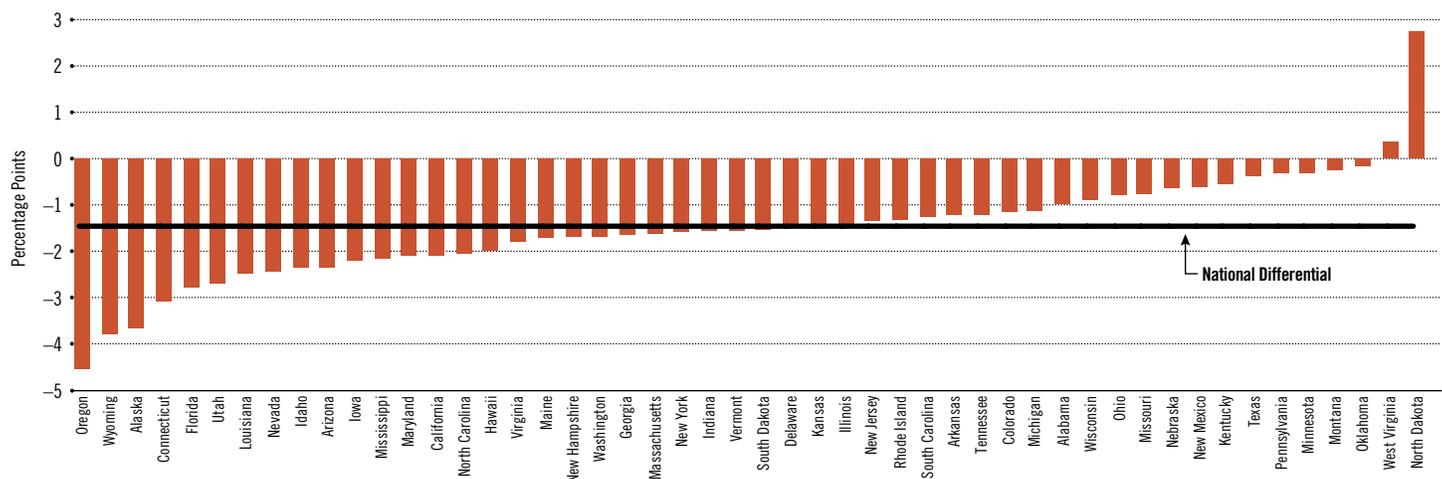
ENDNOTES

- 1 See Blinder, Irwin and Leubsdorf for examples of newspaper articles.
- 2 Although the U.S. expansion continues today, state and regional data available to us for this study only go through 2015.
- 3 The nonfarm business sector is the standard sector used by the Bureau of Labor Statistics (BLS) in its labor productivity analysis. As defined by the BLS, the nonfarm business sector “excludes general government, private households, nonprofit organizations serving individuals, and farms” and accounted for approximately 77 percent of total GDP in 2000. For this article, we approximated this sector by using GDP and employment data of the total private sector excluding farms.
- 4 We measured labor productivity using output per employee rather than the traditional measure of output per hour used by the BLS because hours data are not available at the state level for all of the years in our sample.
- 5 We used the regions delineated by the Bureau of Economic Analysis at www.bea.gov/regional/docs/regions.cfm.

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FIGURE 2
Labor Productivity Growth Differential between 2009-2015 and 2001-2007 Expansions



SOURCES: BEA, BLS and authors' calculations.

NOTE: The chart shows the difference in labor productivity growth rates between the current expansion (2009-2015), and the previous one (2001-2007). For example, Oregon's labor productivity in the latest expansion was 4.5 percentage points below the rate during the previous expansion. The differential for the nation was −1.5 percentage points, as shown by the dark horizontal line.

After Years of Decline, Yields on U.S. Treasuries Rise

By Maria A. Arias and Paulina Restrepo-Echavarria



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After almost eight years of declining yields, the second half of 2016 marked a turning point for the U.S. bond market, with yields on 10-year and 30-year Treasuries substantially increasing, especially during the last two months of the year. In this article, we describe several domestic and international factors that have affected demand for U.S. Treasuries and have potentially helped push yields higher.

Demand from Foreign Holders

Central banks have been one of the most reliable sources of demand for U.S. Treasuries since 2008. Between 2008 and 2013, the Federal Reserve's custody holdings of U.S. Treasuries for foreign central banks and other international institutions more than doubled, reaching about \$3 trillion.¹ At the peak in September 2015, foreign official institutions held a total of \$4.15 trillion in U.S. Treasuries (including the \$3 trillion held in custody at the Fed). In the year to September 2016, however, their Treasury holdings declined by \$245.8 billion, and those in custody at the Fed declined by \$185.4 billion.

China and Japan, the top two foreign holders of U.S. debt, together account for 37 percent of foreign-held Treasuries, while Belgium, Saudi Arabia and Russia account for an additional 5 percent. All of these countries have recently reduced their exposure to U.S. Treasuries (Figure 1), with their combined holdings declining by \$170 billion in the year to September 2016.

Each country has pulled back for a different reason. China has been selling U.S. Treasuries to defend its yuan in the face of capital outflows due to slower growth. Japan has been swapping Treasuries for cash and

T-bills because its prolonged negative interest rates have increased the demand for U.S. dollars. Saudi Arabia has been selling to cover its budget deficit after the long decline in oil prices. And Belgium is home to Euroclear Bank SA, which holds securities on behalf of other countries; some people have speculated that in the case of U.S. Treasuries, it was acting on behalf of China.²

Although holdings by foreign official institutions have steadily declined since mid-2015, U.S. Treasury yields had remained more or less stable until the latter half of 2016. In the face of larger sell-offs, the yields on the 2-year, 10-year and 30-year Treasuries increased by 24, 44 and 45 basis points, respectively, between their lowest point on the week ending July 6, 2016, and the week ending Nov. 2, 2016 (Figure 2).

Domestic Factors Affecting Demand

Two key events that contributed to the rapid increase in U.S. Treasury yields were the results of the U.S. national elections and the agreement by major oil-producing countries to cut oil production in order to reduce the oversupply of crude and lift its market price.

The election results in early November delivered a positive shock to U.S. financial markets overall, despite also triggering a sharp correction in the Treasury market. Expectations shifted with the anticipation of aggressive fiscal policy changes, including higher infrastructure spending, financial deregulation and a major tax overhaul. In theory, if these policy changes materialize, they could lead to higher growth rates and a quicker pace of inflation. But these policy changes would also lead to higher-than-anticipated levels of U.S. government debt

and a growing deficit,³ and, together with the deal to cut crude production, would reinforce expectations of higher inflation.

These fears drove investors worldwide to sell a massive amount of U.S., German and Japanese bonds, along with other fixed-income securities, causing yields to spike.⁴ In the weeks between Nov. 2 and Dec. 7, yields on the 2-year, 10-year and 30-year Treasuries increased by 30, 58 and 50 basis points, respectively (Figure 2).

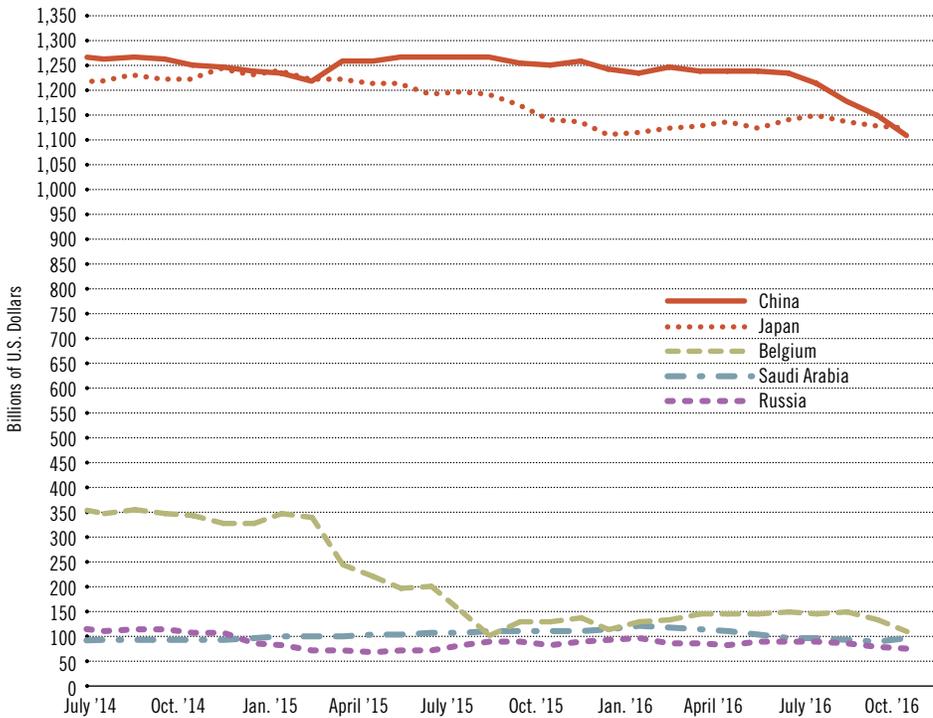
As for recent changes in monetary policy, the Federal Open Market Committee (FOMC) decided at its December meeting to raise the target range for the federal funds rate by 25 basis points, moving in line with the markets and also expecting economic activity to expand gradually. In its press release, the FOMC cited further improvements in labor market conditions and expected inflation in the coming months as the factors behind its decision.⁵ The committee's move boosted short-term interest rates further and stalled the rise in longer-dated yields, as investors moved from short-term to long-term securities.

Implications Ahead

Softer demand for long-term U.S. Treasuries—demand from central banks or investors worldwide—will keep yields trending upward faster than previously anticipated and could lead to higher borrowing costs in the near future. Though central banks' actions have been mainly in response to their unique circumstances, the global market's response has mainly focused on expectations of higher inflation and fiscal policy changes in the U.S. that may or may not materialize. Meanwhile, the FOMC has signaled that monetary policy is likely to

FIGURE 1

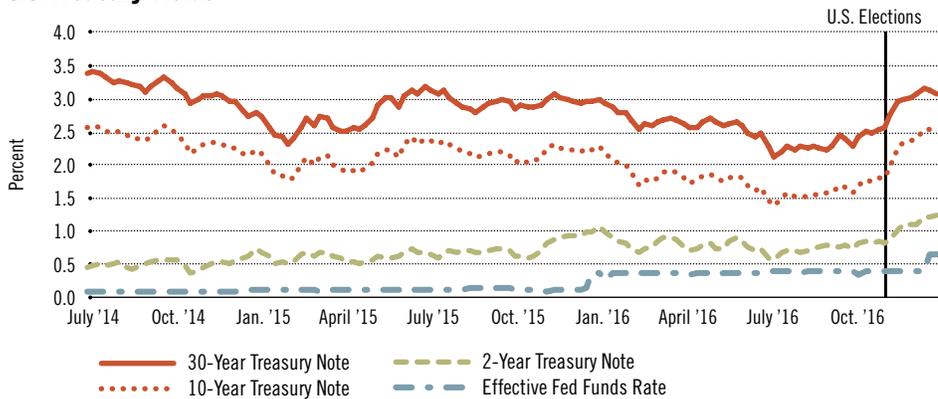
Select Countries with Declining Holdings of U.S. Treasuries



SOURCE: U.S. Treasury.

FIGURE 2

U.S. Treasury Yields



SOURCE: Federal Reserve Board.

gradually tighten according to the evolution of economic conditions.

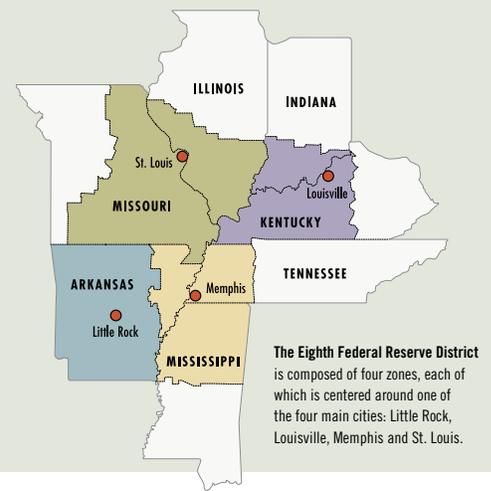
Will demand from foreign central banks and investors pick up again? Will the cut in oil production hold, helping oil prices rise and pushing broader prices higher? Will a stronger dollar keep inflation at bay, or will rising inflation expectations push investors further from short-term to long-term Treasuries? Answers to these questions will also

shed light on the future path of monetary policy. ^Ω

Paulina Restrepo-Echavarria is an economist, and Maria Arias is a senior research associate, both at the Federal Reserve Bank of St. Louis. For more on Restrepo-Echavarria's work, see <https://research.stlouisfed.org/econ/restrepo-echavarria>.

ENDNOTES

- ¹ Custody holdings are securities kept on behalf of some client, such as a foreign government or central bank.
- ² See Kim.
- ³ An August 2016 Congressional Budget Office report projected public debt would be \$14 trillion at the end of 2016 and \$23 trillion at the end of 2026 (76.6 percent and 85.5 percent of gross domestic product [GDP], respectively).
- ⁴ See Leong, as well as Faucon, Hodge and Said.
- ⁵ See the FOMC's December press release at www.federalreserve.gov/newsevents/press/monetary/20161214a.htm.



Disability Rate Exceeds Nation's; Problem Is Worse in Rural Areas

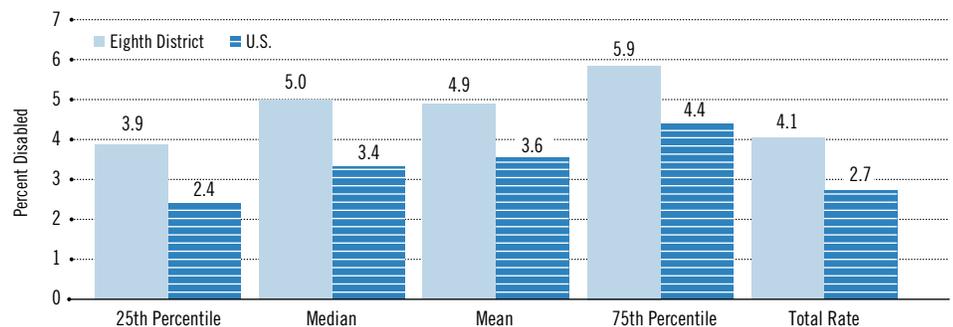
By James D. Eubanks and David G. Wiczer

The Eighth District has a much higher share of Social Security Disability Insurance (SSDI) recipients than the rest of the country: Inside the District, 4.1 percent of the population are SSDI recipients, but in the rest of the country, 2.6 percent receive SSDI.¹ Large differences in disability rates are not unusual across geographies, however. Outside the District, the interquartile range—a measure of the spread between the counties with the lowest rates of disability and the highest rates of disability—is 1.8 percentage points. Even within the District, the interquartile range across counties is 2.0 percentage points. Figure 1 shows summary statistics for disability rates across counties in the U.S. and in the Eighth District. It has two messages: Disability is quite dispersed, and rates are uniformly high in the District.

The Role of Job Availability

Why should there be so much variation in disability rates across geographic regions? Although we all face health risks that might prevent us from working, it is well-established that health outcomes differ across regions. Geographic differences in behavior, genetics and health care may all contribute to this variation. However, SSDI not only tracks health outcomes across geographic regions, it responds to differences in economic conditions across geographic regions. In a region with ample job opportunities, workers who suffer physical disabilities are more likely to be able to find work that is suitable for their skills and capabilities; however, in a region with relatively sparse jobs and where many of the jobs have fundamental manual requirements, it will be difficult for disabled people

FIGURE 1
Summary Statistics



SOURCES: Social Security Administration, Census Bureau and authors' calculations.

to find work. Of course, these economic differences will affect the likelihood that a worker applies for SSDI. The Social Security Administration (SSA) explicitly considers these economic factors when granting benefits.

The SSA awards process introduces criteria sequentially, considering new factors at each stage. Initially, disability is decided purely on the applicant's health condition. For marginal cases, for which there is a clear health problem but not one that obviously prevents all work of any kind, the SSA will examine "vocational considerations"—the worker's other job prospects. Increasingly, these marginal cases are becoming the norm.

Vocational considerations cases have been an important factor in the rise in disability over time. SSDI rolls have increased steadily since 1984, tripling as a fraction of the population, even as the eligibility criteria have remained mostly unchanged. As we point out in our 2016 study, vocational considerations have risen from about

one-fourth of awards to about three-fifths.² These economic criteria have a prominent role in the SSDI awards process; so, we could reasonably expect that disability rates would follow the great disparities in job opportunities across counties. Time and again, we are reminded that regions have diverged economically—so too have SSDI rates, in part because its awards process responds to the economic conditions its applicants face.

Within the Eighth District, there are large differences in disability rates, as we saw in Figure 1. These differences are especially stark, however, when we compare rural and nonrural counties, the latter being metropolitan statistical areas (MSAs). The differences are summarized in the table. Disability rates are much lower in counties within the District's MSAs than in rural counties. The median disability rate among MSA counties in the Eighth District is 1.2 percentage points lower than the median among rural counties. Rural counties also have a wider range of disability

rates than MSA counties: The difference between the rural counties with relatively high disability rates (those in the 75th percentile) and those with low disability rates (those in the 25th percentile) is 1.7 percentage points, compared with 1.5 percentage points for MSA counties. However, among both rural and nonrural counties, the spread around the mean is roughly symmetric, which we can see from the fact that the mean and median are approximately equal in both groups.

Additionally, there are numerous sparsely populated counties with high disability rates. These counties account for the difference between the average disability rate as seen in the table for the counties, 4.9 percent, and the total disability rate in the District as seen in the bar chart, 4.1 percent. The former is a simple average of the county disability rates, while the total disability rate is the total number of people on disability rolls in the District divided by the total population of the District.

Figure 2 shows clear patterns as to where the incidence of disability is concentrated. The Ozarks region spanning north-central Arkansas and southeastern Missouri has a high concentration of counties with uniformly high rates of disability. Elsewhere in the District, north-central Mississippi has another high concentration of high disability. These rural areas are historically very poor, and employment opportunities have always been scant. In these regions, a worker whose health prevents physically demanding work will find it difficult to obtain other employment opportunities. The result, as we see, is a high incidence of disability.

Conclusion

The data are informative about the state of the labor market in the Eighth District relative to the rest of the country. By some measures, the District looks quite similar to the nation. For instance, the unemployment rate in the District has been within a few percentage points of the national rate for several months. But unlike business cycle indicators such as the unemployment rate, SSDI is slow to adjust and reflects a long-term trend. Whereas indicators like median wage growth tell us how the average worker is doing, SSDI tells us more

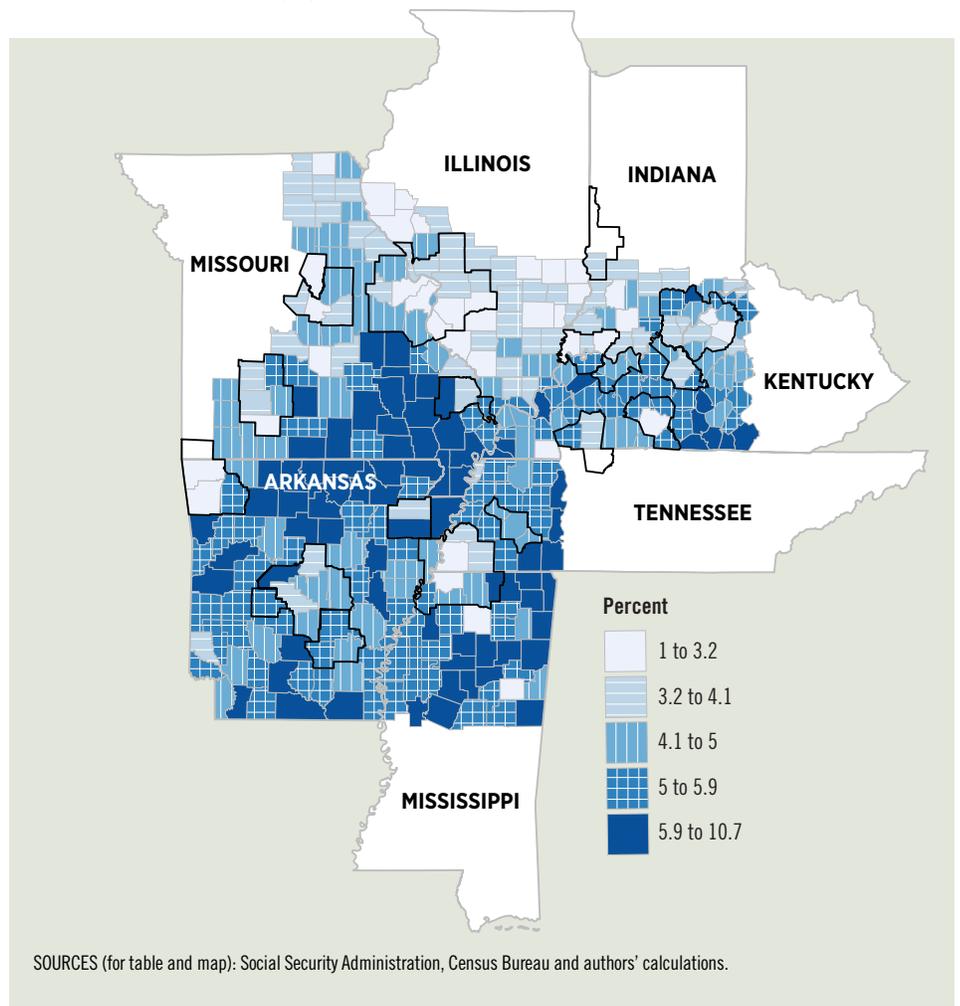
Disability Rates in and out of MSAs

	Minimum	25th Percentile	Median	Mean	75th Percentile	Maximum
All Counties	1.7%	3.9%	5.0%	4.9%	5.9%	8.3%
MSA Counties	1.7%	3.4%	4.1%	4.1%	4.9%	6.8%
Non-MSA Counties	2.4%	4.3%	5.3%	5.2%	6.0%	8.3%

FIGURE 2

Disability Rates by County in the Eighth District States

Disabled Workers as Share of Total County Population



about how the least prosperous worker is doing. Those who receive disability insurance very rarely work again, but benefits—which average about \$1,200 per month—are scarcely as much income as even unskilled workers can make. ¹

David Wiczer is an economist, and James Eubanks is a senior research associate, both at the Federal Reserve Bank of St. Louis. For more on Wiczer's work, see <https://research.stlouisfed.org/econ/wiczer>.

ENDNOTES

- ¹ This article considers recipient workers of SSDI, rather than survivors and dependents who also may claim benefits. This prevents variation in household size across geographies from affecting our conclusions.
- ² See Michaud, Nelson and Wiczer.

REFERENCE

Michaud, Amanda; Nelson, Jaeger; and Wiczer, David. "Vocational Considerations and Trends in Social Security Disability." Federal Reserve Bank of St. Louis working paper series, 2016, No. 2016-018A.

The new year brings a new feature to The Regional Economist: the Industry Profile. In each issue, we will examine a different industry that is important to the economy of the Eighth District, the seven-state area served by the St. Louis Fed. This inaugural article looks at several aspects of commercial real estate, mainly the multifamily housing industry. The Industry Profile replaces the Metro Profile.

Multifamily Housing Shows Strong Growth, Leading to Bubble Fears

By Charles Gascon and Joseph McGillicuddy



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The commercial real estate industry has experienced robust growth since the end of the Great Recession (2007-09). Property prices have grown steadily and are now at their pre-recession peak in real terms, on pace to surpass historical highs. Similarly, vacancy rates have declined consistently over the same period. The multifamily vacancy rate is at a 30-year low.

Construction has ramped up over the past few years in response to the lack of supply in the market. Since 2012, real (inflation-adjusted) private fixed investment in commercial structures has increased by more than 13 percent per year on average. (Still, it has yet to catch up to the level of activity seen in the decade leading up to the Great Recession, the latest recession we've had.) There has also been brisk lending by commercial banks, with the amount of real estate commercial loans approaching its previous peak in real terms.

This strong growth in asset prices and lending markets has caused the industry to receive increased attention by Fed officials over the past year or so. Since December 2015, the Board of Governors has issued supervisory guidance to commercial banks regarding commercial real estate. Then, in late August, Boston Fed President Eric Rosengren gave a speech in which he warned of "building pressure" in commercial real estate as a result of a low interest rate environment. He specifically pointed out the striking rise in multifamily property prices.

In this article, we look at the factors driving growth in the multifamily market, analyze the signs of a potential bubble and compare national trends with those in the Eighth District.

Multifamily Is Especially Strong

Of all the major commercial real estate categories, the multifamily market has strengthened the most since the last recession. Real property prices have exceeded their pre-recession peak, increasing at a faster rate than office and retail property prices. Multifamily rents have been growing about 3 to 4 percent per year since 2012, much faster than general prices. Construction activity has accelerated in the past few years; multifamily starts are currently above the levels seen in the mid-2000s, and completions are not far behind.

This recent growth appears to be the result of both an increase in demand for, and decrease in supply of, multifamily units following the collapse of the housing market and the recession that followed. Demand for renting accelerated in large part because many households were displaced due to foreclosures. Poorer job prospects and tighter lending standards also made buying a house more difficult. Consequently, more and more individuals turned to renting over homeownership, as demonstrated by the steady decline in the homeownership rate since 2005 of those under 65.

Other trends have also consistently increased multifamily demand over the past

15 years. One such tendency is that households continue to delay the purchase of their first home for various reasons, for example waiting longer to marry and have kids, thus renting for longer periods of time. While young adults have been the main drivers of demand, the gradual aging of the population has also fueled demand in the past few years. Baby boomers have shown a greater predisposition to rent as they get older; demand is rising not just for regular apartments but for senior-living facilities.¹

On the supply side, there was a sharp drop in construction activity during the Great Recession as builders went out of business and banks were less willing to lend. So, as demand began to experience significant growth, there was a severe fall in new units entering the market, leading to a large gap between demand and supply. Construction activity picked up after the recession ended, but six years passed before the amount of new multifamily units entering the market each month matched levels seen prior to the recession.

Is There a Bubble?

The strong appreciation in property prices and the sharp increase in lending activity are cited as warning signs that an asset bubble may be forming in the multifamily market. While these trends are driven by fundamentals, there is a risk that investors' expectations for future demand are unrealistically high. Some of this stems from concerns that low

TABLE 1
Selected Average Annual Growth Rates

		Average Annual Growth Rate (%)	
		2000-2007	2012-2016
Real Commercial Real Estate (CRE) Prices	U.S. (All)	5.1	5.5
	U.S. (Apartment)	5.7	5.4
	U.S. (Industrial)	5.4	6.2
	U.S. (Office)	4.5	5.0
	U.S. (Retail)	5.8	5.1
	East (All)	5.5	3.3
	Midwest (All)	1.4	2.2
	South (All)	4.1	6.0
	West (All)	7.6	7.9
Real CRE Private Fixed Investment	U.S.	-0.2	13.4
Real CRE Loans	U.S.	9.9*	4.8
Apartment Rent	U.S.	3.4	3.8
	Little Rock	2.1	2.5
	Louisville	2.4	3.1
	Memphis	2.2	2.3
	St. Louis	2.9	2.5
Core Consumer Price Index	U.S.	2.2	1.9
	Midwest	1.8	1.6
	St. Louis	2.0	1.5

*Data starts in 2004.

SOURCES: National Council of Real Estate Investment Fiduciaries (NCREIF), Bureau of Economic Analysis, Federal Reserve Board of Governors, Reis, Bureau of Labor Statistics and Haver Analytics.

NOTES: East, Midwest, South and West are Census Bureau regions; Little Rock, Louisville, Memphis and St. Louis are the four largest MSAs in the St. Louis Fed's Eighth District. Growth in CRE prices is calculated from NCREIF transactions-based price indexes adjusted for inflation using the gross domestic product (GDP) deflator. CRE loans are adjusted for inflation using the consumer price index. Calculations for 2012-2016 used data only through the third quarter.

TABLE 2
Selected Average Values

	Region	2000-2007	2013	2016
CRE Private Fixed Investment <i>(Billions of chained 2009 dollars, seasonally adjusted annual rate)</i>	U.S.	229	136	201
Homeownership Rate (%)	U.S.	68.3	65.1	63.3
	Eighth District	72.8	69.5	68.1
Apartment Vacancy Rate (%)	U.S.	5.6	4.3	4.4
	Little Rock	6.3	7.2	7.0
	Louisville	7.9	4.5	5.0
	Memphis	9.3	8.6	7.7
	St. Louis	6.5	4.8	4.1
Industrial Availability Rate (%)	U.S.	10.1	11.4	8.6
	St. Louis	9.3	13.0	7.8
Office Vacancy Rate (%)	U.S.	14.0	16.9	16.0
	Little Rock	11.5	11.7	12.1
	Louisville	14.0	15.2	14.4
	Memphis	17.3	23.0	23.0
	St. Louis	15.5	18.0	16.6
Monthly Building Permits: 5+ Unit Buildings (Units)	U.S.	28,422	27,019	32,309
	Eighth District	428	288	537

SOURCES: Bureau of Economic Analysis, U.S. Census Bureau, Reis, CBRE Group Inc. and Haver Analytics.
NOTES: Little Rock, Louisville, Memphis and St. Louis are the four largest MSAs in the Eighth District. The Eighth District homeownership rate is the weighted average of the homeownership rates for all states in the District excluding Illinois (since most of that state's economic activity—and population—stems from the Chicago area, outside of the District). The District's other states are Arkansas, Indiana, Kentucky, Mississippi, Missouri and Tennessee. Eighth District monthly building permits are the sum of permits for the Little Rock, Louisville, Memphis and St. Louis MSAs. Calculations for 2016 used data only through the third quarter.

interest rates have led to riskier lending as investors seek higher yields, a point brought up by Rosengren in his speech. Although the number of renting households has steadily increased since 2005, there is a good chance that demand growth will slow to a more sustainable level once the homeownership rate stabilizes. That could happen sooner rather than later because millennials—even though they are renting more now than did previous generations at the same point in their lives—say that they want to be homeowners eventually.²

A slowdown in demand should be relatively modest as other demand drivers remain strong. The number of adults 18-34 years of age—the age group with the highest propensity to rent—is projected to rise, and the data suggest that more young adults are starting to move out of their parents' houses. The American population will also continue to age, adding demand at that end as well, as baby boomers downsize. Such a slight

slowdown in demand growth should allow supply to adjust to the change smoothly.

Local Growth More Modest

Post-recession growth in commercial real estate prices has been much more modest in the Midwest than in the rest of the country. Real prices are still about 20 percent below the previous peak, right in line with levels seen from 2000 to 2005. In contrast, prices in the other three Census Bureau regions are above or just below their previous high points.

Construction activity has also been relatively more moderate. In the four largest metropolitan statistical areas within the Eighth District (Little Rock, Ark.; Louisville, Ky; Memphis, Tenn.; and St. Louis), the number of nonresidential construction projects and the amount of space under construction have ramped up in recent years, but both remain below pre-recession peaks.

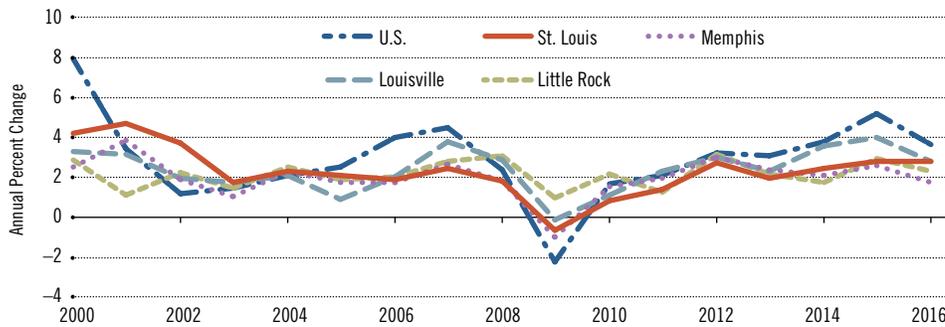
Despite this slower growth relative to the nation, commercial real estate demand



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FIGURE 1

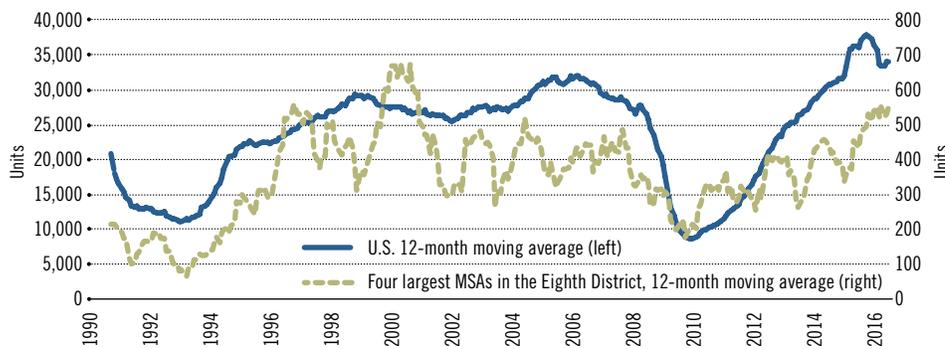
Apartment Rent



SOURCE: Reis and authors' calculations.

FIGURE 2

Monthly Building Permits: 5+ Family Buildings



SOURCES: U.S. Census Bureau and Haver Analytics.



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remains strong. Local real estate contacts have generally reported year-over-year increases in the demand for most property types over the past eight quarters. Much of this demand growth is concentrated in industrial property because the region is a distribution hub.

A similar story presents itself when zeroing in on the multifamily market. Rent growth in the region has been fairly moderate. Within the District's four largest MSAs and the Midwest region, rent has grown about 2-3 percent per year since 2012, closer to the average increase in overall prices than average rent growth in the nation. Louisville has seen slightly more robust rent growth in recent years, most likely because the MSA's economy is generally outperforming the rest of the region.

Trends in local vacancy rates are analogous. The multifamily vacancy rates in Louisville and St. Louis have closely mirrored that of the nation since the end of the last recession, declining swiftly before stabilizing

at relatively low levels, between 4 and 5 percent. On the other hand, rates in Memphis and Little Rock are currently at more elevated levels, about 7 percent. Little Rock's higher rate is due to a significant influx of newly constructed units from 2012 to 2014, causing the vacancy rate to increase by more than 2 percentage points during that time period. The metro's vacancy rate has been trending down since.

Multifamily construction has also had a more modest run-up in the Eighth District compared with what's happening in the nation as a whole. Apartment completions in the four major MSAs combined have recovered to the levels of activity witnessed before the recession but have stopped there. Meanwhile, national completions have increased well beyond their average in the mid-2000s.

Still, there are risks of overbuilding in the District. Multifamily building permits have recently begun to exceed their pre-recession average in the four largest MSAs. Anecdotal evidence suggests that much of the new investment is coming from outside the region. If these outside investors do not have a solid understanding of the more modest drivers of growth in local markets, there is a risk that some of these new projects may be excessive. ^Ω

Charles Gascon is a regional economist, and Joseph McGillicuddy is a senior research associate, both at the Federal Reserve Bank of St. Louis. For more on Gascon's work, see <https://research.stlouisfed.org/econ/gascon>.

ENDNOTES

- ¹ See Rappaport for further discussion.
- ² See Shahdad.

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ASK AN ECONOMIST



Maximiliano Dvorkin has been an economist at the Federal Reserve Bank of St. Louis since 2014. His research focuses on labor reallocation and the effect of different economic forces on the employment and occupational decisions of workers and on their well-being. In his spare time, he enjoys the outdoors, cooking and spending time with his family. For more of his research, see <https://research.stlouisfed.org/econ/dvorkin>.

Q: What is the impact of Chinese imports on U.S. jobs?

A: Although most economic models point to overall gains from trade, these gains are not distributed evenly across workers and regions. With that in mind, Lorenzo Caliendo, Fernando Parro and I studied the impact of the surge of imports from China between 2000 and 2007 on different U.S. labor markets.¹ In particular, we examined how workers in different sectors, like manufacturing or services, and in different regions were affected.

Of the more than 3 million manufacturing jobs that were lost overall in the U.S. between 2000 and 2007, we found that about 800,000 manufacturing jobs were lost because of the increased Chinese competition. Most of these jobs were in the production of computer and electronic goods, primary and fabricated metal products, furniture and textiles.

As might be expected, larger states experienced larger losses in manufacturing jobs. After controlling for size, we found that states with a larger share of manufacturing employment (e.g., Ohio) experienced a larger than average loss, while the opposite was true for states with a smaller share of manufacturing employment (e.g., Florida).

Despite the job losses in manufacturing, the economy gained a similar number of jobs in other sectors, such as services, construction, and wholesale and retail trade. These sectors, which were not very exposed to Chinese competition, benefited from having access to cheaper intermediate inputs. As a result, U.S. firms in these sectors were able to lower their production costs. In turn, consumers were able to purchase these U.S. goods at a lower price. Between these savings and the savings on cheaper Chinese-made goods that they bought, U.S. consumers gained an average of \$260 of extra spending per year for the rest of their lives, we estimated, all stemming from the increased imports from China.

Research like ours enhances the understanding of who gains and who loses from international trade. An important consideration is how to create policies that help those who are hurt by trade without our losing the gains from it. Further research is needed to answer this important question.

¹ Caliendo, Lorenzo; Dvorkin, Maximiliano; and Parro, Fernando. "Trade and Labor Market Dynamics." Working Paper 2015-009C, Federal Reserve Bank of St. Louis, August 2015. See <https://research.stlouisfed.org/wp/more/2015-009>.



For more discussion on this topic, listen to the Timely Topics podcast with Dvorkin at www.stlouisfed.org/timely-topics/chinese-imports-us-jobs.

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The Federal Reserve Bank of St. Louis recently released FREDcast, a free interactive forecasting game in which players forecast four economic variables every month, track their forecasts' accuracy on scoreboards and compete with friends and other players in leagues.

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A webinar March 8 will focus on free resources that can be used for exploring careers, saving for college and navigating financial aid, among other preparations for students' futures. Teachers are the main target audience for the webinar, but parents also can benefit from learning about these resources, which come from several Federal Reserve banks and include publications, infographics, videos, audios and online courses.

Teachers can earn professional development credit for participating in the one-hour webinar, which is part of the Classroom ECONnections with the Fed series. To accommodate those living in different time zones, the webinar will be offered twice: at 3-4 p.m. CT and at 4:15-5:15 p.m. CT.

The ECONnections event listing is live: www.stlouisfed.org/events/2017/03/ee-econnections0308.

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NEXT ISSUE

China's Growing GDP

Over the past 25 years, China's share of world gross domestic product (at purchasing power parity) has quadrupled. Some academics, however, argue that China's official GDP statistics may suffer from mismeasurement. In the Second Quarter issue of *The Regional Economist*, read about these concerns and learn about some of the methods academics are using to refine the official statistics.



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