FEDERAL RESERVE BANK of ST. LOUIS

2019:Q2 | VOL. 27 | NO. 2

RE REGIONAL ECONOMIST

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REGIONAL ECONOMIST

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"Digital wallets—called mobile wallets when associated with a cell phone—allow purchases and money transfers without the physical use of cash, checks or credit/debit cards."

—Julie Stackhouse, Executive Vice President

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How Many People Will Be Retiring in the Years to Come?

Answering this question is not only important for the Social Security Administration, but also for evaluating the labor market.

"Initially, it is evident that there will be around 10,000 people (taking the total of retiring males and females) turning 65 each day for the next two decades. ... Not surprisingly, the peak corresponds to the retiring of the baby boomers. From 2025 onward, the trend is declining, which is likely because of the baby bust that followed the baby boom."

—Guillaume Vandenbroucke, Research Officer and Economist

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Should I Go to College? Here's What Research Shows

That's no small decision, especially as the cost has risen dramatically, requiring nearly 4 in 10 undergrads to take out loans.

"In other research on the financial returns from college released last year, my colleagues found that, amazingly, your parents' education is also associated with how much wealth and income you will generate over your lifetime—whether you went to college or not."

—Ray Boshara, Senior Adviser and Director, Center for Household Financial Stability

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One Rate Does Not Rule Them All

Unemployment is uneven across U.S. counties.

"With only the national average unemployment rate and without a county-level view, we wouldn't know that lower unemployment rates concentrate in the Midwest and higher rates spread out over the rest of the nation."

—Sungki Hong, Economist

https://fredblog.stlouisfed.org/2019/06/one-rate-does-not-rule-them-all/

James Bullard Discusses Nominal GDP Targeting

Federal Reserve Bank of St. Louis President James Bullard discussed nominal gross domestic product (GDP) targeting in a St. Louis Fed Timely Topics podcast that was released April 19, 2019. The following excerpts are from the podcast. They have been edited for clarity and length.

Inflation targeting has been a great success story, and the question now would be, can you improve on that?

How does the Fed maintain price stability now?

My view of this is that, beginning in the 1990s, there was a coming together of the academic literature and practitioners in central banking around the concept of inflation targeting, which meant that central banks named an inflation target and conducted monetary policy in such a way as to hit that inflation target over the medium term. And this is commonplace today but at the time was a big shift compared to the '70s and '80s, when there weren't any inflation targets and it wasn't at all clear, relatively speaking, what the various central banks were doing.

I have to say, in the big picture, that inflation targeting has been crazy successful. Inflation has been much lower and much closer to these inflation targets across the countries that adopted them. Inflation's been much less variable than it was in the '70s and '80s. The inflation expectations in these various countries have become much less volatile and much more clustered around the inflation targets. So, inflation targeting has been a great success story, and the question now would be, can you improve on that?

What is nominal GDP targeting, and how is it different from inflation targeting?

In inflation targeting, we would name the inflation target, but if we missed the inflation target—either on the high side or the low side—you wouldn't be too worried about it. You'd say, "Well, OK, we'll try to hit it again next year or over the medium term, and we won't worry about the fact that we've missed it this year or maybe several years in a row."

With price-level targeting or its close cousin nominal income targeting, you would worry about past misses, and you would try to make up for past misses in such a way that you would stay on a path for the price level or a path for nominal GDP, depending on which route you went. But they're closely related.

So the main difference is that private-sector investors would understand that

you were going to make up for past losses, and they would understand that if you missed to the low side in the past, this would mean that future policy would likely miss to the high side for a little while. And, vice versa, if you missed on the high side for a while, then you would probably miss on the low side in the future for a little while.

And, in so doing, at least in theory, this would further cement inflation expectations—even more than they've already been controlled by the inflation targeting regime that's been in place the last 25 years. You would further pin down inflation expectations and therefore get even better monetary policy than what we've had over that period of time.

What would be the advantages of using nominal GDP targeting?

The biggest advantage is this idea that you would really cement inflation expectations around the target. This would give investors, financial market participants, households [and] businesses the confidence that the central bank really was going to deliver on what it said: It was going to deliver this 2% inflation rate. They could use that in their planning, and they could be reasonably confident that that was going to be the actual outcome in the economy over longer periods of time. This would help with getting the best allocation of real resources that we can get. So that would be the principal advantage.

I think the question about both nominal GDP targeting and price-level targeting is whether the additional gains that you would get are going to be that big compared to what you already are getting from inflation targeting.

Are there any disadvantages to nominal GDP targeting?

Some people say it hasn't been tried and it would be hard to communicate. And I think one way to convey that idea is that it really relies on private-sector expectations understanding the policy, and because they understand the policy, they expect inflation to be right around 2%. And because of that, you get good things to happen in the economy.

It's the kind of thing where you might say, "OK, we switched to nominal GDP targeting." Nobody notices in the entire economy. No one pays any attention, and you don't get any of these effects at all. I think that would be the kind of thing that is very practical and could possibly happen, because private-sector people might say, "Well, I don't understand it," or "I don't see what the difference is between this and inflation targeting. It's all too subtle."

The theories are relying on these things being really tight and really affecting these expectations a lot. But the reality might be a lot more distant than that.

Have any central banks used nominal GDP targeting?

No, not to my knowledge. And one of the criticisms is that we barely got everybody converted over to inflation targeting, and now you'd be switching again. The U.S., in particular, only named its inflation target in 2012. Japan's another country that didn't come around to inflation targeting until relatively recently.

It's not clear that you want to, then, make another change. Although I would say if you're going to make a change, you should make it during good times [and] not try to improvise when it's a very volatile area or high recession risk or something like that. If you wanted to make the change during calm, successful times for the economy, that's probably the time to do it.

I do think that one of the advantages of inflation targeting was that smaller countries took it on first and experimented with it, showed how it could be done, and then you had, eventually, the founding of the ECB [European Central Bank] coming on in the late '90s, and then the Fed following through later. And so you kind of tested it out in other places before you had the world's leading economies adopting it.

If the U.S. moved first and went with price-level targeting or nominal GDP targeting, that would be a different kettle of fish, and that would be something that has to be thought about carefully, I think. You'd be setting a trend in a global environment, and other countries would likely follow.

Anything else on this topic or how the Fed thinks about maintaining price stability?

I think it's under review in 2019, and it's something the Fed will consider, I think, as part of its review. I think it's good to be thinking about possible innovation in monetary policy frameworks as time goes on. Surely, the framework we're using today will not be the same one we're using 50 years from now. And, in order to be able to evolve at the right moments, we have to have regular reviews and think about these issues. And I think that's the purpose of this framework review in 2019. RE

(This article was published online May 13.)

I think it's good to be thinking about possible innovation in monetary policy frameworks as time goes on.

To listen to Bullard's full podcast, go to **www.stlouisfed.org/timely-topics/bullard-discusses-nominal-gdp-targeting**.

The Rise of Automation:
How Robots May Impact the U.S. Labor Market

By Asha Bharadwaj and Maximiliano Dvorkin

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KEY TAKEAWAYS

- Industrial robots are a type of automation technology that could lead to a structural shift in the labor market, particularly among routine manual jobs.
- The use of robots has expanded globally. In the U.S., there were 1.79 robots per thousand workers in 2017, up from 0.49 robots per thousand workers in 1995.
- An analysis of data suggests that more robots in a U.S. commuting zone may reduce the number of workers in routine manual jobs relative to the zone's population.

An important long-run change in U.S. labor markets is the decline of middle-skill occupations, like manufacturing and production jobs, and the growth in both high- and low-skill occupations, like managerial jobs on one end and jobs that assist or care for others on the other. Economists have coined the term "job polarization" for this process.[1]

As has been argued in the economic literature, the most likely drivers of job polarization are automation and offshoring, because both these forces lower the demand for middle-skill occupations relative to the rest. Automation refers to any technology that reduces the need for human assistance. For instance, processes such as grocery store checkout have been automated to a great degree and thus require less labor to perform routine tasks. Similarly, some stages of the production process of a good or service can be performed in foreign countries; therefore, certain tasks can be outsourced. In general, the types of tasks that can be outsourced are mostly routine tasks.

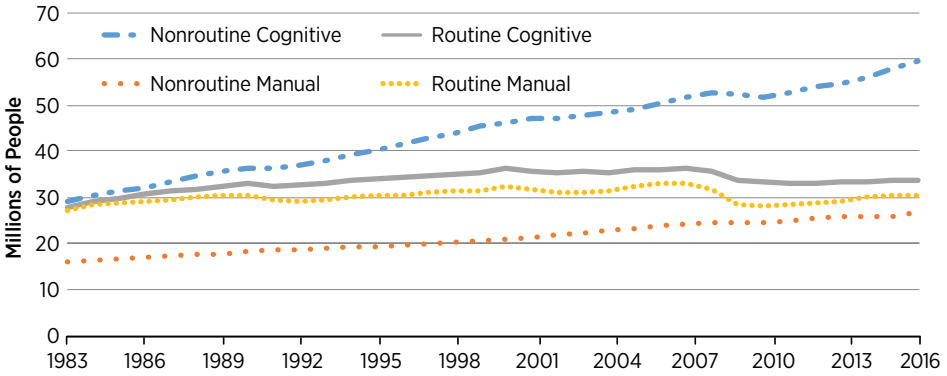
In this article, we focus on industrial robots, which are a specific type of automation technology. The International Federation of Robotics (IFR) defines an industrial robot as an "automatically controlled, reprogrammable [and] multipurpose manipulator, programmable in three or more axes, which can be either fixed in place or mobile for use in industrial automation applications."[2] In other words, industrial robots are fully autonomous machines that do not require any human intervention and can be reprogrammed to perform several manual tasks. For instance, technologies like tractors or elevators are not industrial robots since they are able to perform only specific tasks and require some degree of human intervention.

Several economists believe automation represents a wave of technological change that could lead to a structural shift in the labor market. History suggests that this belief is well founded. In the early 19th century, the first industrial revolution was characterized by the development of the steam engine and the water wheel, and it changed the nature of the economy from being agrarian to urban. The second wave of technological change was marked by the increasing adoption of electricity by industries and technological advances such as the telephone and the internal combustion engine. The third industrial revolution was characterized by digitalization and the adoption of computers and the internet, and it changed the way in which information was transmitted and shared. Nowadays, the growth of automation and similar technological advances continue to accelerate, and many believe that the fourth industrial revolution has already begun.

In this article, we look closely at the link between industrial robots and employment in routine manual occupations. In a series of recent academic articles, economists Daron Acemoglu and Pascual Restrepo have studied the effects of the rapid increase in the use of manufacturing robots on the labor market, and we follow these works very closely in our analysis here.[3]

Figure 1

Employment Level by Occupational Group



SOURCES: U.S. Bureau of Labor Statistics and authors' calculations.

The Decline in Routine Jobs

Given the previous discussion, it is important to classify occupations according to the routine content. In addition, we also distinguish between occupations based on whether an occupation uses mostly cognitive skills or manual skills (brain vs. brawn).

Figure 1 shows the evolution of U.S. employment across different types of occupations:[4]

- Nonroutine cognitive, which includes management, professional and related occupations
- Nonroutine manual, which includes service occupations related to assisting or caring for others, such as health care support, food preparation and serving, and cleaning
- Routine cognitive, which includes sales and office occupations
- Routine manual, which includes construction, transportation, production and repair occupations[5]

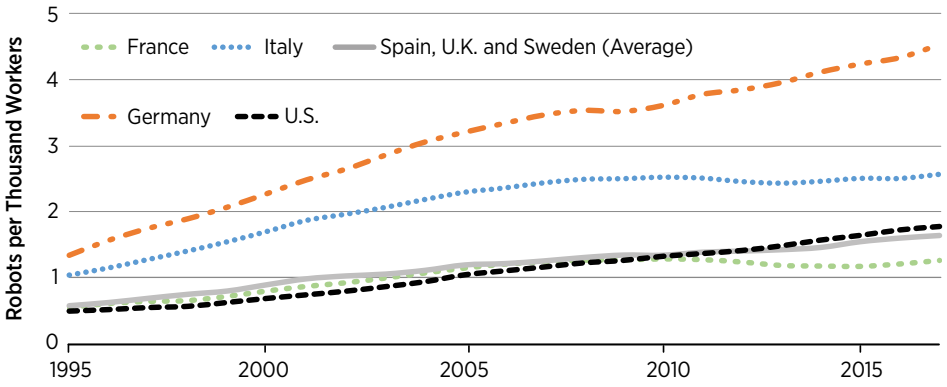
ABOUT THE AUTHORS

Maximiliano Dvorkin (left) is an economist at the Federal Reserve Bank of St. Louis. His research focuses on labor reallocation and the effect of different economic forces on workers' employment and occupational decisions. He joined the St. Louis Fed in 2014. Read more about the author and his research at https://research.stlouisfed.org/econ/dvorkin.

Asha Bharadwaj (right) is a research associate at the Federal Reserve Bank of St. Louis.

Figure 2

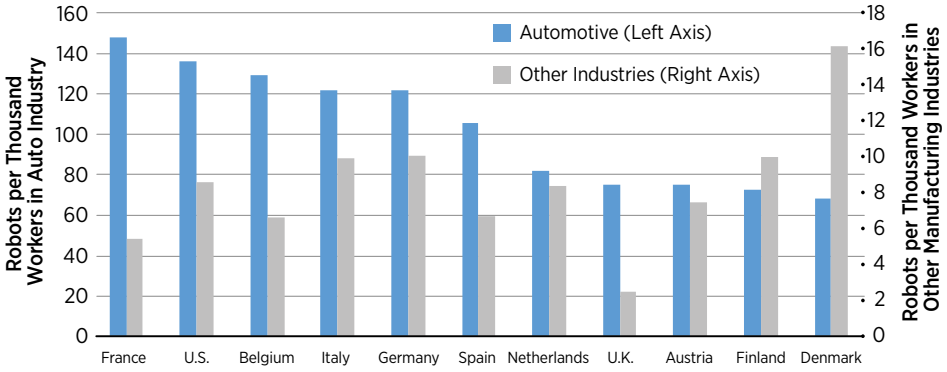
Evolution of the Stock of Robots in Advanced Economies



SOURCES: International Federation of Robotics, Eurostat, U.S. Bureau of Labor Statistics and authors' calculations.

Figure 3

Robots in Manufacturing: Auto vs. Other Industries in 2017



SOURCES: International Federation of Robotics, Eurostat, U.S. Bureau of Labor Statistics and authors' calculations.

The picture is clear: Employment in nonroutine occupations, both cognitive and manual, has been increasing steadily for several decades, while employment in routine occupations has been mostly stagnant or even declining.

Adoption of Industrial Robots

We start by analyzing the evolution of the adoption of robots in the production of goods and services around the world. For this, we use data from IFR, which publishes data on the stock of robots by country, industry and year. The IFR data are based on surveys of robot suppliers and, as we said before, define an industrial robot as an automatically controlled, reprogrammable and multipurpose manipulator for use in industrial automation applications.

Figure 2 presents the evolution of the stock of industrial robots per thousand workers for a group of advanced economies around the world: the U.S., Germany, Italy, France, and an average for Spain, the U.K. and Sweden. These countries had the highest stock of industrial robots in 2017, and we grouped the bottom three—Spain, the U.K. and Sweden—to make the figure more readable.

We highlight two important facts from the data. First of all, there has been an important increase in the use of robots around the world, which in most cases has more than doubled in the last 20 years. The U.S. had a stock of 0.49 robots per thousand workers in 1995, which rose to 1.79 robots per thousand workers in 2017.

Second, we found that Germany and Italy are ahead of the U.S. in terms of adoption of robot technology in production, as measured relative to employment. France and the average of the countries Spain, the U.K. and Sweden were ahead of the U.S. in the late 1990s and early 2000s, but in the last decade, it seems that the U.S. has overtaken these countries.

This massive growth in the use of robots worldwide, particularly in the U.S., has motivated Acemoglu and Restrepo—and more recently, other economists—to investigate robots' impact on U.S. labor markets.

Adoption of Robots across Industries

An important question arises: Is the use of robots uniform across industries? If not, is there a specific industry that is driving the adoption of robots?

Figure 3 highlights the use of robots in the automotive industry relative to the use of robots in all other manufacturing industries, as a share of employment in the respective industry.

Clearly, the automotive industry is by far the largest user of robots, in the U.S. as well as in other advanced countries around the world. For instance, in 2014, the automotive industry accounted for around 54% of the total U.S. stock of robots. For Germany, the share was higher, at around 60%.

From Figure 3, we observe that in all the countries shown, the ratio of robots to workers in the auto industry is far greater than the ratio of robots to workers in all

other manufacturing industries combined. For instance, the U.S. auto industry employed 136 robots per thousand workers, while all other manufacturing industries in the U.S. employed only 8.6 robots per thousand workers. Similarly, France's auto industry employed nearly 148 robots per thousand workers, while the rest of the manufacturing sector employed 5.5 robots per thousand workers.

The Link between Robots and Local Labor Markets

So far, we showed that there has been a rapid increase in the use of robots for production and that, as the previous figure suggests, this increase has not been uniform across different industries and, thus, across different types of workers.

Therefore, we now look closely at the asymmetric effects across labor markets. Several outcomes are possible. For instance, some workers in the automotive industry, possibly those conducting more manual and routine tasks, may be experiencing job losses as more and more of these jobs are automated by the use of robots. On the other hand, it is also possible that robots raise overall productivity and efficiency, leading to an increase in the demand for other types of jobs that are more complementary to the use of robots, like technicians. In addition, it is also possible that other industries benefit from these productivity spillovers and in turn increase their own demand for labor.

To study these effects more closely, we turn to local labor markets in the U.S. For this, we use the concept of a commuting zone and relate this to a local labor market. A commuting zone can be defined as a geographic unit that combines counties into an area that reflects the concept of a local labor market better than a metropolitan statistical area does.

We followed Acemoglu and Restrepo's methodology (2019) and constructed a measure for commuting zones' exposure to the increase in robots employed in production. To do this, for each industry and for each commuting zone, we divided the change in the stock of robots between 2004 and 2007 by the number of people employed in that industry in 1990. We then adjusted this term for the overall growth of production in each industry, and the results gave us the number of adjusted robots per thousand workers for each commuting zone.

We then weighted this by the baseline employment level in that commuting zone in the year 1990, which is the start of the period that we analyze. This gives us a measure for the exposure of a commuting zone to the increase in robots employed in production.

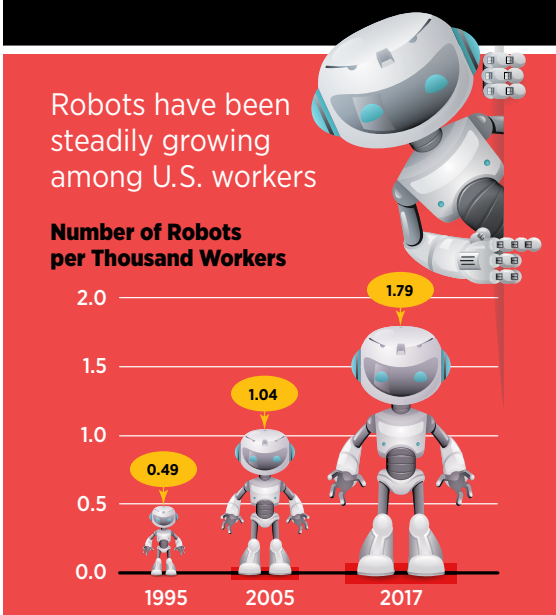
The International Federation of Robotics has data for 13 industries within manufacturing and for six broad sectors outside of manufacturing. Within manufacturing, we have data on apparel and textiles; automotive; basic metals; clay, glass and minerals; electronics; food and beverages; industrial machinery; metal products; paper and publishing; plastics, chemicals and pharmaceuticals; shipbuilding and aerospace; wood and furniture; and a miscellaneous manufacturing category. Outside of manufacturing, we have data for agriculture, construction, mining, research and education, services, and utilities.

Industry-level data for the U.S. are available starting in 2004, which is why our measure for the exposure to robots uses the change in the stock of robots between 2004 and 2007. We rescaled our measure of exposure to robots to match the length of the time period on which we focused (1990-2007). We ended our analysis in 2007 to prevent the effects of the Great Recession from confounding our results.

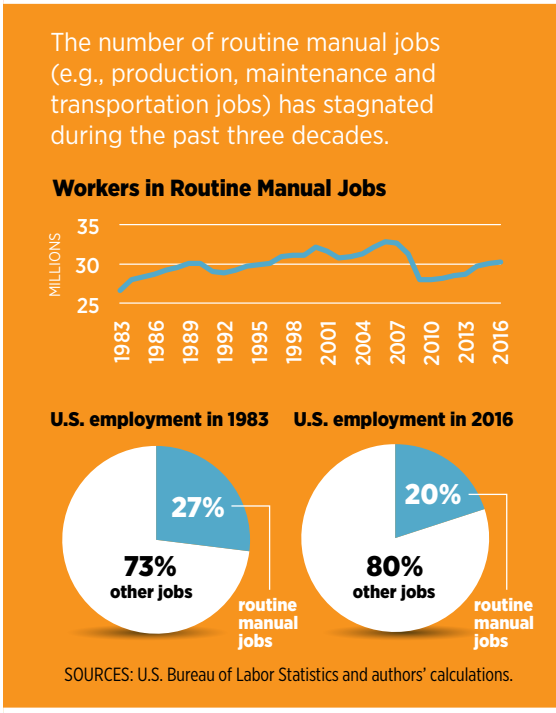
Figure 4 shows the map of U.S. commuting zones and their growing exposure to robots and automation in production. We observe that there is a concentration of rising exposure to robots in Rust Belt states such as Michigan, Ohio and Indiana. This result is not surprising. Rust Belt states have a large concentration of employment in the automotive industry, along with other manufacturing, and thus the exposure to robots is more pronounced, with increases ranging between 3.14 and 15.47 adjusted robots per thousand workers in many of the region's zones. On the other hand, in several states, such as those in the Great Plains and the Rocky Mountains, the exposure has been more limited, with increases ranging between 0.13 and 0.80 adjusted robots per thousand workers in many zones of those states.

How does this heterogeneity in the penetration of robots at the level of industry

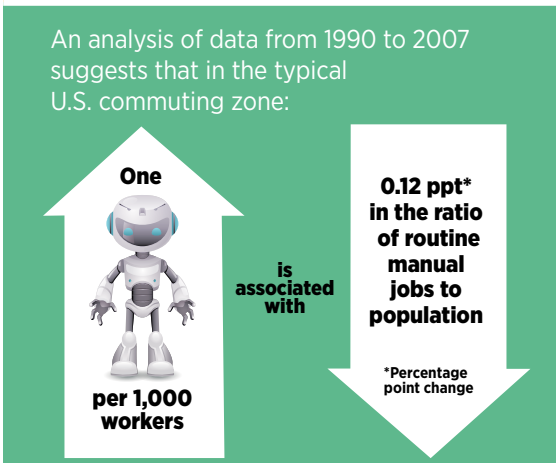
The robots aren't coming ... they're already here



SOURCES: International Federation of Robotics, U.S. Bureau of Labor Statistics and authors' calculations.



SOURCES: U.S. Bureau of Labor Statistics and authors' calculations.

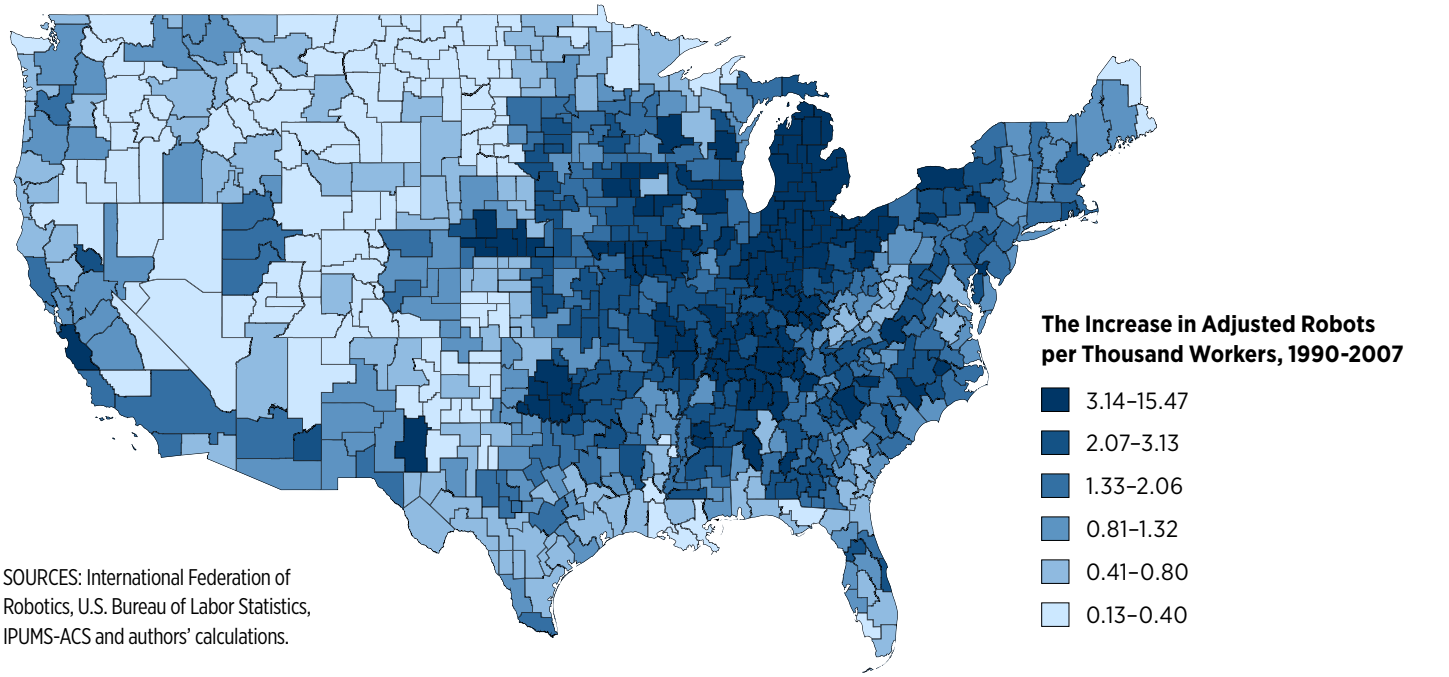


SOURCES: International Federation of Robotics, U.S. Bureau of Labor Statistics, IPUMS-ACS and authors' calculations.

ILLUSTRATION SOURCE: Meilun/iStock/Getty Images Plus

Figure 4

The Rising Exposure of Robots among Commuting Zones



SOURCES: International Federation of Robotics, U.S. Bureau of Labor Statistics, IPUMS-ACS and authors' calculations.

and geography translate into labor market effects? To answer this question, we studied the relationship between this exposure measure and labor market outcomes. In particular, we focused on the change in the employment-to-population ratio of routine manual employment between 1990 and 2007 for 722 commuting zones in the United States and how this change may be linked to the exposure to robots. We used data on industry employment and production from the U.S. Bureau of Labor Statistics.

Figure 5 shows the scatterplot of these two variables, with the regression line represented by the solid black line. Each bubble in the graph is a single U.S. commuting zone, which we link to a local labor market, and the bubble's size represents the size of the commuting zone in terms of employment in 1990.

The regression line shows a negative relationship between these variables, which implies that an increase in the exposure to robots by one unit per thousand workers is associated with a decline in the commuting zone's ratio of routine manual employment to population by around 0.12 percentage points.[6] In other words, the analysis suggests that the larger increase in the use of robots in

Figure 5

The Effects of Robots on Routine Manual Employment

SOURCES: International Federation of Robotics, the U.S. Bureau of Labor Statistics, IPUMS-ACS and authors' calculations.

NOTES: The figure represents the relationship between the changes in the number of robots per thousand workers (as given by our exposure measure) and in the ratio of routine manual employment to population from 1990 to 2007, after controlling for the effects of census divisions. Selected commuting zones are identified using the largest city in that commuting zone. The black line is the regression line. Each bubble in the graph is a single U.S. commuting zone.

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some commuting zones may be reducing the number of people employed in routine manual occupations relative to population in those commuting zones.

While the figure may paint a negative picture at first glance, it is important to highlight that from this figure alone we cannot pin down the aggregate effects of automation on employment. It may be possible that automation leads to an overall increase in employment, with the increase being lower in commuting zones with higher exposure to robots due to relatively fewer routine manual jobs. To be able to estimate the overall effects of increased automation and the increased use of industrial robots, we need to complement this analysis with additional information or an alternative methodology, which is beyond the scope of this article.

Conclusion

Employment in routine occupations has been constant or declining over the past few decades, and automation is believed to be one of the reasons for this structural shift in the labor market. The use of robots in production has been steadily increasing since the early 1990s in most advanced economies around the world, and we used a unique dataset with information on the stock of industrial robots at the level of industries to construct a measure for a commuting zone's exposure to robots.

Our analysis revealed a negative relationship between automation and routine manual employment in local labor markets, which supports the thesis that automation may be an important driver of polarization in the labor market.

While we focused on routine manual occupations in this article, automation could have an impact on a broader set of jobs. With advances in artificial intelligence and computerization, there are several cognitive skills, such as handwriting recognition and pretrial research, that already have been automated to a certain extent. Other cognitive skills, such as decision-making under challenging situations in intensive care units (ICUs), may soon be supplemented by algorithmic recommendations.[7] Thus, automation can have far-reaching consequences that may lead to structural shifts in the labor market. RE

(This article was published online July 10.)

ENDNOTES

[1] See, for example, Goos et al., Autor et al., and Autor and Dorn.
[2] See International Federation of Robotics.
[3] See, for example, Acemoglu and Restrepo, 2018 and 2019.
[4] We follow Foote and Ryan in our classification of occupations into four broad groups.
[5] We exclude from this analysis farming, fishing, forestry and military occupations.
[6] Our strategy differs from Acemoglu and Restrepo's in that they use the exposure to robots constructed from European data as an instrument for U.S. exposure, while we adopt a slightly simpler approach and directly use our measure for U.S. exposure in our analysis. If instead we were to follow Acemoglu and Restrepo's methodology using instrumental variables, our results would be similar to the ones in their paper, except that we use a different measure of employment changes, that is, routine manual employment.
[7] See Frey and Osborne.

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Better than Ever? The Wealth of Retired Households

By YiLi Chien and Qiuhan Sun

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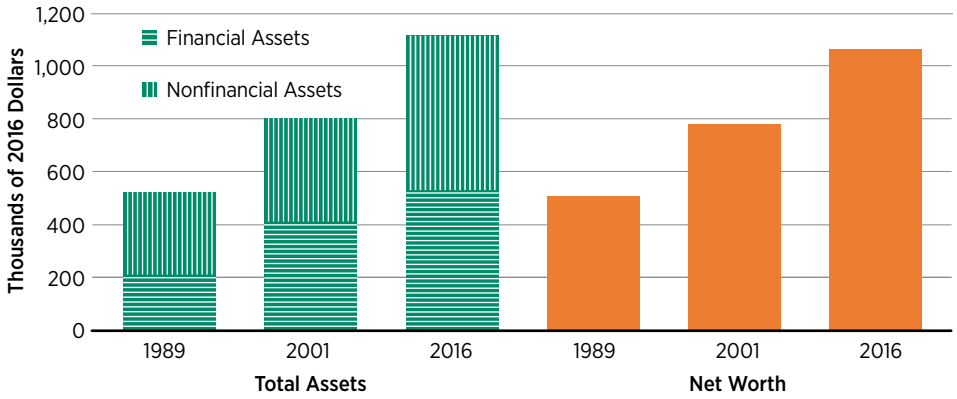
KEY TAKEAWAYS

- An analysis of U.S. data shows that the average retired household in 2016 had greater wealth than those in 2001 and 1989.
- Though wealth inequality has worsened, increased median wealth among current retired households indicates most retirees are benefiting from economic growth.
- Economic growth has allowed the most recent retirees to grow their nest eggs, though they may face eroding purchasing power due to rising medical costs.

Figure 1

The Changing Balance Sheet: Average Retired Household



SOURCES: Survey of Consumer Finances and authors' calculations.

NOTES: Data are for the average U.S. household with a head who is 65 or older in the survey year. The chart displays the household's total assets, which include financial and nonfinancial assets, as well as net worth, which is total assets less total debts. Financial assets include retirement accounts, and nonfinancial assets include a primary residence.

How financially fit are U.S. retirees? How has their financial position evolved over time? There has been a growing interest in these issues as aging baby boomers continue to retire. Some argue that the retirement situation is mixed for Americans, with many approaching retirement age with little or no retirement savings.[1]

This article offers a glimpse into the state of current retirees' household wealth compared with that of past retirees. To see how current retirees fare relative to previous cohorts, we compared the balance sheets of households headed by retirees in 2016 with those of households headed by retirees in 2001 and 1989.[2] We analyzed the composition of their assets and liabilities using household-level data from the Survey of Consumer Finances (SCF).[3]

Overall, our analysis indicates that the average value of asset holdings among retirees has more than doubled between 1989 and 2016 after adjusting for inflation. An increase in both financial assets, such as stocks and bonds, and nonfinancial assets, such as housing, contributed to the rise in assets among retirees. In terms of liabilities, retirees in 2016 were slightly more indebted on average than retirees in 1989, primarily due to larger holdings of mortgage debt.

U.S. economic growth has mainly driven this rise in wealth among retirees, which has also improved their standard of living. Moreover, inequality—as measured by the ratio between average and median total assets—has worsened over time although only slightly, suggesting that the majority of retirees still benefit from rising wealth resulting from economic growth.

Doubling Assets

The average value of total assets grew significantly among retirees from 1989 to 2016. As shown in Figure 1, retirees in 2016 held an average of $1.12 million worth of assets, while retirees in 1989 and 2001 held an average of $520,000 and $806,000 worth of assets, respectively.[4] In other words, retirees' assets more than doubled from 1989 to 2016.

This rise was driven by both financial and nonfinancial assets.[5] The value of retirees' financial assets grew from $217,000 in 1989, to $399,000 in 2001 and then to $538,000 in 2016. This means that the average financial asset position in 2016 was around $321,000 higher than in 1989 and $139,000 higher than in 2001. The rise of nonfinancial assets followed a similar pattern, increasing by $280,000 from 1989 to 2016 and by $175,000 from 2001 to 2016.

In terms of liabilities, 2016 retirees were also slightly more indebted on average than previous generations of retirees because of higher holdings of mortgage debt. The value of debt among retirees

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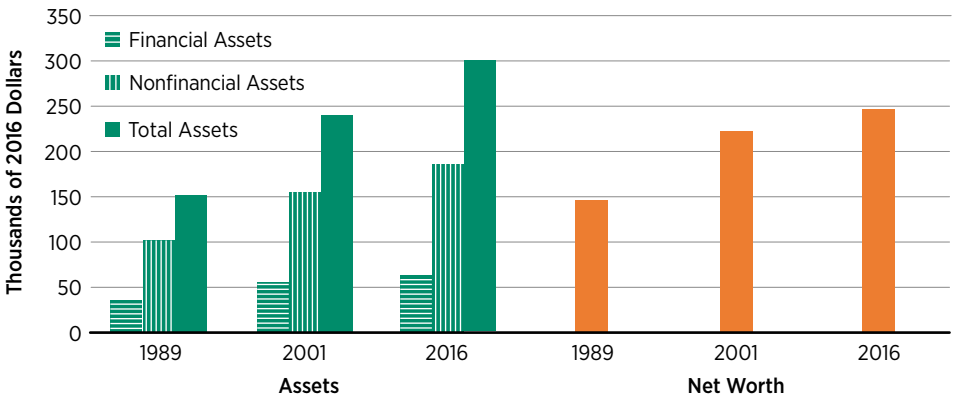
Figure 2

The Changing Balance Sheet: Median Retired Household



SOURCES: Survey of Consumer Finances and authors' calculations.

NOTES: Data are for the median U.S. household with a head who is 65 or older in the survey year. The chart displays the household's financial, nonfinancial and total assets, as well as net worth, which is total assets less total debts. Since these are median values, the sum of financial and nonfinancial assets does not necessarily equal total assets. Financial assets include retirement accounts, and nonfinancial assets include a primary residence.

grew from $11,000 in 1989, to $24,000 in 2001 and then to $51,000 in 2016 (not shown in Figure 1). However, the size of debt was relatively small compared to the size of assets.

Overall, we see that the average size of assets among retirees grew significantly over time, while the size of debt rose only slightly; thus, liabilities remained a smaller share of retirees' total assets. Ultimately, we see a considerable rise in average net worth among retirees, from $509,000 in 1989, to $782,000 in 2001 and to more than $1 million in 2016.

Long-term U.S. economic growth mostly drove this substantial increase in retirees' wealth. As the economy grows, aggregate assets accumulate over time, resulting in higher output and welfare. Retirees were not the only ones to benefit from economic growth, as the total population's average asset position nearly doubled during our sample period. Nevertheless, note that the value of assets more than doubled among retirees while only nearly doubling for the population as a whole. This implies that retirees' assets grew faster than the average, and that the rest of the population experienced slower asset growth.

Inequality Concern

Rising average wealth among retirees may not necessarily benefit everyone. As documented by economists Emmanuel Saez and Gabriel Zucman, wealth inequality is very significant in the U.S. and has worsened in recent decades. If wealth inequality among retirees also worsens over time, then wealth becomes more concentrated among a smaller fraction of retirees, which may prevent the majority of retirees from enjoying the benefits of economic growth.

To shed light on this issue, we calculated the median—instead of the average—of retirees' assets, liabilities and net worth over time. The results for assets and net worth are reported in Figure 2.

Median total assets among retirees also grew substantially, from $151,000 in 1989, to $240,000 in 2001 and to $301,000 in 2016. The median retiree held little to no debt throughout our sample period. Therefore, median net worth increased substantially from $145,000 in 1989 to $246,000 in 2016.

The increase in median total assets and net worth was large but still smaller than the rise in average assets and net worth reported in Figure 1. The slower increase in the median relative to the average indicates that wealth inequality worsened. Despite worsening wealth inequality, however, the large increase in median total assets signifies that the majority of retirees still benefit greatly from the increasing wealth induced by long-term economic growth.[6]

The Power of Economic Growth

The average and median inflation-adjusted wealth of retirees has been increasing over time. The rise is driven mostly by long-term economic growth. This is good news for future retirees, especially because Social Security taxes collected may someday be insufficient to pay the scheduled benefits. Our analysis demonstrates that economic growth can help alleviate retirement concerns by growing retirees' nest eggs.

The higher level of inflation-adjusted wealth should enable current retirees to improve their standard of living compared with that of previous cohorts of retirees. However, this conclusion is subject to a caveat: Retirees may face a higher-than-average inflation rate since their consumption tilts toward medical services, which have exhibited a faster pace of inflation in the past two decades. This could erode the purchasing power of their increasing wealth. RE

(This article was published online May 29.)

ENDNOTES

[1] See Chien and Morris.
[2] Retirees are defined as those survey households whose heads are 65 years or older in the survey year.
[3] The survey provides cross-sectional data on U.S. households' demographic characteristics, incomes, balance sheets and pensions every three years. The results reported in this article should represent the general state of the asset and liability positions of retired households.
[4] Note that all dollar numbers are inflation-adjusted to 2016 dollars and therefore can be compared directly. In this article, dollar amounts of $20,000 and greater have been rounded to the nearest $1,000.
[5] In the SCF data, the total household assets include the value of retirement accounts, which cover both defined benefit (DB) pension plans and defined contribution (DC) retirement plans. The significant shift of retirement plans from DB to DC (observed since 1980) should not affect our results.
[6] However, most of the increase may be due to homeowner's equity, which retirees could not easily use to cover living expenses.

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Observing the Earnings Gap through Marital Status, Race and Gender

By Makenzie Peake and Guillaume Vandenbroucke

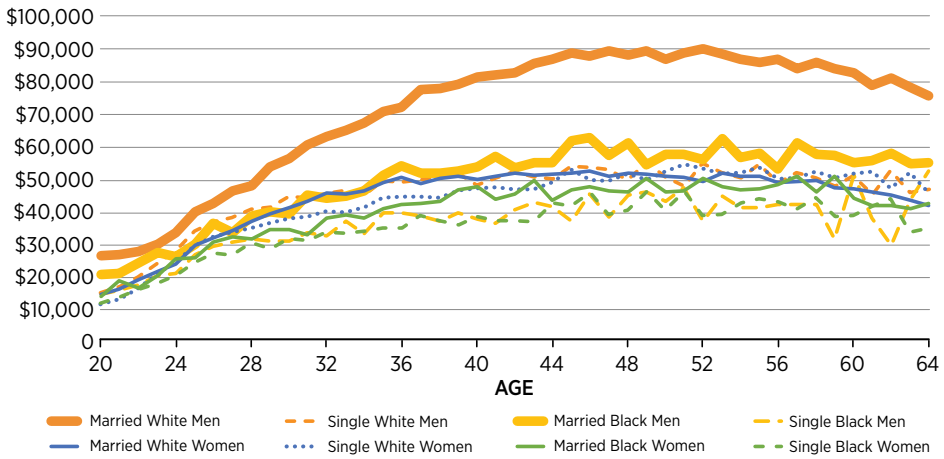
EKATERINA79/ISTOCK/GETTY IMAGES PLUS

KEY TAKEAWAYS

- Married men make the most in annual earnings when marital status across gender and race (black and white) is examined, according to an analysis of census data.
- When comparing usual hours worked across workers, married men work the most hours out of all groups considered, though this difference is slight.
- Married *white* men make the most of all groups when annual earnings and hourly earnings are compared, and this difference is large.

Figure 1

Annual Earnings by Marital Status, Race and Gender



SOURCE: IPUMS-USA, University of Minnesota.

NOTE: Data are for employed people with at least a high school diploma and for 2016.

The gender earnings gap is a well-known phenomenon. Perhaps less known is the fact that a significant portion of the gap is due to married men. In an *Economic Synopses* published by the Federal Reserve Bank of St. Louis in 2018, Guillaume Vandenbroucke highlighted the gap in earnings among married men on the one hand, and single men, single women and married women on the other hand.[1]

The breadth of the inequality in earnings between married men and the other three groups is only one aspect worth noting, though. What is even more remarkable is that workers among the other three groups tend to maintain similar earnings over their respective life cycles.

For what follows, it is useful to distinguish between what we refer to as "earnings"—that is, the total labor income received by a worker—and what is often referred to as "wages"—that is, the earnings per hours worked, or the hourly wage. The two concepts are related by the following equation:

$$\textit{Earnings} = \textit{(Hours Worked)} \times \textit{(Earnings per Hour)}$$

Our aim in this article is twofold. First, it is to extend the earlier analysis to distinguish across races (namely white and black). A 2017 report at the Federal Reserve Bank of San Francisco highlighted that the black-white wage gap remains important and "cannot be fully explained by differences in age, education, job type, or location." Our goal is not to "further explain" or "better explain" the black-white wage gap, however; instead, it is to point out the importance of marital status when thinking about earnings inequality between genders and races.

Our second objective is to decompose the earnings gap into two elements: a gap in hourly wages and a gap in hours worked. Understanding the difference between earnings and wages is essential to our analysis, since the earnings of two workers may differ because of their hourly wage or the number of hours they work per week. We demonstrate that, although married men tend to work longer hours, most of the earnings gap is due to their larger hourly wage.

We use labor earnings data from the American Community Survey, collected through IPUMS-USA, for the census year 2016 among employed people between ages 20 and 64 with at least a high school diploma. Figure 1 shows the data by age for blacks and whites, single[2] and married, and males and females.

The first point of note in this figure is that earnings increase with age up to a

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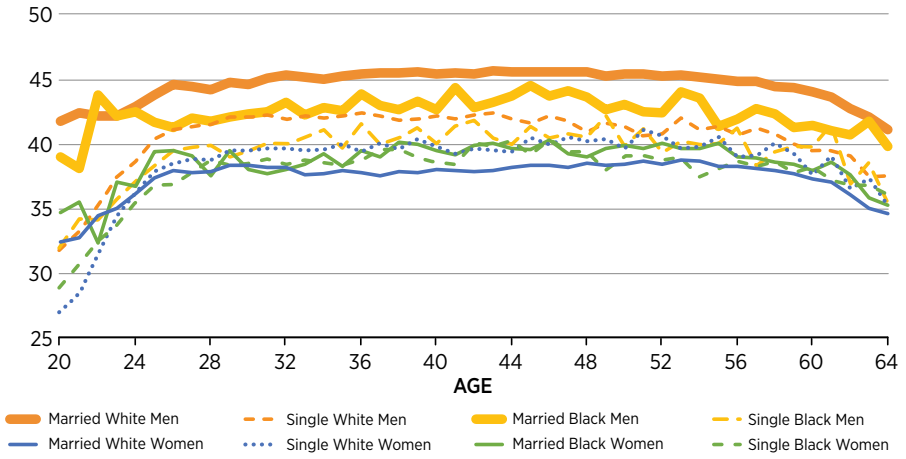
Makenzie Peake (right) is a research associate at the Federal Reserve Bank of St. Louis.

Figure 2

Usual Hours Worked Weekly by Marital Status, Race and Gender

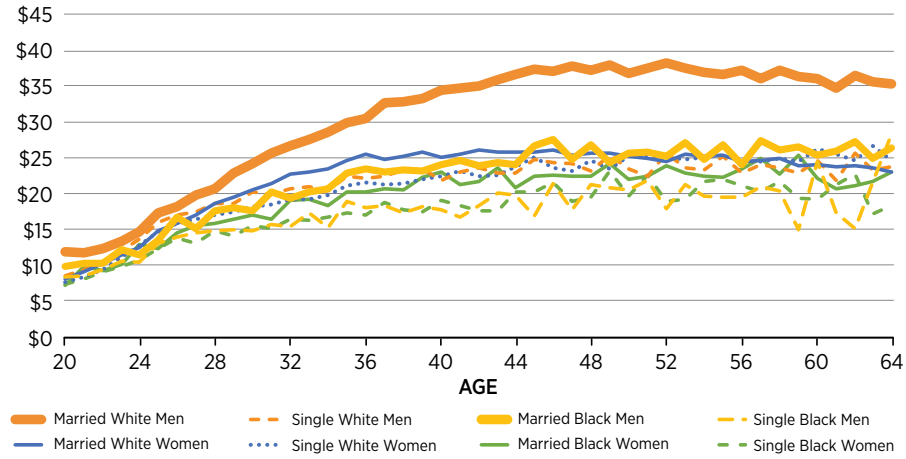


SOURCE: IPUMS-USA, University of Minnesota.

NOTES: Usual hours worked per week are the number of hours that respondents reported as being the amount that they usually worked each week, if the person worked during the previous 12 months. Data are for employed people with at least a high school diploma and for 2016.

Figure 3

Hourly Wage by Marital Status, Race and Gender



SOURCE: IPUMS-USA, University of Minnesota.

NOTE: Data are for employed people with at least a high school diploma and for 2016.

certain point, across all groups. The second point is that married men (the orange and gold solid lines) are earning more than the other groups. Yet, even though married men are among the highest earners, there exists a great disparity in wages between married white men (with average earnings peaking at $90,000) and all other groups, including married black men (with average earnings peaking at $62,000), who tend to make only slightly more on average than the other groups. A final observation is that single black men and single black women earn the least across all groups.

The earnings data plotted in Figure 1 are annual earnings. They comprise a combination of hours worked and hourly wages, as indicated earlier. In theory, therefore, it is possible that some workers receive higher earnings simply because they work longer hours. How much of the difference in annual earnings between married white males and the other groups is attributable to married white males working longer hours? To answer this question, we plot the usual hours worked per week by the same eight groups in Figure 2.[3]

Figure 2 displays the average of usual hours worked per week by each group of workers and by the group's age. Married white men work the longest hours, though the difference is slight, especially when compared to single white men and married black men.

We use the data from figures 1 and 2 to build Figure 3, which plots hourly wages across the eight groups of workers. The first observation is that married white males are making significantly more per hour compared with the other groups. This, combined with their longer hours, explains why their annual earnings are so high.

The second observation is that with the exception of married white men, the groups make around the same amount of money per hour of work. Contrary to the message of Figure 1, which indicates that married men earn more than other groups, the hourly wages of black married men do not stand out. Third, single black men and women are compensated the least of the eight groups.

Though we are not offering an explanation of the earnings gap, our findings should be viewed as an attempt to point the broader scope of research, as well as the public debate, in a specific direction by asking, Why are married white men earning so much more than everyone else? The key word here is "married." The analysis above shows that even though important differences in earnings among genders and races exist, the true outliers on the earnings scale are more evident by their marital status. In other words, Figure 3 shows that men and women do not differ much in their hourly wages provided they are single, and that black and white workers do not differ so much, provided they are married women.

It is important to note that although we are analyzing one year of data during which people are either single or married, it remains the case that one can choose to switch from single to married at some point in one's lifespan.[4] Given this information, one may wonder whether such a choice (to move from one relational status to the next) subsequently implies that one (specifically white men) would start to earn more as a result of getting married.

(continued on Page 23)

Industry Mix May Help Explain Urban-Rural Divide in Economic Growth

By Charles S. Gascon and Brian Reinbold

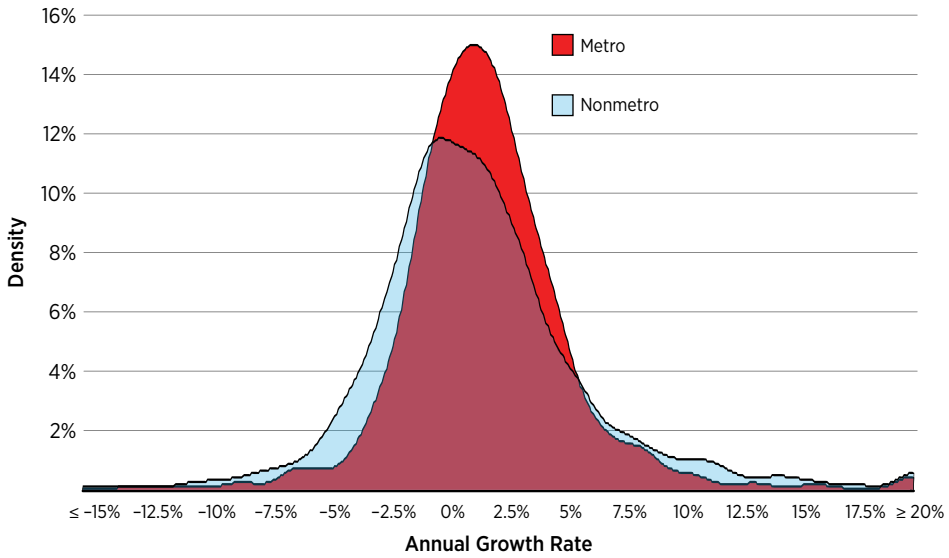
PEETERV/ISTOCK/GETTY IMAGES PLUS

KEY TAKEAWAYS

- The BEA recently released county-level GDP, thus providing another way to analyze differences between urban and rural areas in the U.S.
- Data suggest that rural areas have been growing more slowly because of greater exposure to the government sector and lower exposure to the private service-providing sector.
- The urban-rural divide appears greater in the Eighth District. This may be due to the composition of the District's goods-producing sector.

Figure 1

Average Real GDP Growth for U.S. Metro and Nonmetro Counties, 2012-15



SOURCES: Bureau of Economic Analysis and authors' calculations.

NOTES: Density is the probability that a county is found in a particular range of growth rates. For example, there is about a 15% probability that a metro county has a growth rate of around 1.25%, while there is about a 12% probability that a nonmetro county has a growth rate of around zero percent. A metro county is defined as a county that is part of a metropolitan statistical area.

Real gross domestic product (GDP), the measure of all goods and services produced in the economy, is often highlighted as the key measure of a region's economic performance. Estimates of real GDP are produced by the Bureau of Economic Analysis (BEA), which reports the estimates on a quarterly basis for the U.S. economy and U.S. states.

Recently, the BEA began releasing annual real GDP for U.S. counties. County-level GDP allows geographic comparisons of economic performance and, in this case, comparisons between urban and rural areas. To examine the urban-rural divide in economic growth, we have divided U.S. counties into two groups: counties that belong to metropolitan statistical areas (MSAs) and counties outside of MSAs (nonmetropolitan counties).[1]

MSAs are collections of counties that can generally be thought of as a city and its sprawling suburbs, whereas nonmetro counties are generally small towns and rural areas. That is not to say that counties belonging to MSAs do not have rural areas, but residents in those rural parts of an MSA are often employed in the urban areas. These two types of county clusters provide a succinct way to compare growth in urban (metro) areas and rural (nonmetro) areas.

Figure 1 plots the distribution of average annual real GDP growth rates for metro counties and nonmetro counties between 2012 and 2015.

A few points emerge from this figure. First, annual growth rates across nonmetro counties are more dispersed than those of metro counties. This can be seen by the lower peak and the fatter tails in the nonmetro distribution.

Second, distribution growth across metro areas exceeds nonmetro growth, with an average growth rate of 1.97% compared with 1.68% for nonmetro areas. The median values show greater divergence—1.70% (metro) and 1.18% (nonmetro). Furthermore, 75% of metro counties expanded, while only 64% of nonmetro counties expanded.

The Role of Industry Mix in Disparate Growth Outcomes

While there are many reasons to expect divergent economic performance between

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Table 1

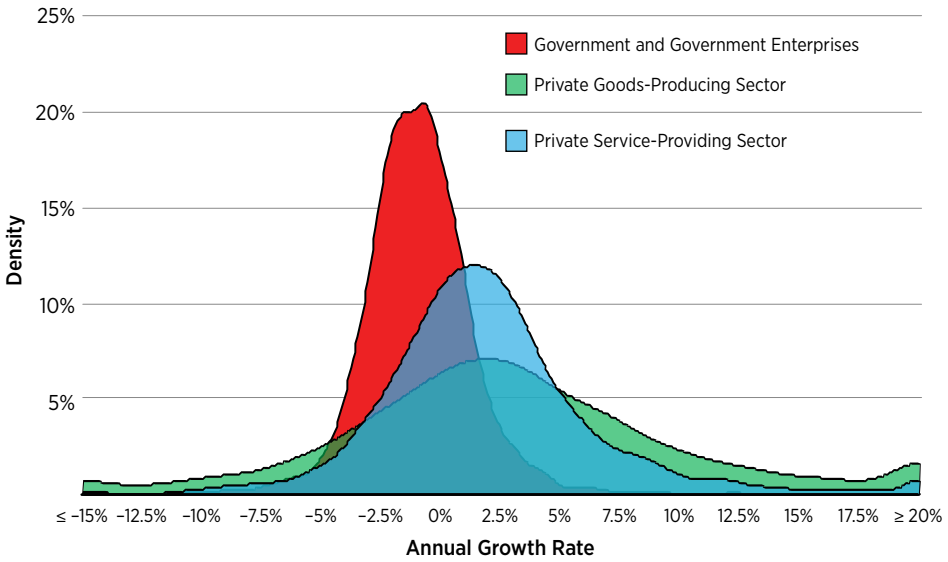
Composition of Average Real GDP by Sector: Metro and Nonmetro Counties

	U.S. Metro	U.S. Nonmetro	Eighth District Metro	Eighth District Nonmetro
Private Goods-Producing	17.9%	32.4%	20.0%	33.8%
Private Service-Providing	70.1%	51.9%	67.4%	51.5%
Government and Government Enterprises	11.9%	15.7%	12.5%	14.8%

SOURCES: Bureau of Economic Analysis and authors' calculations.

Figure 2

Average Real GDP Growth by Sector: U.S. Counties



SOURCES: Bureau of Economic Analysis and authors' calculations.

NOTE: Density is the probability that a county is found in a particular range of growth rates.

Around 70% of metro area real GDP comes from the private service-providing sector, while around 50% of nonmetro GDP comes from this sector.

urban and rural counties, one straightforward way to understand this difference is by looking at the industry mix between these two groups.[2]

Table 1 decomposes county-level real GDP into the three major sectors of the economy: private goods-producing, private service-providing, and government and government enterprises. Around 70% of metro area real GDP comes from the private service-providing sector, while around 50% of nonmetro GDP comes from this sector.

A key reason for this difference is due to what economists call agglomeration effects. In other words, firms (particularly service firms) experience greater productivity by locating in cities where they have easier access to resources like airports and large pools of consumers.

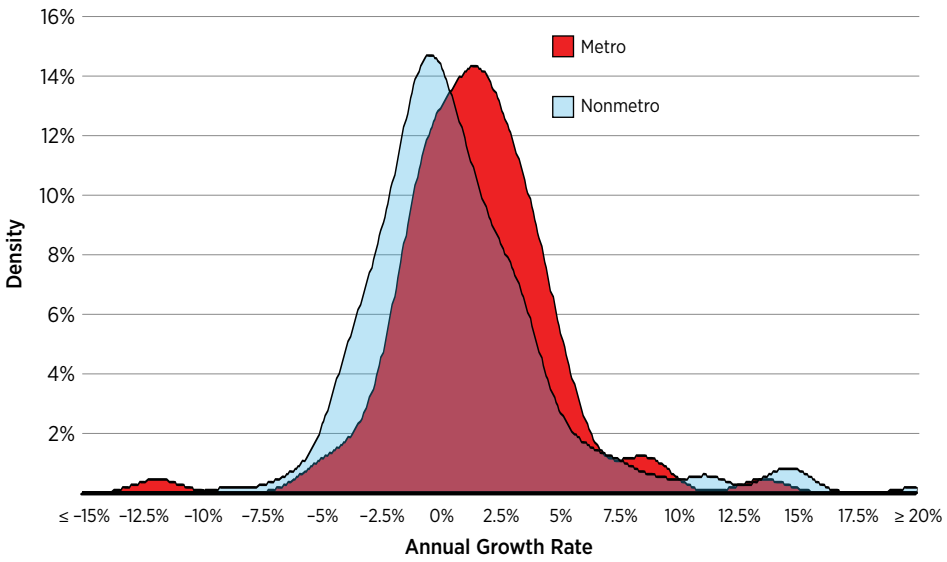
While improvements in technology may reduce these agglomeration benefits, in many instances they have increased those benefits. For example, urban hospitals can use a city's amenities to attract physicians and then utilize telemedicine to provide services to rural areas.

The effect is not only a greater share of overall real GDP but also a faster growth rate in metro counties. The median service-providing sector growth rate in metro counties was 2.12%, compared with 1.17% in nonmetro counties.

Another takeaway from Table 1 is that the public sector has a greater share of real GDP in nonmetro counties: Government

Figure 3

Average Real GDP Growth for Metro and Nonmetro Counties in Eighth District, 2012-15



SOURCES: Bureau of Economic Analysis and authors' calculations.

NOTES: Density is the probability that a county is found in a particular range of growth rates. A metro county is defined as a county that is part of a metropolitan statistical area.

accounts for 16% of output compared with 12% in metro counties. This difference also partially explains the slower growth in nonmetro areas, as real output in the government sector declined across most U.S. counties during this period. (See Figure 2.)

Lastly, notice in Figure 2 that the distribution of growth across the goods-producing sector is much flatter than the distribution of growth in the other two sectors. The greater dispersion of growth across nonmetro counties seen in Figure 1 can be attributed to the greater role of the goods-producing sector in these counties. (See Table 1.)

A Closer Look at the Eighth District

Within the Eighth Federal Reserve District,[3] metro-nonmetro divergent trends are more prevalent. Figure 3 shows the distribution of growth (similar to Figure 1) for only the counties in the District. The bimodal distribution is much more evident in Figure 3 than in Figure 1, and the nonmetro distribution is shifted to the left (that is, growth is more negative). The median growth rate of metro counties in the District is 1.38%, while the nonmetro median is only 0.17%. Also, 67% of metro counties expanded, while 52% of nonmetro counties expanded.

Looking again at Table 1, it is somewhat surprising that there is a wider gap in growth rates between metro and nonmetro counties in the District than in the nation since the industry sector shares are similar. In fact, the difference in same-sector shares between metro and nonmetro counties is less pronounced in the District than in the nation.

So what is going on? While the gap in service-sector shares between metro and nonmetro counties is narrower in the District, the gap in median performance is slightly wider: 1.46% growth for metro counties and 0.32% growth or nonmetro counties.

The goods-producing sector also plays a major role in explaining the divergent outcomes in the District. Nationally, the median growth rate in the goods-producing sector is about 2.42%, and this is essentially the same in both metro and nonmetro counties. This relatively fast rate of growth can primarily be attributed to strong performance of the energy sector during this period.

In the District, the goods-producing sector typically resembles traditional manufacturing and agribusiness. As such, the overall median growth rate was slower, at about 2.09%. Moreover, metro and nonmetro counties experienced divergent outcomes, with stronger growth (2.44%) in metro counties and slower growth (1.66%) in nonmetro counties.

Conclusion

We found that urban (metro) counties have grown faster than rural (nonmetro) counties in the U.S. from 2012 to 2015. Further, this disparity is greater in the District than in the nation.

There are some caveats to our analysis. First of all, the BEA's county GDP statistics are a prototype. The BEA will continue to incorporate new sources that could change our results. Also, this is only a four-year horizon, so one cannot extrapolate trends with so few data. However, our conclusion that rural areas grow more slowly than urban areas is corroborated by other studies. RE

(This article was published online June 21.)

ENDNOTES

[1] A metropolitan statistical area is an area associated with at least one urbanized area that has a population of at least 50,000. The MSA comprises the central county or counties containing the core, plus adjacent outlying counties having a high degree of social and economic integration, with the central county or counties as measured through commuting.

[2] See DiCecio and Gascon, and Boshara.

[3] Headquartered in St. Louis, the Eighth Federal Reserve District includes all of Arkansas and parts of Illinois, Indiana, Kentucky, Mississippi, Missouri and Tennessee.

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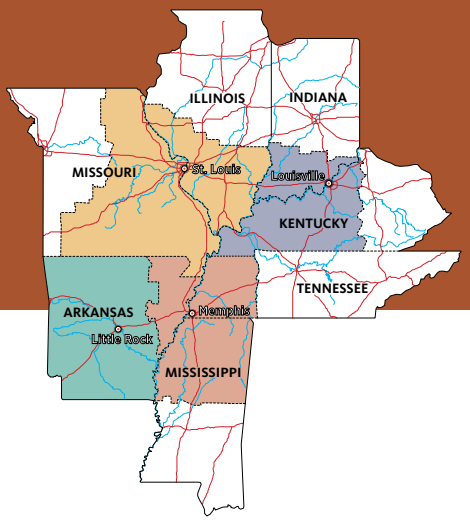
What Is Driving Student Debt in the Eighth District?

By Mahdi Ebsim and Julian Kozlowski



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

KEY TAKEAWAYS

- Concerns about student loan debt have grown as students incur greater burdens and take longer to repay this debt.
- Between 2013 and 2017, the average student debt in the Eighth District grew 17% in real terms versus 22% for the U.S.
- In the Eighth District, tuition is a more important driver of student debt than nontuition costs, like room and board, relative to the drivers of student debt in the U.S.

As student loan debt has risen to a level greater than credit card and auto debt, concerns have kept pace. There are worries across the nation that higher debt burdens on graduates can be financially detrimental and a deterrent to socially beneficial careers.

New York University, for example, made its medical school tuition-free for fear that higher debt burdens would deter students from becoming doctors. Last year, Michael Bloomberg, the billionaire and former New York City mayor, made the largest contribution ever to any higher-education institution in the U.S., donating $1.8 billion to Johns Hopkins University to be devoted exclusively to financial aid. Massachusetts state Senator Eric P. Lesser claims that "college debt is a monster that's ruining lives," and the White House has proposed federal student loan caps for graduate students and parents of undergraduates.[1]

Average student debt (i.e., the average balance per borrower in 2012 dollars) has grown to around $30,000 nationally. Between 2013 and 2017, student debt grew by 22%, while tuition (in 2012 dollars) grew by 9%. Thus, other forces besides tuition increases must be behind the increase in student debt.

In light of these concerns, it is important to see how student debt levels in the Eighth Federal Reserve District[2] compare with the national average to determine the severity of the debt burden, as well as to discuss what factors contribute to the differences in debt burdens across the District.[3]

Student Debt Levels

Average student debt is 14% lower in the Eighth District ($25,700 per borrower in 2012 dollars) than in the nation ($30,000). From 2013 to 2017, average student debt grew by 17% in the District versus 22% nationally. Over the same period, enrollment was mostly unchanged in the Eighth District and nationwide, while tuition increased by 12% in the District versus 9% nationwide.

We can decompose the increase in average student debt into tuition and nontuition-related borrowing, like room and board or other student expenses. It seems that only 5% of average student debt growth in the Eighth District cannot be attributed to increased tuition, compared with 13% for the aggregate economy. This seems to imply that *tuition is a relatively more important driver of student debt growth in the Eighth District,* and policies related to tuition reduction—like the NYU or JHU examples—can have particularly larger effects in reducing student debt in the District.

Student Loan Repayment

Student debt is lower in the District than in the nation, but this does not imply that it is a less severe problem. To gain more information on how hard it is for students to repay their debt, we can look at how long it takes to repay the loans.

Average repayment length is 11.6 years in the District, while it is 12.2 years nationwide. In fact, every state in the District boasts repayment lengths shorter than the national average. From 2013 to 2017, repayment lengthened by about seven months in the District and 17 months across the country.

Are the Recent Dynamics Good or Bad Symptoms?

The lengthening of repayment periods and the increase in student debt—both in the nation and in the District—can be symptoms of two opposite scenarios.

Bad Symptoms

On the one hand, they can be "bad symptoms," implying that:

- It's becoming more costly to invest in education, so students have to borrow more.
- It's becoming more difficult to repay the debt, so students are taking longer to repay the debt. This can be the case if, for example, there are lower returns to education.

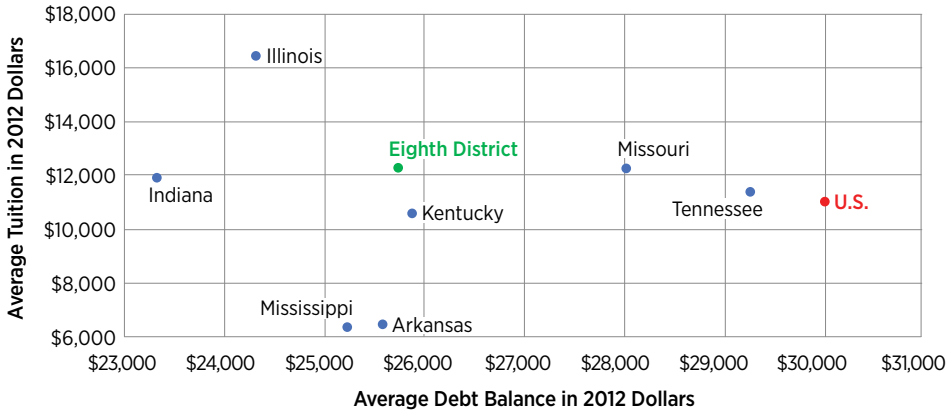
ABOUT THE AUTHORS

Julian Kozlowski (left) is an economist at the Federal Reserve Bank of St. Louis. His research focuses on macroeconomics and finance. He joined the St. Louis Fed in 2018. Read more about the author and his research at https://research.stlouisfed.org/econ/kozlowski.

Mahdi Ebsim (right) is a research associate at the Federal Reserve Bank of St. Louis.

Figure 1

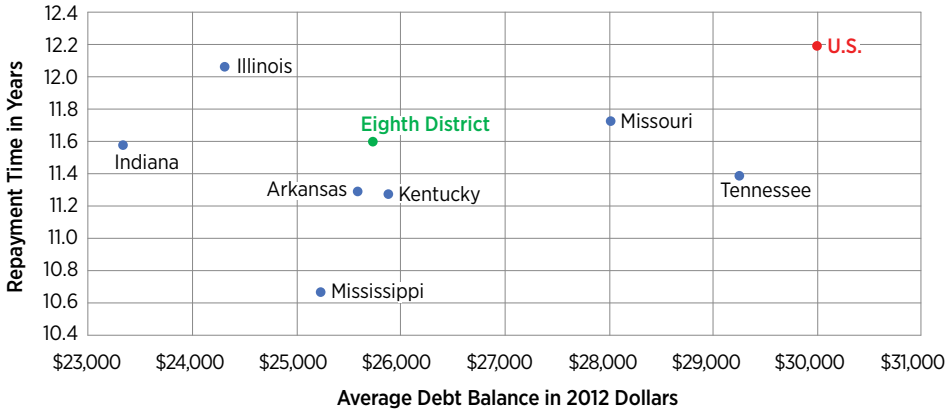
Student Debt: Tuition vs. Debt Burden in 2017



SOURCES: Federal Reserve Bank of New York/Equifax Consumer Credit Panel, Integrated Postsecondary Education Data System (IPEDS) and authors' calculations.

Figure 2

Student Debt: Repayment Time vs. Debt Burden in 2017



SOURCES: Federal Reserve Bank of New York/Equifax Consumer Credit Panel and authors' calculations.

Good Symptoms

On the other hand, higher debt and longer repayment can be "good symptoms." Consider these:

- Improvements in credit access for students can allow them to borrow more and roll their balances over for longer periods.
- An increase in the return to education, together with well-functioning credit markets, allows students to bring future income to earlier stages of their lives, thereby smoothing consumption.

Therefore, one has to be cautious when interpreting statistics alone. More research is needed to separate these two opposite forces and better understand student debt. Below we show that there are significant variations in student debt, repayment and tuition across states of the Eighth District. Perhaps, future research can exploit these cross-sectional variations to try to disentangle good and bad symptoms of student debt.

Student Loans and Eighth District States

The next figures show the relationships between student debt, tuition and repayment length across District states and the U.S.

Missouri and Tennessee

Colleges in Missouri charge higher tuition than the national average, and students take longer to repay relative to students in all other states in the District except Illinois.

However, students residing in Missouri had smaller average debt balances in 2017 compared with the national average. In fact, average debt growth between 2013 and 2017 in Missouri was 6 percentage points slower than the nation's.

From Figures 1 and 2, we note the similarity in tuition and average debt between Tennessee and Missouri. The difference between the two states is in repayment period. Missouri students take a bit longer to repay (11.7 years) versus students in Tennessee (11.4 years). This difference may stem from the higher absolute enrollment in Missouri, which may result in many more high-balance students.

Mississippi, Arkansas and Kentucky

Mississippi and Arkansas are quite similar in everything but repayment. Figure 1 shows that both pay 40% lower tuition than the national average. Also, the debt burden of around $25,500 is still significant and only 15% lower than the national average.

Enrollment in Mississippi and Arkansas is comparatively lower than in the rest of the U.S. Those who repaid loan balances in 2017 did so almost a year quicker in Mississippi than in Arkansas, maybe due to a better environment for earnings: The quicker repayment for similar debt balances and average tuition suggests that labor market outcomes for graduates in Mississippi are relatively better than for graduates in Arkansas, all other things constant.

Kentucky can also be grouped with Mississippi and Arkansas. In Figures 1 and 2, Kentucky is consistently with Arkansas and Mississippi in the bottom half, below District and national averages. This reflects commonalities in borrowing behavior for education.

Illinois and Indiana

Illinois has 50% higher tuition but 20% lower average debt burden than the national averages. However, repayment is the longest (12 years) among the District states, as seen in Figure 2, and Illinois experienced the slowest growth in average debt since 2013, at 9%.

Indiana students pay similar tuition to the national average but have 20% smaller debt balances per borrower. It is important to note that Indiana experienced tuition

(continued on Page 23)

U.S. GDP Shows Surprising Strength, But Challenges Remain

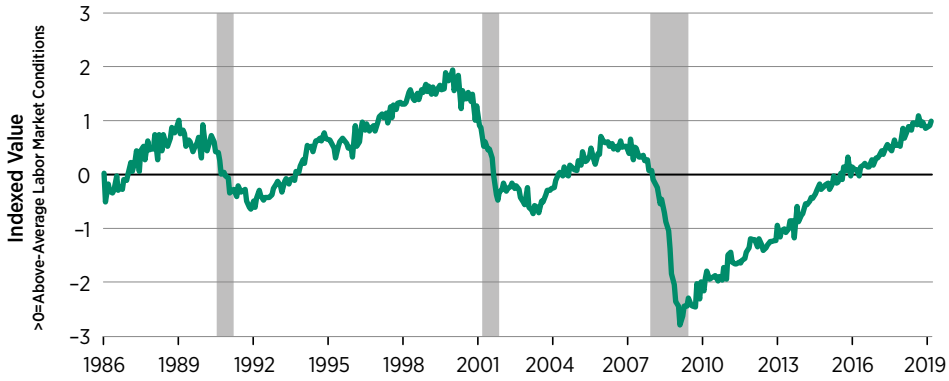
By Kevin L. Kliesen

INDUSTRYVIEW/ISTOCK/GETTY IMAGES PLUS

KEY TAKEAWAYS

- U.S. real GDP growth surprised to the upside in the first quarter of 2019. But some key data have been mixed, and the U.S.-China trade dispute remains a wild card.
- Continued strength in the U.S. job market and an upswing in labor productivity are positive developments.
- Rebounding crude prices firmed up inflation in March and April, but forecasters still see inflation averaging 2% over the next 10 years.

St. Louis Fed Labor Market Index



SOURCE: Author's calculations.

NOTES: The index is estimated using 13 labor market variables and principal components analysis, similar to the construction of the St. Louis Fed Financial Stress Index. Shaded areas indicate U.S. recessions.

U.S. real gross domestic product (GDP) growth surprised to the upside in the first quarter of 2019, after posting its strongest rate of growth in more than a dozen years in 2018. The stronger-than-expected start to the year caused some forecasters to pencil in faster real GDP growth in 2019.

Still, some key economic data have been mixed, and a few models are showing elevated recession probabilities over the next four quarters. By contrast, labor market conditions, which are a usually reliable indicator of cyclical strength or weakness, continue to show scant evidence that firms are preparing for a sales slowdown.

One wild card is the ongoing trade dispute with China, which has rattled financial market participants in both countries and elevated measures of business uncertainty. On balance, though, the sentiment in financial markets remains mostly bullish. A key reason is that the latest projections by the Federal Open Market Committee (FOMC) now show the likelihood of no further rate hikes in 2019.

Healthy Labor Markets and Strong Productivity

The pace of U.S. economic activity was stronger than expected in the first quarter; real GDP rose at a 3.2% annual rate, according to the advance estimate. This increase was more than twice the rate predicted by the forecast consensus in the March 2019 *Survey of Professional Forecasters* and 1 percentage point more than the modest growth registered in the fourth quarter of 2018. However, the underlying details of the first-quarter report were a bit softer, as growth of consumption spending and business fixed investment slowed measurably from the previous quarter. Notably, inventory investment also strengthened, so that the growth of final sales (real GDP less inventory investment) was modestly slower (2.5%) than the top-line growth rate.

Gauging the pace of economic activity over the near term is challenging for a couple of reasons. First, ongoing geopolitical developments have helped to keep measures of economic policy uncertainty at elevated levels. When uncertainty is high and rising, this tends to have a depressing effect on business capital expenditures and consumer durable goods purchases.

Second, some of the key economic indicators have been mixed, with seemingly every strong number offset by a weak number. For example, retail sales surged in March, but light-vehicle sales fell sharply in April. Similarly, new orders for manufactured durable goods rose sharply in March, but industrial production unexpectedly fell slightly in the same month. Private construction outlays fell sharply in March, but new home sales have risen sharply for three straight months. Available data for April also depict a mixed bag of good and not-so-good economic conditions.

Still, there have been other positive developments that portray solid economic fundamentals. Importantly, labor market conditions remain strong. In April, payroll employment rose by a stronger-than-expected 263,000 jobs, and the unemployment rate fell 0.2 percentage points to 3.6%. Moreover, job openings remain near historic highs and continue to exceed the number of those unemployed and actively seeking work. As noted in the accompanying figure, a broad measure of labor market

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conditions shows no signs that firms are poised to materially reduce staffing levels.

Another exceptionally positive development has been the marked upswing in labor productivity. In the first quarter of 2019, output per hour in the nonfarm business sector was up by an impressive 2.4% from a year earlier—its largest increase in eight and a half years. If this strong productivity growth persists, forecasters and policymakers will need to revisit their medium-term real GDP growth forecasts.

Oil Prices Rebound, Inflation Follows

Sharp declines in crude oil prices over the second half of 2018 triggered a substantial moderation in headline inflation pressures that spilled over to early 2019. In the first quarter of 2019, the Fed's preferred price index—the personal consumption expenditure price index (PCEPI)—was up 1.4% from a year earlier, the smallest increase in a little more than two years. By contrast, other inflation measures are closer to the FOMC's 2% inflation target. For example, the year-over-year change in the Dallas Fed's trimmed-mean PCEPI inflation rate was 2% in March and 1.9% in the first quarter of 2019.

Owing to a rebound in crude oil prices in 2019, headline inflation firmed in March and April. As a result, the total consumer price index (CPI) has increased at a 2.7% annual rate over the first four months of 2019—a modest acceleration from the same period a year earlier (2.5%). Although market-based measures of long-term inflation expectations have seesawed this year, they remain near 2% and up slightly since the end of 2018. For their part, professional forecasters still expect PCEPI inflation to average 2% over the next 10 years. RE

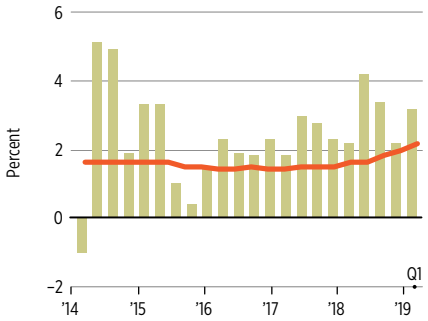
Kathryn Bokun, a research associate at the Bank, provided research assistance.

(This article was published online May 23.)

ECONOMY AT A GLANCE

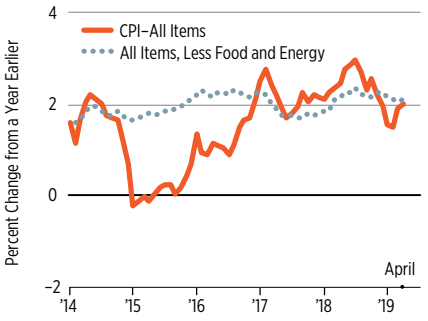
All data as of May 10, 2019

Real GDP Growth

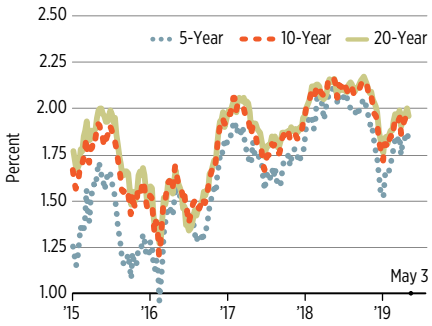


NOTE: Each bar is a one-quarter growth rate (annualized); the red line is the 10-year growth rate.

Consumer Price Index (CPI)

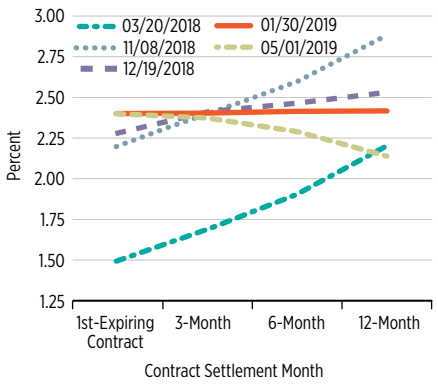


Inflation-Indexed Treasury Yield Spreads

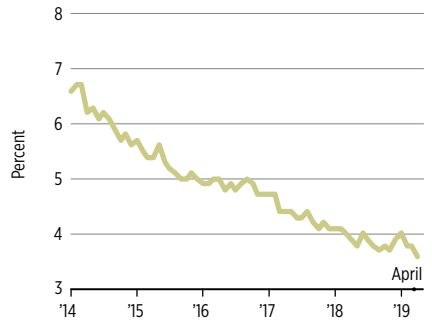


NOTE: Weekly data.

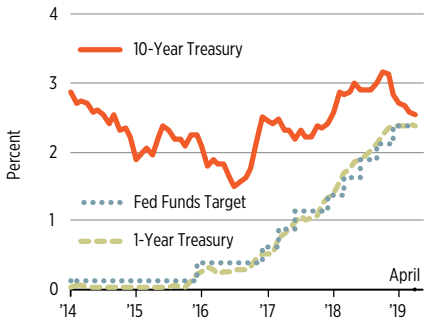
Rates on Federal Funds Futures on Selected Dates



Civilian Unemployment Rate

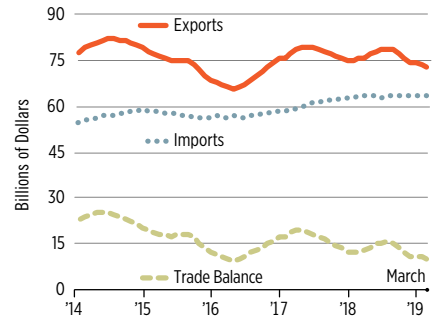


Interest Rates



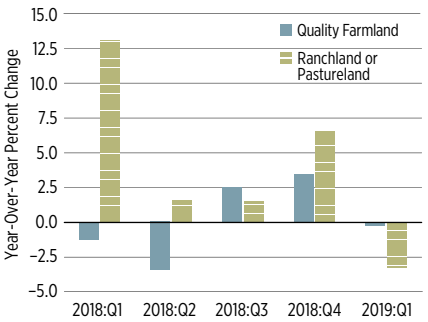
NOTE: On Dec. 16, 2015, the FOMC set a target range for the federal funds rate of 0.25% to 0.5%. The observations plotted since then are the midpoint of the range (0.375%).

U.S. Agricultural Trade



NOTE: Data are aggregated over the past 12 months.

Average Land Values Across the Eighth District



SOURCE: Agricultural Finance Monitor.

On the web version of this issue, 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.

Earnings Gap

(continued from Page 15)

In other words, does marriage make white men more productive? Or could it be that more-productive white men are more likely to marry than less-productive white men? Answers to these questions are beyond the scope of this paper, but answering them in the future will be useful for further understanding inequality in the U.S. RE

(This article was published online May 8.)

ENDNOTES

[1] See Vandenbroucke, 2018.
[2] It is important to note that the category "single" refers to people who have never been married. We do not consider separated, divorced or widowed people in our analysis.
[3] Usual hours worked per week reports the number of hours per week that a respondent to the census questionnaire usually worked, if the person worked during the previous 12 months.
[4] To be precise, it is possible that an individual can marry during the course of a single year. Though we chose to abstract this issue from our calculations, it is possible to restrict the sample to only married people who did not get married in the past year.

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Daly, Mary C.; Hobijn, Bart; and Pedtke, Joseph H. "Disappointing Facts about the Black-White Wage Gap." Federal Reserve Bank of San Francisco, *FRBSF Economic Letter*, No. 26, Sept. 5, 2017. See www.frbsf.org/economic-research/publications/economic-letter/2017/september/disappointing-facts-about-black-white-wage-gap.

Vandenbroucke, Guillaume. "Married Men Sit Atop the Wage Ladder." Federal Reserve Bank of St. Louis *Economic Synopses*, No. 24, Sept. 13, 2018. See https://research.stlouisfed.org/publications/economic-synopses/2018/09/14/married-men-sit-atop-the-wage-ladder.

Student Debt

(continued from Page 20)

growth of 7% versus 12% for District states over the period 2013 to 2017. Besides relatively stable tuition, undergraduate enrollment is average compared with the youth population, and so is repayment.

Conclusion

As in the rest of the nation, student loan debt has increased in the Eighth District. This increase has also been coupled with increases in tuition.

However, these changes in the Eighth District come with significant heterogeneity, as shown in the figures for individual states. Where average tuition is similar but average debt is different, we could expect to observe differences in access to credit or returns to education across states. This is a crucial next step in this research.

Moreover, for states with similar levels of debt and tuition but different repayment rates, we ought to be concerned about what drives the different outcomes for students in different states receiving a similar level of education.

We conclude that the increase in student debt in the Eighth District is more linked to rising tuition than it is in the rest of the country, and policies related to relaxing tuition burdens—such as the NYU example—can be beneficial for the District. RE

(This article was published online June 25.)

ENDNOTES

[1] See Hackman and Mitchell.
[2] Headquartered in St. Louis, the Eighth Federal Reserve District includes all of Arkansas and parts of Illinois, Indiana, Kentucky, Mississippi, Missouri and Tennessee.
[3] Our analysis uses the Federal Reserve Bank of New York/Equifax Consumer Credit Panel. This is used to estimate the average student loan balance (total balance divided by number of borrowers in the panel) and repayment length (average of estimated time for a borrower to pay off the balance). The Integrated Postsecondary Education Data System (IPEDS) from the Education Department provides state-level data on total fall enrollment and tuition for full-time undergraduates, excluding less than two-year institutions. Average tuition is weighted by total fall enrollment. The figures discussed summarized data from 2017. Debt balances do not identify where a student attended school. However, 81% of students remain students in their home state, according to Table 309.10 in the 2017 Digest of Education Statistics.

REFERENCE

Hackman, Michelle; and Mitchell, Josh. "Trump Administration Proposes Borrowing Limits for Some Student Loans." *The Wall Street Journal*, March 18, 2019.

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Dr. Carmen Reinhart presented "A Short Tour of Global Risks" at the annual lecture on June 25, 2019. An expert in international economics, Reinhart co-authored one of the most definitive books on financial crises, called *This Time Is Different: Eight Centuries of Financial Folly.* She is a prominent voice in policy debates in the U.S. and around the world, and twice was named one of the 50 most influential people by *Bloomberg Markets* magazine.

She is the Minos A. Zombanakis Professor of the International Financial System at the Harvard Kennedy School. Based on publications and scholarly citations, she ranks No. 1 among the female economists in the Research Papers in Economics (RePEc) database.

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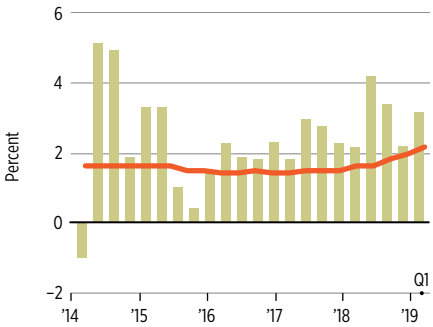
ECONOMY AT A GLANCE

Data as of May 10, 2019.

RE REGIONAL ECONOMIST
SECOND QUARTER 2019 | VOL. 27, NO. 2

Real GDP Growth



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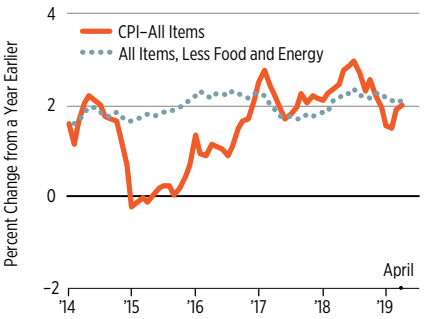
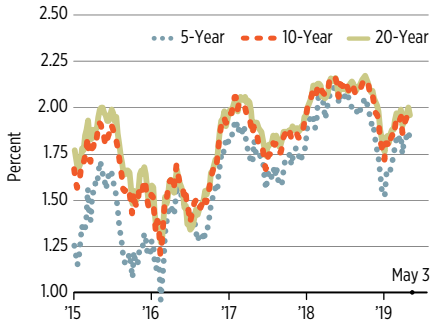
Consumer Price Index (CPI)

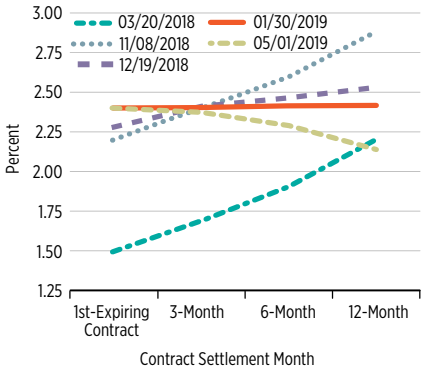


Inflation-Indexed Treasury Yield Spreads

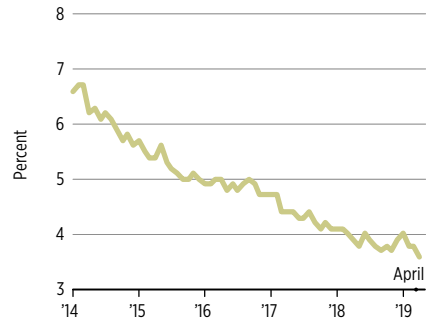


NOTE: Weekly data.

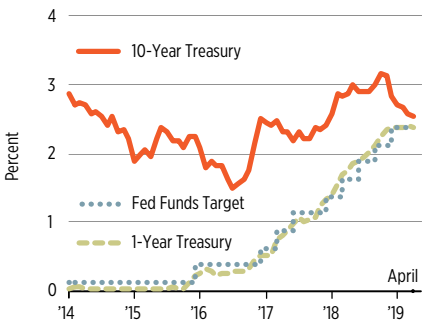
Rates on Federal Funds Futures on Selected Dates



Civilian Unemployment Rate

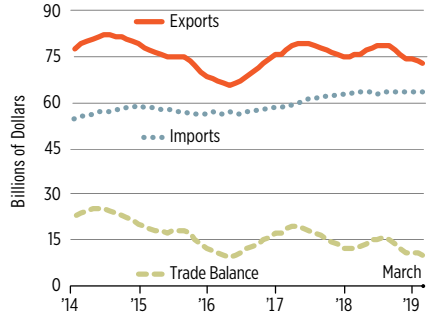


Interest Rates



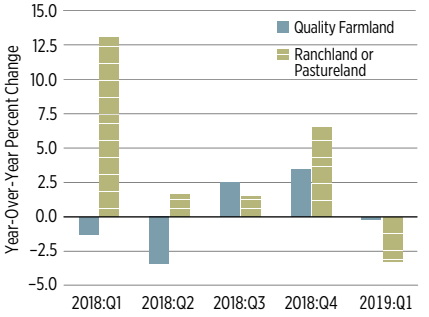
NOTE: On Dec. 16, 2015, the FOMC set a target range for the federal funds rate of 0.25 to 0.5 percent. The observations plotted since then are the midpoint of the range (0.375 percent).

U.S. Agricultural Trade



NOTE: Data are aggregated over the past 12 months.

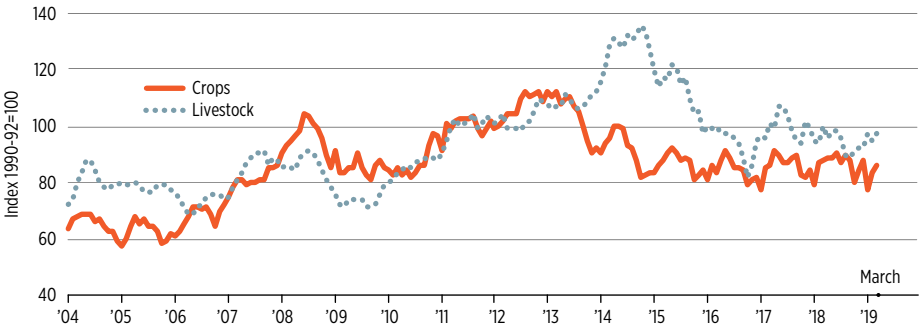
Average Land Values across the Eighth District



SOURCE: Agricultural Finance Monitor.

Data as of May 10, 2019, for crop and livestock prices. Bank data as of June 5, 2019.

U.S. Crop and Livestock Prices

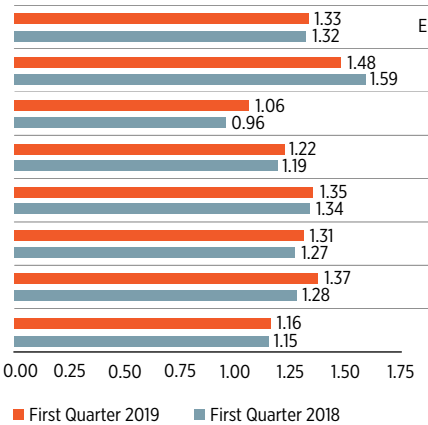


COMMERCIAL BANK PERFORMANCE RATIOS

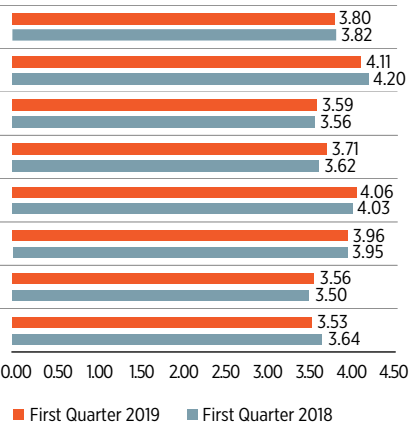
U.S. Banks by Asset Size/First Quarter 2019

	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*	1.35	1.16	1.13	1.24	1.20	1.30	1.26	1.37
Net Interest Margin*	3.36	3.95	3.94	3.92	3.93	3.90	3.91	3.25
Nonperforming Loan Ratio	0.95	0.98	1.02	0.78	0.86	0.76	0.80	0.99
Loan Loss Reserve Ratio	1.21	1.34	1.35	1.27	1.30	1.04	1.14	1.23

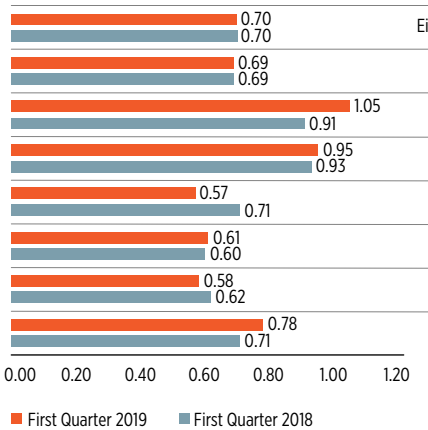
Return on Average Assets*



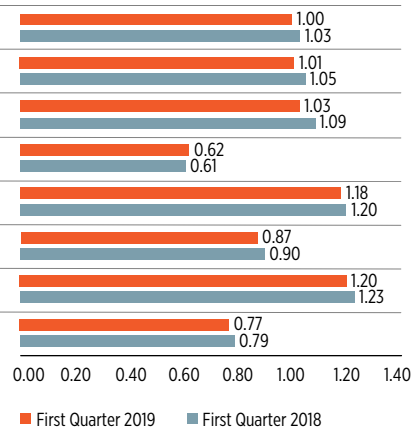
Net Interest Margin*



Nonperforming Loan Ratio



Loan Loss Reserve Ratio



SOURCE: Federal Financial Institutions Examination Council Reports of Condition and Income for all Insured U.S. Commercial Banks.

NOTE: Data include only that portion of the state within Eighth District boundaries.

*Annualized data.

For additional banking and regional data, visit our website at https://fred.stlouisfed.org.

REGIONAL ECONOMIC INDICATORS

Data as of May 10, 2019.

Nonfarm Employment Growth/First Quarter 2019

Year-over-Year Percent Change

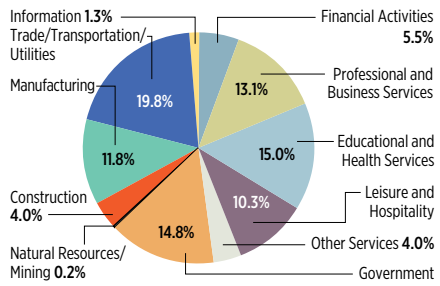
	United States	Eighth District †	Arkansas	Illinois	Indiana	Kentucky	Mississippi	Missouri	Tennessee
Total Nonagricultural	1.8%	1.1%	0.9%	1.0%	1.2%	1.2%	0.7%	0.7%	2.0%
Natural Resources/Mining	7.2	1.3	–2.3	–0.9	0.6	8.2	–2.0	0.8	0.0
Construction	3.9	1.2	1.2	–0.5	6.3	4.0	–1.8	–2.2	NA
Manufacturing	2.0	1.6	2.4	1.7	0.7	1.2	1.0	2.9	2.2
Trade/Transportation/Utilities	1.1	0.8	0.7	0.9	0.4	0.7	0.2	0.0	1.8
Information	–0.3	–2.3	–2.1	–3.2	–5.0	–0.6	–1.8	–1.3	–0.7
Financial Activities	1.2	1.2	1.3	1.6	–0.5	1.1	–0.5	–0.2	3.4
Professional & Business Services	2.5	0.9	–0.7	0.8	1.7	0.2	2.0	0.8	1.1
Educational & Health Services	2.3	1.9	1.0	1.6	3.6	3.6	1.3	2.0	0.2
Leisure & Hospitality	2.7	2.1	1.9	1.9	–0.1	0.6	3.0	1.6	5.3
Other Services	1.5	0.9	0.9	1.1	1.4	1.6	0.0	–1.7	2.2
Government	0.5	0.3	0.5	0.2	0.1	–0.3	0.0	0.1	1.4

† Eighth District growth rates are calculated from the sums of the seven states. Each state's data are for the entire state even though parts of six of the states are not within the District's borders.

Unemployment Rates

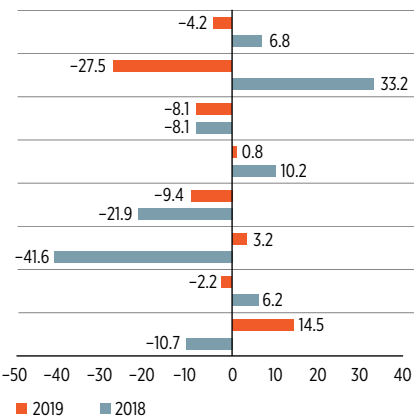
	2019:Q1	2018:Q4	2018:Q1
United States	3.9%	3.8%	4.1%
Arkansas	3.7	3.7	3.8
Illinois	4.3	4.3	4.4
Indiana	3.5	3.5	3.3
Kentucky	4.1	4.3	4.3
Mississippi	4.8	4.7	4.9
Missouri	3.2	3.1	3.5
Tennessee	3.2	3.3	3.6

District Employment by Industry—2018



Housing Permits/First Quarter

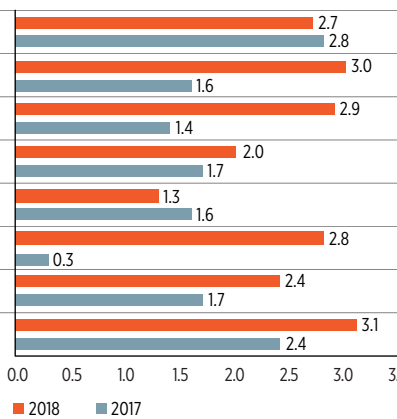
Year-over-Year Percent Change in Year-to-Date Levels



NOTE: All data are seasonally adjusted unless otherwise noted.

Real Personal Income/Fourth Quarter

Year-over-Year Percent Change



NOTE: Real personal income is personal income divided by the personal consumption expenditures chained price index.