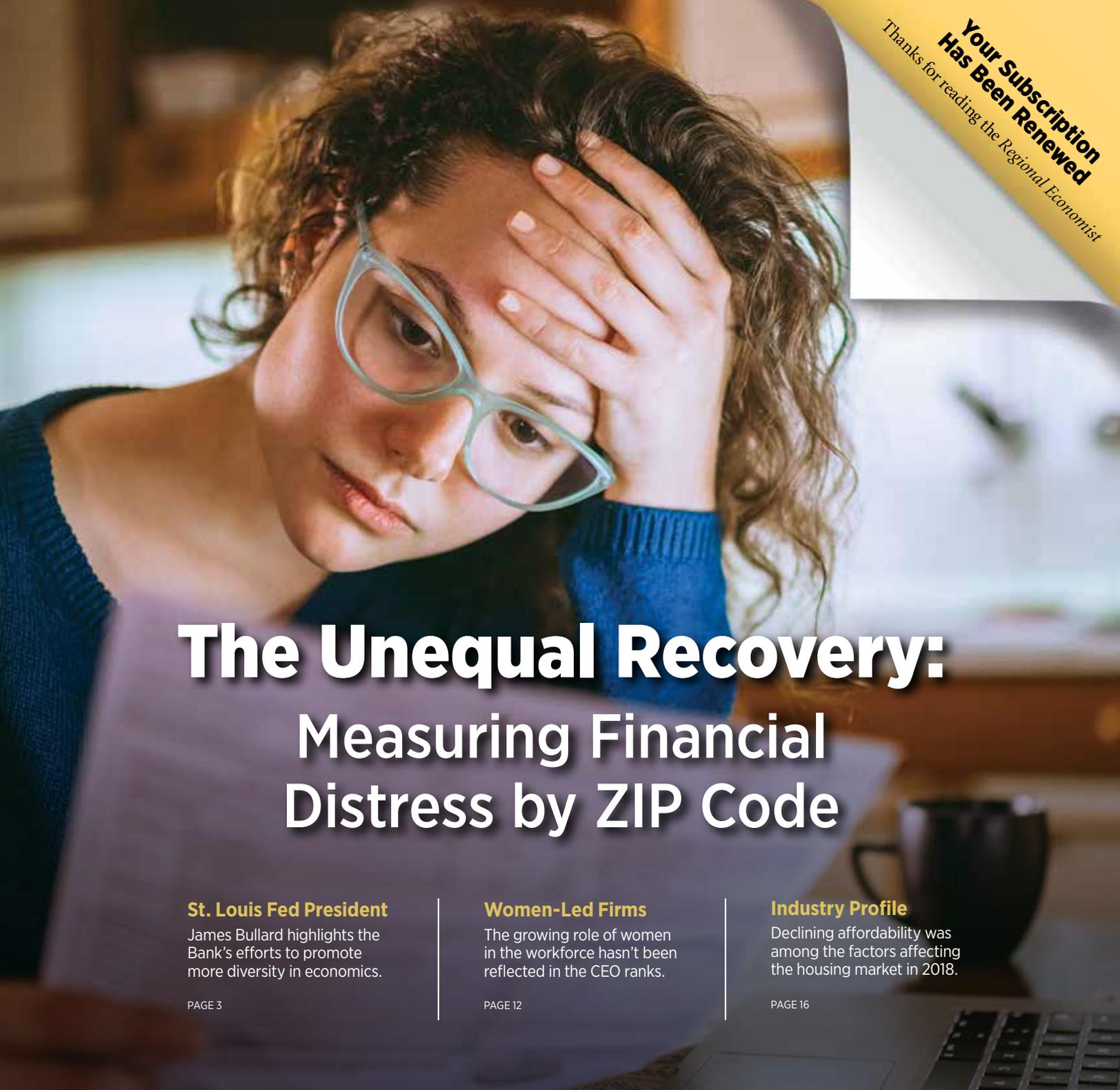


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The Unequal Recovery: Measuring Financial Distress by ZIP Code

St. Louis Fed President

James Bullard highlights the Bank's efforts to promote more diversity in economics.

PAGE 3

Women-Led Firms

The growing role of women in the workforce hasn't been reflected in the CEO ranks.

PAGE 12

Industry Profile

Declining affordability was among the factors affecting the housing market in 2018.

PAGE 16

RE

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IN THIS ISSUE

4

The Unequal Recovery: Measuring Financial Distress by ZIP Code

Since 2010, the U.S. economic recovery hasn't been the same for everyone. Starting in 2015, households in the poorest ZIP codes appear to have become more financially vulnerable in the event of a downturn in housing prices.



PRESIDENT'S MESSAGE 3

Female-Led Firms: Trends and Differences Relative to Male-Led Firms

Despite women's growing role in the workforce, the share of firms led by female CEOs was relatively stable from 2000 to 2014. 12

Changing Trade Relations May Affect U.S. Auto Exports in Long Run

The proposed trade agreement USMCA and trade disputes with China may have an impact on the U.S. auto sector. 14

INDUSTRY PROFILE

Slowing U.S. Housing Sector Still Shaped by Great Recession

The lingering effects of the recession, declining affordability and other factors have affected the housing market. 16

DISTRICT OVERVIEW

Debt Levels Continue to Grow in Eighth District's Key Metro Areas

Consumers keep borrowing, but delinquency rate data do not appear to signal a severe debt problem on the horizon. 19

NATIONAL OVERVIEW

Headwinds, Tailwinds and Whirlwinds: Forecasting the 2019 Economy

Conflicting data and the partial government shutdown made forecasting more challenging at the start of this year. 22

ECONOMY AT A GLANCE 23

ONLINE EXTRA

Why Are More Credit Unions Buying Community Banks?

Credit unions acquired seven banks in 2018, up from three in 2017. Time will tell whether such acquisitions grow.

Read more at www.stlouisfed.org/re.

The St. Louis Fed's Focus on Women in Economics

Economics is a male-dominated field. Women are underrepresented starting at the undergraduate level, and the gap widens carrying forward to advanced careers in economics.

For example, one study found that more than half of undergraduates who earned bachelor's degrees in any discipline from 2011-2015 were women, but less than one-third of those who majored in economics were women.¹ Another study found that women earned about 31 percent of doctorates in economics in 2014.² In contrast, women made up more than half of those earning a doctorate in other social sciences, STEM (science, technology, engineering and math) fields and the humanities and more than 40 percent of those earning a doctorate in business. Looking at academia, where the next generation of economists are trained and mentored, another report revealed that the share of full professors (a tenured position) who were women was 14 percent among departments with Ph.D. programs in economics and 24 percent among those without such programs in 2017.³

In an era when diversity has become fundamental to success, these statistics paint a rather dismal picture. Considering the economics profession's influence on public policy, attracting more diverse candidates is paramount. Yet, with the limited pipeline of diverse talent discussed above, creating real change means playing the long game.

Seeing an opportunity to contribute in this area, St. Louis Fed staff created a new initiative in 2018: the Women in Economics (WIE) symposium and podcast series.⁴ This initiative is designed to connect young women with accomplished women in the economics profession who share the story of their career journey, helping inspire women who wonder if economics is a profession they should (and actually could) pursue.

WIE Symposium

The first WIE symposium was held at the St. Louis Fed in February 2018. Attendees included more than 120 women studying economics at the undergraduate level, who came from 14 different states and 43 different colleges and universities. During the symposium, these undergraduates had the opportunity to hear from some of the top economists in the U.S. (who happen

to be female), to obtain career advice and to network with women who have diverse careers in the field of economics.

The feedback characterized the symposium as outstanding, and based on its success, a second WIE symposium was held this past February. We are working with colleagues across the Federal Reserve System to make the WIE symposium a national program.

WIE Podcasts

The WIE podcast series highlights the careers of women who are prominent economists in business, academia and the Federal Reserve System. The podcasts focus on their personal stories about what inspired them to study economics, the challenges they have faced throughout their careers, who their mentors have been and how they are mentoring others.

The podcast series kicked off with three speakers from the first WIE symposium: Mary Daly (now president of the San Francisco Fed), Claudia Sahm (section chief of consumer and community development research at the Federal Reserve's Board of Governors) and Ellen Zentner (managing director and chief U.S. economist at Morgan Stanley).

Since the initial launch, additional podcasts featuring women from a variety of economics professions have been released roughly once a month. As of March, the series also included podcasts with two more of my colleagues on the Federal Open Market Committee (Lael Brainard and Loretta Mester) as well as economists working at the St. Louis Fed (Paulina Restrepo-Echavarría), in academia (Fenaba Addo, Amanda Bayer, Lisa Cook, Susan Feigenbaum, Gail Heyne Hafer and Una Osili), at the Brookings Institution (Louise Sheiner) and in business (Diane Swonk and Kate Warne). We also have a podcast with David Wilcox (former director of the research and statistics division of the Board of Governors), who talked about his work related to this topic.

Importance of Diversity

The WIE symposium and podcasts support the St. Louis Fed's commitment to diversity and inclusion. We understand that organizations make better decisions when they have input from a diverse group



Women in Economics Symposium, 2019

of people. The same is true when it comes to monetary policy, for instance. Including diverse perspectives leads to better policy decisions, which ultimately leads to better macroeconomic outcomes. Having more women and underrepresented minorities in the field is necessary to ensure these diverse views are taken into account in business and policy decisions.

We have seen a groundswell of support—both throughout the Federal Reserve System and outside it—for continuing and even expanding our WIE effort. At the Bank, we recognize the potential impact that this initiative can have in promoting more diversity in economics. As a result, the WIE symposium and associated podcast series won the 2018 St. Louis Fed President's Award for Innovation. While more needs to be done to help raise awareness of these issues and to encourage more women to pursue a career in economics, the WIE effort makes great strides in these areas. RE

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

(This article was published online April 5.)

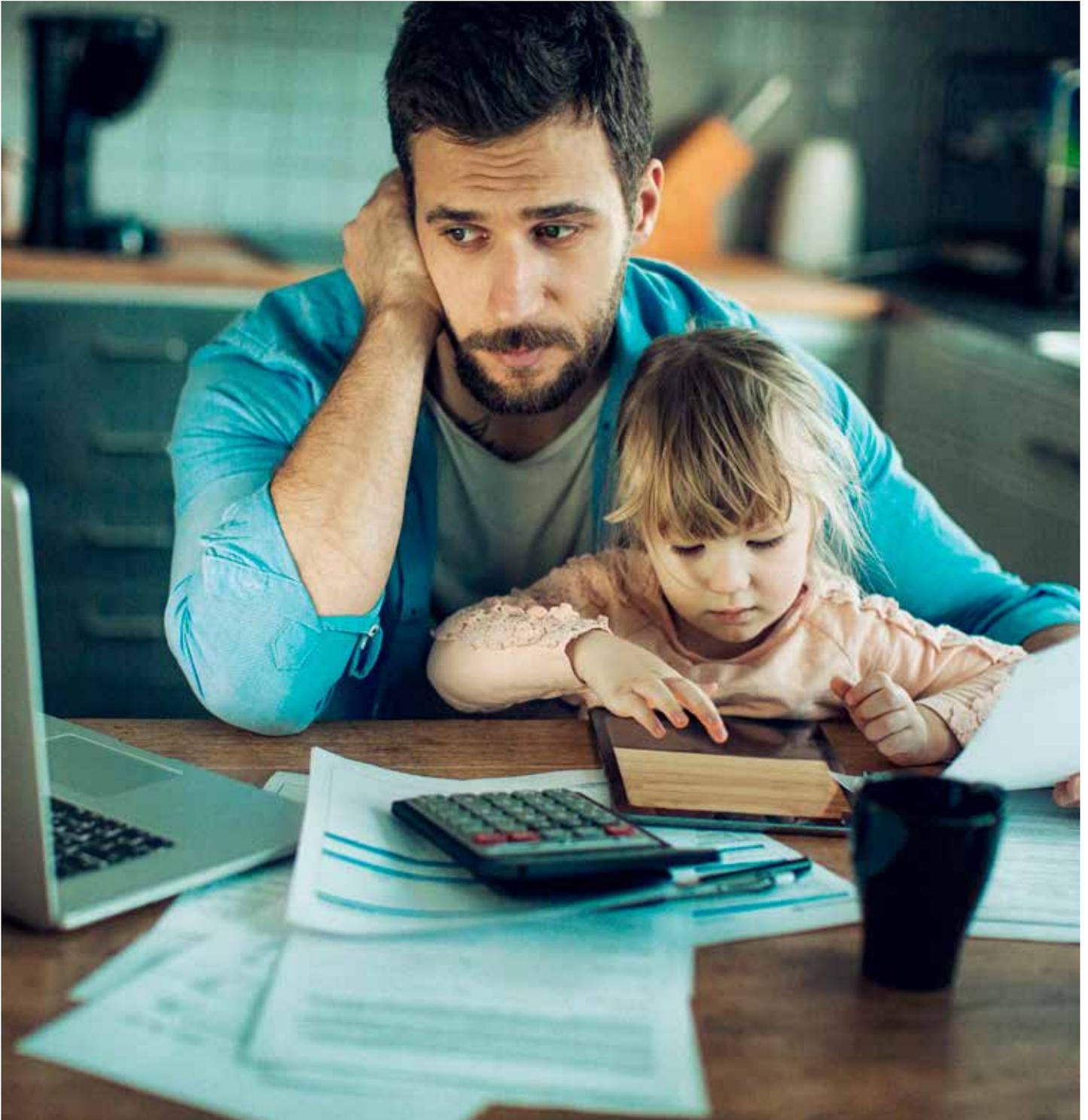
ENDNOTES

- ¹ The authors looked at four-year, not-for-profit colleges and universities in the U.S. See Bayer, Amanda; and Wilcox, David. "The Unequal Distribution of Economic Education: A Report on the Race, Ethnicity, and Gender of Economics Majors at US Colleges and Universities." Finance and Economics Discussion Series 2017-105, Board of Governors of the Federal Reserve System, October 2017.
- ² These numbers are based on data for U.S. citizens and permanent residents. See Bayer, Amanda; and Rouse, Cecilia Elena. "Diversity in the Economics Profession: A New Attack on an Old Problem." *Journal of Economic Perspectives*, Fall 2016, Vol. 30, No. 4, pp. 221-42.
- ³ See Lundberg, Shelly. Reports from the American Economic Association's Committee on the Status of Women in the Economics Profession, 2018 Issue 1.
- ⁴ Videos from the WIE symposia can be found at www.stlouisfed.org/education/women-in-economics. Podcasts can be found at www.stlouisfed.org/timely-topics/women-in-economics.

The Unequal Recovery:

Measuring Financial Distress by ZIP Code

By Ryan Mather and Juan M. Sánchez



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KEY TAKEAWAYS

- Aggregate changes in the balance sheets of U.S. households show improvements since 2010, but the recovery has not been the same for everyone.
- Analyzing changes in wealth, debt and financial distress by ZIP code offers a different perspective on household financial resilience.
- Neighboring ZIP codes, even within the same city, often experience divergent outcomes defying the national trend.
- Since 2015, housing wealth, debt and financial distress have been rising the fastest in the poorest ZIP codes, increasing their vulnerability to housing price downturns.

In its most recent Financial Stability Report, the Federal Reserve Board of Governors tempered a largely positive view of the U.S. financial system with several concerns about remaining vulnerabilities. Noticeably absent, however, were any major concerns over household balance sheets. The report held instead that “household borrowing has advanced more slowly than economic activity and is largely concentrated among low-credit-risk borrowers.”¹ What is more, this assessment came just after a historic announcement by the Federal Reserve in June 2018 that aggregate U.S. wealth had surpassed the \$100 trillion mark for the first time in history.²

This is important progress, especially because of the outsized role that deteriorating household balance sheets played in the Great Recession. Many narratives have been told for exactly why that recession was as bad as it was, but a common plot element is that declining house prices forced highly leveraged households

to reduce consumption drastically. For example, economists Atif Mian, Kamalesh Rao and Amir Sufi estimated that for every dollar of housing wealth lost, households’ consumption decreased by 5 to 7 cents.³ While that may not seem like much out of any given dollar, the effect quickly becomes massive when added up across all home value losses suffered by all households.

Furthermore, using county and ZIP code level data, Mian, Rao and Sufi show that this effect differs substantially across regions, and that the consumption patterns of poorer areas with high leverage tend to be significantly more sensitive to changes in wealth. In other words, it is not merely the aggregate changes in wealth that are significant determinants of consumption but also the way that those changes in wealth are distributed across households. A decline in house prices that occurs in a poorer area with high leverage is going to have a larger effect dollar for dollar than the same change made to a wealthy area with relatively low debt.

Our Data

Recent research by Fed economists Kartik Athreya, José Mustre-del-Río and Juan Sánchez suggests that for individual borrowers, financial distress is not a transitory phenomenon but rather a highly persistent one. To put it differently, while most people never have credit card payments over 120 days delinquent, they found that among those who at some point do, more than 30 percent spend at least a quarter of their time that way.⁴ In this article, we use a data set prepared for the follow-up paper, which is currently research in progress entitled “The Aggregate Implications of Household Financial Distress.”

The methodology—which is similar to that in Mian, Rao and Sufi—creates a data set of household balance sheets at

the ZIP code level and examines whether the change since the beginning of the economic recovery in 2010 has been as positive as it seems at the aggregate level. ZIP codes, being nothing more than a collection of individuals within certain geographical boundaries, are thus used to represent individuals with certain characteristics.

Four components of net wealth are considered: total debt, housing wealth, stocks and bonds. In constructing total debt, we distribute total household and nonprofit liabilities from the Federal Flow of Funds across ZIP codes to match the distribution in total debt found in the Federal Reserve Bank of New York/Equifax Consumer Credit Panel (CCP) data set. Housing wealth is measured simply as the median home price by ZIP code multiplied by the corresponding number of households.⁵ Finally, stocks and bonds are found similar to total debt, first by taking aggregate financial assets as recorded in the Flow of Funds, then distributing them across ZIP codes to match the distribution of earnings on interest in the IRS Statistics of Income (SOI) data sets.⁶

Next, in addition to these variables on net wealth by ZIP code, we compute a measure of households’ financial distress at the ZIP code level. Specifically, we track the percentage of people within a ZIP code that have reached at least 80 percent of their credit limit, that is, the maximum balance that they can hold on their bank-issued credit cards.

In total, the data that we will use for this article include yearly measures for some 38,977 distinct ZIP codes (there are about 42,000 in the U.S.). Of these, we have data from 36,944 in each of the three key years—2010, 2015 and 2018—on which this analysis will be focused. This will allow for a comparison of year-over-year changes in household balance sheets at the ZIP code level,

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



affording a much more disaggregated perspective than can be provided by national statistics.

The Distribution of Wealth Growth since 2010

In Table 1, the economic recovery since 2010 is divided into two periods based upon the monetary policy that presided over each. In the first, lasting until 2015, the Federal Reserve pushed interest rates near zero to stimulate the economy. Then, beginning in December 2015, the Federal Reserve has been lifting interest rates.

For each period, the table's bottom row displays the national average yearly growth rate for the corresponding category of wealth taken from the Federal Flow of Funds. Just above that is the corresponding weighted average from our sample, which is very close to the Flow of Funds rate in all cases. While both periods saw similarly robust growth in terms of net wealth (7.4 percent for 2010-2015 and 6.2 percent for 2015-2018), the composition of that growth is quite different. From 2010 to 2015,

financial wealth was the strongest component of growth (6.9 percent), and debt accumulation was very low (0.5 percent).

Beginning in 2015, however, U.S. housing wealth posted the largest gains (6.1 percent) and brought with it faster debt accumulation as well (2.7 percent). Should house prices drop again, households may find themselves more highly leveraged and vulnerable than they were at the beginning of 2015.

The rest of the table shows the dispersion of these growth rates across ZIP codes in our sample, ranked from lowest to highest in each category. Over the years 2010-2015, for example, ZIP codes at the 90th percentile in terms of debt accumulation saw their debt grow by 6.2 percent annually, well above the national average of 0.5 percent annually. The dispersion is even wider from 2015 to 2018.

Similarly, during the period 2010-2015, 10 percent of ZIP codes experienced declines in financial distress—the share of households that reached at least 80 percent of their credit limit—greater than 1.9 percentage points, while at the other extreme, 10 percent of ZIP codes

experienced increases in financial distress no less than 1.1 percentage points.

The differences are again more drastic for the period 2015-2018, with the best-performing 10 percent of ZIP codes reducing financial distress by over 1.8 percentage points each year and the worst-performing 10 percent of ZIP codes increasing in financial distress by no less than 2.7 percentage points each year.

A Geographic Perspective

Another way of seeing the diversity in households' financial stability is by plotting the data geographically. Figure 1 shows the average yearly change in financial distress between 2010 and 2015, and Figure 2 does the same for 2015 and 2018. In Figure 2, for example, if a ZIP code's shading is in the category of 1 to 2 percentage points, then the percentage of its population in financial distress increased by 3 to 6 percentage points from 2015 to 2018.

We also marked only changes that are statistically different than zero, which

Table 1

Variations in Balance Sheet Components and Financial Distress by ZIP Code

Average Year-over-Year Changes during Two Phases of the Economic Recovery

Percentiles of growth for each variable	Debt		Financial Wealth		Housing Wealth		Net Wealth		Financial Distress	
	2010-15	2015-18	2010-15	2015-18	2010-15	2015-18	2010-15	2015-18	2010-15	2015-18
1%	-16.1%	-17.8%	-14.3%	-12.2%	-5.9%	-0.8%	-8.8%	-10.1%	-3.4	-4.0
10%	-6.6%	-6.1%	1.4%	-1.1%	-0.7%	3.2%	2.0%	0.5%	-1.9	-1.8
25%	-3.2%	-1.9%	4.1%	3.3%	1.2%	5.0%	4.4%	4.3%	-1.2	-0.7
50%	0.1%	2.1%	6.5%	5.8%	3.6%	7.1%	6.9%	6.8%	-0.4	0.4
75%	3.3%	6.3%	8.9%	7.6%	6.3%	6.6%	9.6%	9.0%	0.4	1.6
90%	6.2%	10.7%	11.8%	9.8%	8.8%	11.9%	12.5%	11.3%	1.1	2.7
99%	13.1%	21.0%	19.6%	18.6%	13.7%	16.6%	19.2%	18.0%	2.7	5.2
Weighted Sample Mean	0.5%	2.7%	6.8%	5.4%	4.1%	7.4%	7.4%	6.5%	-0.4	0.5
Federal Flow of Funds	0.5%	2.7%	6.9%	5.8%	5.0%	6.1%	7.4%	6.2%	-	-

SOURCES: Federal Reserve Bank of New York/Equifax Consumer Credit Panel, IRS Statistics of Income, Zillow, Federal Flow of Funds, U.S. Census Bureau and authors' calculations.

NOTES: ZIP codes have been divided into percentiles for each variable and period separately; for example, a ZIP code in the bottom 10 percent of debt growth may not be in the bottom 10 percent of financial wealth growth, and a ZIP code in the top 10 percent of financial distress growth from 2010 to 2015 may not be in the top 10 percent of financial distress growth from 2015 to 2018. The financial distress columns show the annual percentage point change in the fraction of people in a ZIP code who have reached at least 80 percent of their total credit limit across all their bank-issued credit cards. From 2015 to 2018, for example, the number of people with financial distress in an average ZIP code was increasing at a rate equal to 0.5 percent of their population each year. The national change for household wealth was constructed from the Federal Flow of Funds' category of household and nonprofit real estate.

What Do ZIP Codes Tell Us about Financial Distress in the Economic Recovery?

Borrowers are defined as being in “financial distress” if they have used at least 80 percent of their credit limit across their bank-issued credit cards.

Figure 1

From 2010 to 2015, 65 percent of households lived in ZIP codes experiencing statistically significant declines in financial distress (blue shading). Only 14 percent lived in ZIP codes that saw significantly increasing financial distress (red shading).



Figure 2

From 2015 to 2018, only 20 percent of households lived in ZIP codes experiencing statistically significant declines in financial distress, while a full 58 percent lived in ZIP codes that saw significantly rising financial distress.



NOTES: Maps were constructed using the Federal Reserve Bank of New York/Equifax Consumer Credit Panel and authors’ calculations. Especially in rural areas, limited populations make it difficult to calculate robust estimates of financial distress. In order to correct for any sampling bias, then, we bootstrap samples to obtain a measure of the uncertainty (standard errors) in the percent of people in financial distress for each ZIP code, and present only significant changes compared with the estimated standard errors. In addition, to control for outliers and limit the range of the largest and smallest color brackets, in each figure we remove ZIP codes in the top and bottom half a percent of the distribution for annual financial distress changes.

Table 2

Variations in Balance Sheet Components and Financial Distress by Income

Average Year-over-Year Changes during Two Phases of the Economic Recovery

Quintiles	Adjusted Gross Income		Debt		Financial Wealth		Housing Wealth		Net Wealth		Financial Distress	
	2010-15	2015-18	2010-15	2015-18	2010-15	2015-18	2010-15	2015-18	2010-15	2015-18	2010-15	2015-18
First	\$32,000	\$35,000	0.1%	3.3%	3.0%	4.9%	2.5%	9.0%	4.1%	6.8%	-0.4	0.8
Second	\$42,000	\$47,000	-0.1%	3.1%	4.3%	4.7%	2.7%	8.7%	4.8%	6.4%	-0.4	0.8
Third	\$51,000	\$58,000	0.3%	2.9%	5.1%	5.0%	3.3%	8.4%	5.7%	6.7%	-0.3	0.5
Fourth	\$64,000	\$73,000	0.3%	3.0%	6.3%	5.2%	3.8%	8.0%	6.9%	6.5%	-0.4	0.5
Fifth	\$115,000	\$141,000	0.9%	2.5%	7.9%	4.4%	4.8%	6.7%	8.3%	5.3%	-0.4	0.1

SOURCES: Federal Reserve Bank of New York/Equifax Consumer Credit Panel, IRS Statistics of Income, Zillow, Federal Flow of Funds, U.S. Census Bureau and authors' calculations.

NOTES: Adjusted gross income is rounded to the nearest thousand. Financial distress shows the average annual percentage point change in the fraction of people in a ZIP code who have reached at least 80 percent of their credit limit.

is why much of each map shows “no change,” especially in large rural areas with small populations.

The national trend is immediately apparent in both maps: While financial distress along our measure improved across most of the country from 2010 to 2015, it deteriorated with similar yearly magnitude from 2015 to 2018.

At the same time, it is equally apparent that this national trend masks a large amount of variation within states and even within counties. To give some perspective on these numbers, the national weighted average of borrowers reaching at least 80 percent of their credit limit in our sample was 16.5 percent, 14.7 percent and 16.1 percent in the years 2010, 2015 and 2018, respectively. Those ZIP codes in the deepest shade of red, then, were deteriorating each year by around an eighth or more of the national average. Compare that to the darkest shade of blue, which marks ZIP codes that were improving each year by around an eighth or more of the national average.

That so many areas show these two extremes directly adjacent to one another points to how conditions of financial distress can diverge rapidly across neighborhoods. This effect is particularly pronounced in major population centers where ZIP codes parcel out smaller areas of land, such that they are impossible to distinguish in the national graphs of Figures 1 and 2.

Consider, for example, Hennepin County in Minnesota and, within that, the city of Eden Prairie, which is composed of three mutually adjacent ZIP codes: 55344 to the east, 55346 to the west, and 55347 to the south. The eastern ZIP code experienced almost no change in net wealth from 2010 until 2015 but a slight increase in financial distress, while the western and southern ZIP codes experienced sizable increases in net wealth and slight decreases in financial distress over the same period.

After these changes, in 2015, the share of residents in all three ZIP codes that had used at least 80 percent of their credit limit was nearly identical: about 10.6 percent. During the period from 2015 until 2018, however, the eastern and southern ZIP codes each experienced increases in financial distress of about 6 percentage points, putting them near the national mean of 16.1 percent in 2018. By contrast, financial distress in the western ZIP code remained nearly unchanged over the same time period.

Clearly, the recovery experiences of these three ZIP codes were very different, even though all of them are in the same city; they share the same community center, send their children to the same public high school, and have but one McDonald's restaurant.

The Unequal U.S. Economic Recovery

From 2015 to 2018, households in the poorest ZIP codes had the biggest rises in housing wealth, debt and financial distress. This raises questions about the resiliency of poorer ZIP codes in the event of a housing downturn.



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	DEBT	HOUSING WEALTH	FINANCIAL DISTRESS
Poorest 20 percent of ZIP codes (Average Income: \$35,000)	+3.3%	+9.0%	+0.8 ppt
Richest 20 percent of ZIP codes (Average Income: \$141,000)	+2.5%	+6.7%	+0.1 ppt

Average Year-over-Year Change from 2015-2018

Financial Distress is defined as the share of people in a ZIP code who have reached at least 80% of their credit limit

SOURCES: Federal Reserve Bank of New York/Equifax Consumer Credit Panel, IRS Statistics of Income, Zillow, Federal Flow of Funds, U.S. Census Bureau and authors' calculations.

NOTES: PPT, percentage point. Income is based on average adjusted gross income.

What This Distribution Suggests about Aggregate Financial Stability

Given that there has been a wide dispersion in measures of wealth growth across ZIP codes since 2010, it seems fair to reconsider what the current distribution of households' financial conditions means for financial stability. If it is the case that growth has been concentrated in the hands of wealthy ZIP codes with low leverage, then the poor and high-leverage ZIP codes that are more affected by wealth shocks may still be vulnerable. What's more, trends in less affluent groups are masked in nationally aggregated statistics by groups with more wealth.

Imagine an economy with two people, one of whom has \$1 of wealth and the other \$99. Imagine further that the poorer individual's wealth drops to

nothing the next year, while the other's remains unchanged. A nationally aggregated statistic will observe \$100 of wealth in the first period and \$99 in the next, which represents a 1 percent decrease in net wealth. The poorer individual, however, experienced a life-changing 100 percent decrease. Given how the top 1 percent in our country has around 40 percent of all wealth, this contrived example is not entirely unlike the real world. Life-changing shocks to net wealth at the lowest percentiles may be entirely invisible under near trivial changes at the highest percentiles.

Table 2 divides the ZIP codes into five groups—quintiles—in order of increasing average gross income per household and then reports average year-over-year changes like those of Table 1 for each

group. From 2010 to 2015, for example, the poorest group of ZIP codes made an average of \$32,000 in gross income per household and had an average year-over-year growth rate in net wealth equal to 4.1 percent.

Strikingly, since 2015, housing wealth, debt and financial distress have all been rising fastest in the poorest ZIP codes by average gross income. It was mentioned earlier that at the national level, the rapid accumulation of housing wealth and debt in this period increased the economy's vulnerability to a housing price shock like the one that predated the Great Recession. Now it is seen that this change in vulnerability was concentrated among poorer households, which makes intuitive sense given that they tend to have a higher percentage of their wealth in their homes and less in financial markets than do wealthier households.

By contrast, housing wealth, debt and financial distress all rose the slowest since 2015 for the wealthiest of households, signaling that the aggregate growth in stability since 2015 against this type of housing shock may have been concentrated in the hands of those who need it the least.

For the moment, though, the strong increases in housing wealth for the lower-income ZIP codes after 2015 have produced some of the largest gains in net wealth for that period, which is a very positive thing if house prices remain high. This comes as a strong reversal of the trend in the previous period: After the end of the recession in 2009, the wealthier households in terms of gross income began to recover faster in terms of net wealth, with the highest-income group experiencing an average annual growth rate in excess of 8 percent until 2015.

For all income groups, our measurement of financial distress decreased on average each year from 2010 to 2015, and then increased on average in the years from 2015 to 2018. Given that the period from 2015 to 2018 was also marked by Federal Reserve decisions to raise interest rates, this was a relatively expensive time to accumulate debt and therefore an unfortunate period to show this trend in financial distress.

Again, the dynamics of financial distress across income groups are interesting. While all groups saw distress decrease at approximately the same rate from 2010 to 2015, the increase in financial distress for the period that followed was concentrated in the poorest areas.

Conclusion

On almost every aggregate measure, the national recovery in household balance sheets since 2010 has been positive. Even our measure of financial distress, which increased nationally from 2015 until 2018, shows a net national decrease when compared against 2010. Underneath that rosy narrative of recovery, however, lies substantial heterogeneity at the level of ZIP codes, and mixed messages on the resiliency of many households to face another recession. **RE**

(This article was published online April 18.)

ENDNOTES

- 1 See Board of Governors of the Federal Reserve System, p. 17.
- 2 See Torry.
- 3 See Mian, Rao and Sufi.
- 4 See Athreya, Mustre-del-Río and Sánchez.
- 5 For this measure, we use Zillow data to find the median home price and census data to find the number of households in a ZIP code. Census data are not available over all years, so we interpolated missing data linearly.
- 6 Unfortunately, the most recent year for which IRS SOI data are available is 2016. In 2017 and 2018, then, we are forced to assume that the distribution of interest earnings has not changed since 2016 and that only the aggregate totals have changed. This does limit the accuracy of our estimates of financial wealth, but calculations based upon the years for which we do have full information would suggest that our data are sufficient to account for about 40 percent of the variation in the change in financial wealth at the ZIP code level from 2015 to 2018.

REFERENCES

- Athreya, Kartik; Mustre-del-Río, José; and Sánchez, Juan M. "The Persistence of Financial Distress." *The Review of Financial Studies*; Feb. 1, 2019. See <https://academic.oup.com/rfs/advance-article/doi/10.1093/rfs/hhz009/5305595>.
- Board of Governors of the Federal Reserve System. "Financial Stability Report." November 2018. See www.federalreserve.gov/publications/files/financial-stability-report-201811.pdf.
- Mian, Atif; Rao, Kamallesh; and Sufi, Amir. "Household Balance Sheets, Consumption, and the Economic Slump." *The Quarterly Journal of Economics*, November 2013, Vol. 128, No. 4, pp. 1687-1726.
- Torry, Harriet. "Americans' Wealth Surpasses \$100 Trillion." *The Wall Street Journal*, June 7, 2018. See www.wsj.com/articles/u-s-net-worth-surpasses-100-trillion-1528387386.

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What Real Interest Rates Tell about the Recession to Follow

A negative correlation between real interest rates before a recession and the severity of the recession seems to exist.

“These empirical results are provocative and suggest there may be a causal relationship between levels of real interest rates and economic output. Our preferred view is that low levels of real interest rates capture early warnings of future slowdown in economic growth. Furthermore, this view suggests that the lower the level of the real rate, the higher the likelihood that the economy will enter a recession. According to this view, future slow growth causes a decline in long-term real interest rates, and not the other way around.”

www.stlouisfed.org/on-the-economy/2019/april/real-interest-rates-tell-recession-follow

“Debtless” Housing Boom Leads Household Wealth Recovery

Did surging house prices fuel rising mortgages, or vice versa? Recent data don't support either.

“A commonly held view of the housing bubble is that excessive mortgage growth fueled the price surge. However, other economists believe the opposite: The bubble sentiment created the rising home values (used as collateral) necessary to support rapidly rising mortgage borrowing.

“Annual data from the recession (and aftermath) period 2006-18 support neither view. In fact, since 2006, there has been essentially no relationship between the growth rate of mortgage borrowing and the change in value of the housing stock. This period, together with the unresolved nature of the earlier dispute, suggests we still do not have a clear understanding of the relationship between mortgage borrowing and housing values.”

www.stlouisfed.org/on-the-economy/2019/february/debtless-housing-boom-leads-household-wealth-recovery



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Open Vault blog (www.stlouisfed.org/open-vault)



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Education and Wealth's Catch-22

Research shows that education and wealth each predict the other. Compared to a similar family without a college degree, the income of the average family with a four-year college degree was 69% higher; wealth was a staggering 201% higher.

“The rising cost of college and the high prices of assets (such as a home) are likely dampening those returns, especially for younger generations, but college remains worth the investment on average.”

www.stlouisfed.org/open-vault/2019/february/education-wealth-catch-22



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The Fed's Inflation Target: Why 2 Percent?

The FOMC targets a 2 percent inflation rate. Here are three arguments economists make for having a positive inflation target and why it's important.

“Why do inflation expectations matter? They are important for actual inflation, as Bullard explained in a 2016 *Regional Economist* article. ‘Modern economic theory says that inflation expectations are an important determinant of actual inflation,’ he wrote.”

www.stlouisfed.org/open-vault/2019/january/fed-inflation-target-2-percent

Female-Led Firms: Trends and Differences Relative to Male-Led Firms

By Matthew Famiglietti and Fernando Leibovici



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KEY TAKEAWAYS

- Despite women's growing role in the workforce, the share of firms led by women CEOs was only 18.8 percent in 2014, relatively stable from 17.6 percent in 2000.
- Regarding new firms, the share of firms with female CEOs was 24.1 percent in 2014, up from 19.7 percent in 2000.
- Female CEOs lead smaller and younger firms, with similar credit ratings as their male-led counterparts. Women are also more likely to lead nonprofits and proprietorships.

While much work has been done to improve our understanding of women in the workforce, much less is known about their roles as entrepreneurs and executives in the private sector. The goal of this article is to investigate the role played by women in leading firms in the U.S.

To do so, we used the National Establishment Time-Series (NETS) database collected by Dun & Bradstreet, which contains detailed information on the universe of firms in the U.S. over recent decades. Among many other variables that are available, the data set allows us to identify whether the firm's CEO is a woman; we identify these firms as *women-led firms*.

The figure and table in this article were computed based on a 5 percent random sample of firms from the NETS database for the period 2000-2014; 2014 is the last year with available data. Given the database is at the establishment level, we analyzed firms by aggregating the database at the headquarters level.

We abstracted very small firms from our analysis by restricting attention to firms with at least five employees on

average over the sample period. Additionally, we considered only firms for which the gender of the CEO is not missing.

Has the Share of Women-Led Firms Increased?

We began by investigating the extent to which the prevalence of women-led firms has increased over time. Figure 1 reports the share of firms led by women over time across all firms as well as across new firms.

The figure shows that the share of all firms with a female CEO was very stable over this period: The percentage of women-led firms rose gradually from 17.6 percent in 2000 to 18.8 percent in 2014. In contrast, the share of women-led firms across new firms increased at a faster rate: It rose from 19.7 percent to 24.1 percent over the same period. Despite the significant change in the share of new firms led by women, the small portion of new firms across all firms implies that the share of women-led firms among existing firms had increased very slowly over this time period.

These findings contrast markedly with the increased female labor force participation in the postwar era. While women are becoming increasingly integrated into the labor market, it seems that much progress remains to be done to increase female participation as business leaders and top executives.

Are Women-Led Firms Different?

We then investigated the extent to which women-led firms differ from their male-led counterparts. To do so, we used the data described above to summarize key characteristics of the firms.

The results are presented in the

accompanying table, where we contrast salient features of the firms—including size, credit rating and the form of organization—between those with female CEOs and their counterparts with male CEOs.

Size. The data set provides two key variables to examine the relationship between the gender of the CEO and firm size: the number of employees and the firm's annual sales. We found that the size difference between the two types of firms is striking: Compared with firms led by male CEOs, women-led firms have, on average, less than half the sales and about two-thirds of the number of workers. Note that firms led by male CEOs are also older than those with female CEOs, which may account for part of the size difference.

Credit ratings. One of the unique features of the NETS database is that it provides detailed information on firms' credit scores: the Paydex credit score and a credit appraisal rating. The Paydex credit score is a rating from zero to 100 that rates the timeliness of payments across establishments, with 100 being the highest credit score; it is similar to the FICO credit score for individuals. The credit appraisal rating is available for firms with enough information on various statistics, such as revenue and net worth; the rating ranges from 1 to 4, with 4 being the highest credit appraisal score.

We found that the average credit measures across the two groups of firms are nearly identical. On average, we found that women-led firms have a slightly higher Paydex and a slightly lower credit appraisal than male-led firms; however, the differences are minor. Thus, we conclude that firm creditworthiness does not differ materially between the two groups.

ABOUT THE AUTHORS

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



Figure 1

Share of U.S. Firms Led by Women



SOURCES: Dun & Bradstreet's National Establishment Time-Series (NETS) database, and authors' calculations.

NOTE: Data were derived from a 5 percent random sample of firms that identify the gender of the chief executive and have at least five employees on average during the sample period.

CEOs: Their Gender and Where They Work

	Female CEO	Male CEO
FIRM SIZE		
Average Sales (Millions of Dollars)	2.07	5.19
Average Number of Employees	23.40	35.30
Average Firm Age	26.31	31.18
CREDIT RATING		
Average Paydex Credit Score	71.61	71.60
Average Credit Appraisal	2.48	2.50
PUBLIC VERSUS PRIVATE		
Public Firms	0.05%	0.25%
Private Firms	99.95%	99.75%
TYPE OF ORGANIZATION		
Nonprofit	9.26%	4.45%
Proprietorship	18.36%	13.73%
Partnership	10.73%	13.09%
Corporation	61.66%	68.77%
TYPE OF VENDOR		
Government Contractor	2.75%	3.86%

SOURCES: Dun & Bradstreet's National Establishment Time-Series (NETS) database, and authors' calculations.

NOTES: Values for firm size and credit rating are average values in 2014; values for other characteristics are average values from the period 2012-2014. For the distribution of firm organization, the data were adjusted to add up to 100 percent by removing firms that did not report an organization type.

Firm type. The data set also contains information that allows us to examine the relationship between gender and the composition of firms across (1) public versus private, (2) types of organization (i.e., nonprofits, proprietorships, partnerships

and corporations), and (3) type of vendor (i.e., government contractor). First, we found that 0.05 percent of firms with female CEOs were public firms, compared with 0.25 percent of firms with male CEOs. Second, we found that female CEOs are

more likely to work for nonprofits and proprietorships than their male counterparts, while the latter are more likely to work for partnerships and corporations. Finally, we found that male CEOs are more likely to work for firms that are government contractors.

Conclusion

Our findings show that women are significantly less likely to lead U.S. businesses than men and that this share has remained surprisingly unchanged over the period 2000-2014. Moreover, conditional on leading a business, women are likely to be CEOs of smaller and younger firms. Yet, the creditworthiness of female-led firms is on par with that of their male-led counterparts. Finally, we found that women are more likely to lead nonprofits and proprietorships than men, while men-led firms are more likely to be partnerships, corporations and government contractors.

These findings suggest that more work needs to be done to integrate women into the labor force. In particular, the findings suggest that despite the significant increase in female labor force participation in the postwar era, this does not appear to have led to greater participation of women in the highest executive position at the organizations where they work.

While these findings describe salient differences between firms led by male and female CEOs, they do not explain the causes behind these features. Further research needs to be conducted to identify the forces underlying the observed differences between firms led by male and female CEOs, and potential policies that might help to address these disparities.¹ **RE**

(This article was published online Feb. 13.)

ENDNOTE

¹ A recent study that addresses some of these questions is Gayle et al.; see references therein for other related studies.

REFERENCE

Gayle, George-Levi; Golan, Limor; and Miller, Robert A. "Gender Differences in Executive Compensation and Job Mobility." *Journal of Labor Economics*, Vol. 30, No. 4, October 2012, pp. 829-71.

Changing Trade Relations May Affect U.S. Auto Exports in Long Run

By Brian Reinbold and Yi Wen



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KEY TAKEAWAYS

- Concerns about the U.S. auto industry have helped spur the U.S. to revamp its trade relations.
- Yet continued U.S.-China trade disputes could leave U.S. automakers without access to the world's biggest auto market in terms of sales volume.
- USMCA, the proposed trade deal that replaces NAFTA, may also make U.S. vehicles less competitive in the global market.

The U.S. has one of the world's largest auto markets, yet some are worried that free trade has disadvantaged the country's competitiveness in automotive production. The recent renegotiation of the North American Free Trade Agreement (NAFTA) exemplifies this concern, because trade rules for the auto sector received an overhaul.

However, focusing solely on auto trade between the U.S., Canada and Mexico ignores the elephant in the room—China, home to the world's largest auto market in terms of units sold. (See Figure 1.) U.S. automakers may miss a huge opportunity in this rapidly growing market if U.S.-China trade disputes linger and if new North American trade rules make U.S. auto exports more expensive.

In this article, we will evaluate the effects of the North American trading bloc on the U.S. auto trade, look at the current landscape of the global auto market and explore the repercussions of further disruptions to trade.

NAFTA's Impact on Auto Trade

NAFTA was implemented on Jan. 1, 1994, with the goal of reducing barriers to trade between the U.S., Canada and Mexico. Numerous tariffs were eliminated,

and intellectual property rights on traded products were protected.

NAFTA was a huge victory for free trade at the time, but America's past commitment to free trade is now being questioned. There is concern that the persistent U.S. trade deficit led to a loss of manufacturing jobs and that the terms of NAFTA disadvantaged U.S. factory workers. As a result, NAFTA was renegotiated, and a new deal called the United States-Mexico-Canada Agreement (USMCA) was formally signed at the G-20 meeting in Argentina on Nov. 30, 2018; the U.S. Congress still has to ratify the new agreement. Although many provisions in NAFTA will be unchanged, the auto trade rules will be significantly revised.

In 1994, the U.S. ran a real trade deficit of \$63 billion (in 2012 dollars) in motor vehicles, and this deficit had nearly doubled by 2017. We also see that the U.S. trade deficit in vehicles has widened with major car manufacturing nations. This is not to attribute the rising trade deficit in vehicles solely to NAFTA as the overall U.S. trade deficit has increased nearly six-fold since 1994. But looking solely at the trade deficit tells only part of the story.

From 1994 to 2017, both U.S. exports and imports in autos doubled in terms of value, i.e., exports and imports increased in the same proportion. This suggests that the increase in auto imports has not crowded out auto exports. Although imports and exports in vehicles increased in the same proportion, the auto trade deficit still doubled because the U.S. was already running a trade deficit in vehicles in 1994. This rising auto trade deficit doesn't necessarily imply that the

competitiveness of the U.S. auto sector has been affected.

Also, the size of the U.S. economy as measured by gross domestic product (GDP) has almost doubled since 1994—a similar increase to what the U.S. auto trade deficit has undergone. Although the overall auto trade deficit as a percentage of GDP increased until 2000, it has since declined and is now near its 1994 level. Therefore, the auto trade deficit relative to the size of the economy remains unchanged since the signing of NAFTA.

Concluding that NAFTA has hurt U.S. auto manufacturing by looking solely at the increasing deficit in vehicles is very misleading. The proportion of imports to exports and the size of the deficit relative to GDP have been fairly constant since the commencement of NAFTA. The U.S. was already running a trade deficit in vehicles in 1994, so as the U.S. economy grew, this deficit widened despite the fact that the ratio of imports to exports was unchanged since the signing of NAFTA.

USMCA and Autos

The proposed trade agreement USMCA will not drastically change much of NAFTA, but auto trade rules will be significantly changed. For example, 75 percent of auto parts must be manufactured in North America to qualify for zero tariffs starting in 2020, up from the present level of 62.5 percent. This large increase will lead to major shifts in supply chains in a short period of time to avoid tariffs.

Also, at least 30 percent of the work on vehicles must be done by workers earning at least \$16 per hour. This share of work

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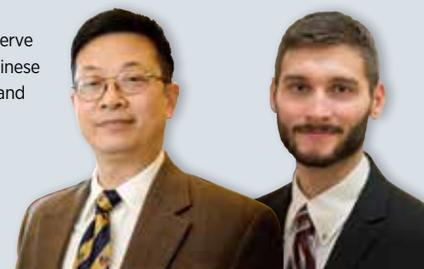
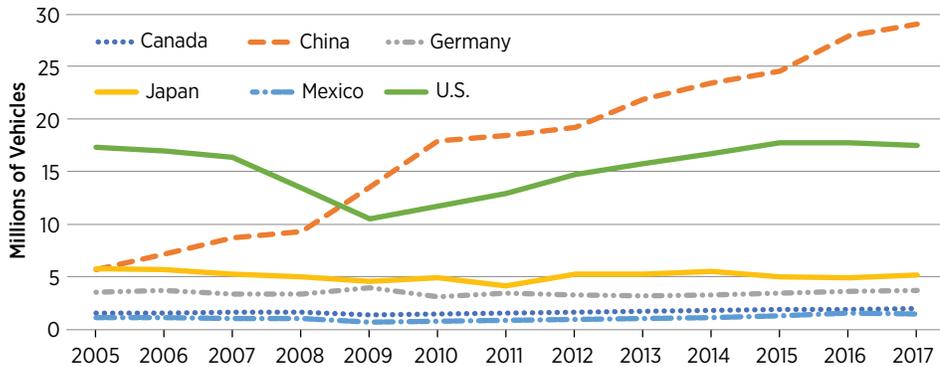


Figure 1

New-Vehicle Sales or Registrations



SOURCE: International Organization of Motor Vehicle Manufacturers.

produce cars in the U.S. and ship them to China, they would not be competitive with other foreign automakers operating in China because of high production and shipping costs. If the U.S. manufacturers cannot compete in this market, then their growth will be hampered, which could ultimately hurt autoworkers and possibly offset any benefits that these workers could gain under USMCA. Hence, trying to incentivize U.S. manufacturers to move production back to the U.S. and then export to countries like China is not economically feasible. ^{RE}

(This article was published online March 7.)

will then increase to 40 percent by 2023. This could benefit U.S. workers since they earn higher wages than workers in Mexico, but it would also increase the cost of cars made in North America. In the long run, this could lead to decreased global demand for cars manufactured in North America as they become less competitive in a global market, which could ultimately hurt U.S. autoworkers. Based on our previous analysis, USMCA is a solution searching for a problem in regard to auto trade. It also could make North American automakers less competitive in a global marketplace.

The Current U.S. Auto Market

U.S. auto sales totaled about 17 million units in 2017. The U.S. is also one of the world's largest auto importers: About 8 million vehicles were imported in 2017. Thanks to NAFTA, Mexico and Canada are the largest U.S. trading partners in vehicles. In 2017, the U.S. exported about 1 million vehicles, in total, to Canada and Mexico and imported about 4 million vehicles from Canada and Mexico.

Figure 1 shows that vehicle sales have been fairly constant since 2005 for Canada, Germany, Japan, Mexico and the U.S. (except for a dip during the Great Recession), suggesting that these countries' auto markets are saturated. A saturated market suggests that auto manufacturers will have to look for other markets to find growth opportunities.

U.S. vehicle sales also hit a record high in 2016, then dipped in 2017. If American auto manufacturers anticipate this trend to continue, then they may also look to

shift production abroad to better match global demand.

Although auto markets in these developed nations are saturated, China's auto market has increased fivefold since 2005, reaching nearly 30 million in 2017. This is about as large as the combined markets of Canada, Germany, Japan, Mexico and the U.S.

China provides a great opportunity for growth for U.S. auto producers; however, if USMCA makes North American auto manufacturers less competitive, they could miss out on a huge growth opportunity. Yet, USMCA may be an insignificant problem for U.S. automakers if a full-out trade war between China and the U.S. breaks out. If U.S. auto manufacturers are completely excluded from competing in China—the largest auto market in the world—then their potential growth could be seriously hindered.

Conclusion

Although the U.S. trade deficit in vehicles has increased since 1994, NAFTA does not seem to have impacted U.S. auto trade negatively. But USMCA could potentially hurt North American automakers' competitiveness in a global environment.

Furthermore, the Chinese auto market is huge relative to the North American market, but China is essentially self-sufficient and satisfies its auto demand through domestic production. Most automobiles sold in China are foreign brands, with U.S. car brands accounting for about 11 percent of the Chinese market.

If American auto manufacturers

Slowing U.S. Housing Sector Still Shaped by Great Recession

By Asha Bharadwaj and Charles S. Gascon

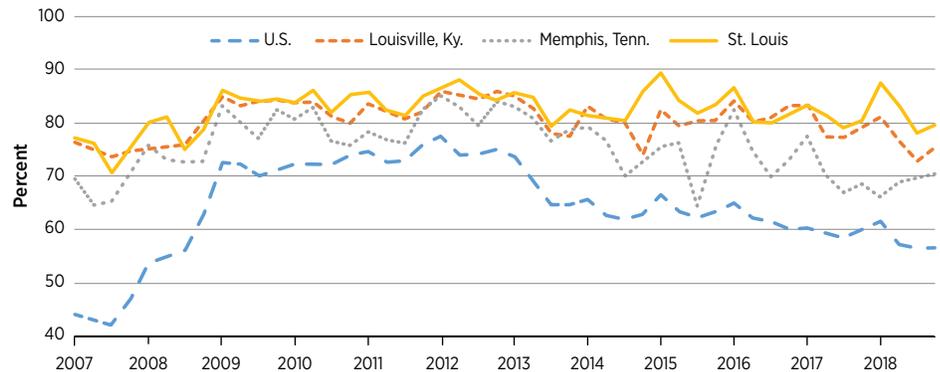


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KEY TAKEAWAYS

- The U.S. housing market has rebounded from the Great Recession, though the lingering effects of the downturn can still be seen.
- At the end of 2005, residential investment represented about 6.7 percent of U.S. GDP. At the end of 2018, this figure was only 3.8 percent of GDP.
- Declining affordability, higher mortgage rates, higher construction costs and declines in equity prices slowed the U.S. and District housing markets in 2018.

Housing Opportunity Index: U.S. and Key Eighth District MSAs



SOURCE: Haver Analytics.

NOTES: The HOI represents the share of homes sold in the area that could be affordable to a household earning the area's median income. Data for the Little Rock, Ark., metropolitan statistical area (MSA) were unavailable.

As the U.S. closes in on the 10th year of this economic expansion, unemployment is at its lowest rate since 1969, and in many ways, the Great Recession is now history. However, the U.S. housing market tells a different story, and the lingering effects of the Great Recession are still shaping this sector of the economy.

In this article, we will describe the trends in the housing market at the national level, and how these trends are different from the ones observed across the Eighth Federal Reserve District.¹

U.S. gross domestic product (GDP) has been steadily increasing since the end of the Great Recession, and real GDP grew by about 3.0 percent in 2018. The U.S. housing market is reflective of this growth and, in several ways, seems to have rebounded from the Great Recession.

The U.S. median house price in 2018 was about \$262,000; in real terms, this was about 43 percent higher than the bottom in 2011 but still 9 percent lower than the pre-recession peak. While a shortage of workers and building lots has hampered residential construction activity, residential building permits have grown 9.3 percent per year, and residential investment

has averaged 3.2 percent growth per year in the recovery period from 2010 to 2018. Home sales, while still below the pre-recession peak, have rebounded with a strong overall growth of 51.2 percent.

However, despite these positive effects of the recovery process, some subsectors of the housing market seem to be lagging. According to the National Association of Home Builders (NAHB), the housing contribution to GDP generally averages 15 to 18 percent, and it occurs through two channels: residential investment (such as construction of new homes and residential remodeling) and consumption spending on housing services (such as gross rents and utilities paid by renters, and owners' imputed rents and utility payments).²

While consumption spending on housing services has remained relatively constant (averaging 12.4 percent of GDP between 2011 and 2018), residential investment tells a different story. At the peak of the housing

bubble, toward the end of 2005, residential investment made up 6.7 percent of U.S. GDP; about a year after the recession ended, residential investment bottomed out at 2.4 percent of GDP. At the end of 2018, this share stood at only 3.8 percent of U.S. GDP, just slightly higher than its low point at the depths of the 1990 recession (3.4 percent).

It is also interesting to note that despite the rebound in home prices, households have not reverted to taking on more housing as assets in their portfolios. Residential real estate now accounts for up to 20 percent of household balance sheets, down from almost 30 percent before the Great Recession. Industry contacts point to factors such as higher student debt balances, tighter lending standards, lack of inventory of homes and slow wage growth as keeping potential buyers from the market.³ Consequently, single-family homes are less affordable than they were in the mid-1990s and early 2000s.⁴

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



Table 1

Housing Price and Affordability

	Nominal Median House Price (MHP)	Change in Real MHP since 2005:Q4 Peak	Average Nominal MHP Growth since 2011:Q4	Housing Opportunity Index (HOI) (In Percent)	Percentage Point Change in HOI
				2018:Q4	2011:Q4-2018:Q4
U.S.	\$262,279	-9.40%	6.30%	56.6	-19.3
Little Rock, Ark., MSA	\$146,955	-10.20%	1.60%	-	-
Louisville, Ky., MSA	\$182,412	3.80%	4.50%	75.4	-6.6
Memphis, Tenn., MSA	\$177,763	-6.30%	6.60%	70.4	-12.2
St. Louis MSA	\$179,103	-8.20%	4.60%	79.7	-5.3

SOURCES: National Association of Realtors, Haver Analytics and authors' calculations.

NOTE: MHP values are from 2018:Q4.

Table 2

Home Sales and Building Activity

	Home Sales Growth	Homeownership Rate	Single-Family Building Permit Growth	Population Growth	Housing Supply Elasticities
	2011-2018	2017	2011-2018	2011-2017	
U.S.	51.2%	63.9%	110.1%	4.3%	1.75
Little Rock, Ark., MSA	61.8%	61.0%	9.1%	4.0%	2.34
Louisville, Ky., MSA	-	71.7%	80.2%	4.0%	2.79
Memphis, Tenn., MSA	65.2%	62.4%	62.0%	1.2%	1.76
St. Louis MSA	65.2%	65.6%	62.5%	0.5%	2.36

SOURCES: Zillow, Saiz (2010), Haver Analytics and authors' calculations.

NOTES: Home sales data are from Zillow and are from January 2011 to November 2018. Due to data limitations, we do not have sales data for Louisville. U.S. value for the housing supply elasticities is a weighted average of all metropolitan statistical areas.

Recent Trends in the Housing Market

There are signs that 2018 may have marked the end of the strong run for the U.S. housing market during this recovery. Single-family home sales at the end of December 2018 were about 13 percent lower relative to the same period in 2017. House price growth has steadily decelerated since 2013, with the median sale price up by only about 1.5 percent in December 2018 relative to a year ago, as compared with 7.3 percent in the same period in 2017.

For the first time in this recovery period, housing prices increased at a slower rate than median family incomes in 2018. While incomes growing faster than prices may positively affect the market, housing continued to become

less affordable, as higher mortgage rates increased monthly payments, and declines in equity prices reduced other household assets that could be used for a down payment.

Construction activity remained positive in 2018 but faces headwinds to further growth, most notably a shortage of workers. Higher labor costs combined with higher material costs have put the cost of building a new home above the selling price in some markets. A reflection of these headwinds can be seen in the NAHB's Housing Market Index, which measures homebuilders' optimism: The index declined steadily during 2018, although it remained elevated by historical averages as of January 2019.

Higher labor costs combined with higher material costs have put the cost of building a new home above the selling price in some markets.

Housing Markets in the Eighth District

While there are some structural issues that make the Eighth District housing market different from the national market, regional trends have generally been consistent with national trends. Structural differences that play an important role in determining housing prices include housing affordability, population growth and the elasticity of the supply of housing.

Several factors determine housing demand, such as mortgage rates, housing affordability and population growth. Mortgage debt growth follows similar trends to those of the nation,⁵ indicating that other demand factors have a greater role in determining housing demand in the Eighth District.

The NAHB's Housing Opportunity Index shows that housing tends to be much more affordable in St. Louis, the District's largest metropolitan statistical area (MSA). Nationally, the median household could afford 56.4 percent of homes sold in the third quarter of 2018.⁶ For the median household in the St. Louis MSA, the number rises to 77.8 percent of homes sold. While greater affordability is indicative of higher demand, housing demand growth has steadily slowed over the past few years in the District, which is consistent with national trends (albeit at a slower rate).

In addition to housing affordability, the demand for housing can also be captured in population growth, which has increased more slowly in the District than in the nation. With fewer additional residents, fewer new homes or apartments are needed. However, we see that the effect of slower population growth is somewhat offset by other demand factors—such as lifestyle, location, affordability and relative rents—and this is reflected in higher homeownership rates in the District, relative to the nation.

Yet, economic research has typically found that supply-side factors are most important in explaining regional differences in housing prices. When demand increases and prices rise, homebuilders have an incentive to build more homes. Homebuilders' actual ability to respond to these higher prices is called the elasticity of housing supply.

Economist Albert Saiz points out that these elasticities vary greatly across cities, as building requires new land, permits, materials and labor. Saiz estimates a housing supply elasticity of 1.75 across all MSAs, which implies that an increase in house prices by 1 percent results in an increase in the supply of homes of 1.75 percent. In the extreme case of Miami, this elasticity falls to 0.60 percent, and on the other end is Wichita, Kan., at 5.45 percent. St. Louis has a supply elasticity of 2.36 percent.

Thus, it is clear that even though St. Louis has a relatively high elasticity of housing supply, it is experiencing a slower growth in home prices because demand factors, such as limited population growth and a declining homeownership rate, are exerting a downward pressure on prices.

Conclusion

Despite significant headwinds from changing household preferences, increasing student debt, tighter lending standards, and shortages of labor and lots, the U.S. and District housing markets have experienced stable growth since 2011. Declines in affordability, higher mortgage rates, higher construction costs and declines in equity prices all slowed the housing sector in 2018.

While a slowdown in the U.S. economy would reduce demand and dampen

growth in the near term, supply shortages have some structural foundations—for example an older demographic of construction workers—that are likely to constrain any overbuilding if the economy continues to expand. **RE**

(This article was published online April 8.)

ENDNOTES

- 1 Headquartered in St. Louis, the Eighth Federal Reserve District includes all of Arkansas and parts of Illinois, Indiana, Kentucky, Mississippi, Missouri and Tennessee.
- 2 See www.nahb.org/en/research/housing-economics/housings-economic-impact/housings-contribution-to-gross-domestic-product-gdp.aspx.
- 3 For more on the effect of student debt on mortgages, see www.federalreserve.gov/publications/files/consumer-community-context-201901.pdf.
- 4 Measured as median house price divided by median family income.
- 5 See Mather and Schlagenhauf.
- 6 There are numerous assumptions in estimating the monthly payment on a home such as down payment amount and interest rate, and the basic premise is that a household can afford to pay 28 percent of its gross income on housing.

REFERENCES

- Mather, Ryan; and Schlagenhauf, Don. "Debt Levels Continue to Grow in Eighth District's Key Metro Areas." *Regional Economist*, March 7, 2019. See www.stlouisfed.org/publications/regional-economist/first-quarter-2019/debt-levels-continue-grow.
- Saiz, Albert. "The Geographic Determinants of Housing Supply." *The Quarterly Journal of Economics*, 2010, Vol. 125, No. 3, pp. 1253-96.

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Debt Levels Continue to Grow in Eighth District's Key Metro Areas

By Ryan Mather and Don E. Schlagenhauf



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

- For the largest metro areas in the Eighth District, the growth rate of mortgage and auto debt picked up in the third quarter of 2018.
- In the third quarter, Memphis, Tenn., saw credit card debt grow faster than the national rate.
- Data on the 90-day delinquency rate do not seem to indicate that a debt problem on the scale of the Great Recession is on the horizon.

In the previous issue of the *Regional Economist*, we introduced some new metrics intended to monitor consumer debt developments at the metropolitan statistical area (MSA) level in the Eighth Federal Reserve District.¹ Since then, the Federal Reserve Bank of New York has updated its Consumer Credit Panel to include data from the third quarter of 2018.

In this article, we examine the new data to see whether any significant developments have occurred either nationally or in the Eighth District's major MSAs. We also report on our efforts to expand the sample of MSAs we are tracking.

National Developments

In the U.S. as a whole, we observe small increases in the year-over-year rate at which consumers were accumulating inflation-adjusted auto and mortgage debt² from the second quarter of 2018 to the third quarter of 2018. Given that these categories represent a large portion of all consumer debt, the rate of total debt accumulation across the nation was also

increasing. However, the rate of credit card debt accumulation declined, and the outstanding amount of home equity line of credit (HELOC) debt continued to decline since the second quarter.

Eighth District MSAs

Debt developments are shown in Figure 1 for the four largest MSAs in our district: St. Louis; Memphis, Tenn.; Louisville, Ky.; and Little Rock, Ark.

Mortgage debt declined significantly following the Great Recession, both nationally and in the Eighth District, but started a sustained increase once again in 2015. In the second quarter of 2018, the growth of mortgage debt looked to be slowing in several MSAs. However, the most recent data suggest that the slowdown was temporary. Nationally, mortgage debt accrual increased from 1.64 percent in the second quarter to 2.54 percent in the third. In the Eighth District MSAs, mortgage debt since 2015 has tended to be below the national trend.

Prior to the Great Recession, the growth rate in HELOC debt exceeded the growth rate in mortgage debt, both nationally and in these District MSAs. In late 2004, the growth rate of HELOC debt in St. Louis and Little Rock was particularly large, actually exceeding the national growth rate in this category. Since around 2010, however, the trend in HELOC debt has largely remained negative for both the national and District MSA economies. Little Rock and Louisville appear to have the greatest volatility in this category.

Nationally, the growth of auto debt peaked before 2005 and declined until early 2010. Between 2010 and 2015, the year-over-year growth rate in auto debt steadily increased. Since that time, however,

auto debt growth has been slowing. Most recently, the declines in auto debt accrual have been greatest in Little Rock, while auto debt growth in Louisville has exceeded national rates.

Credit card debt has the same general pattern in the MSAs as observed in the overall economy. The most recent data show that credit card debt is growing more slowly than the national trend in every District MSA except Memphis.

In Table 1, we present the underlying data by debt category in each of these four MSAs for the second and third quarters of 2018.

A Check on Debt Problems

As we have argued previously, an increase or even a sustained increase in any debt category does not necessarily signal a potential problem as long as debtors demonstrate an ability to repay. To provide clarity, then, in Table 1 we also monitored 90-day delinquency rates by debt category in the various MSAs.³ The idea is that sustained, large increases in both consumer debt and the corresponding delinquency rate are a signal of a possible consumer debt problem. Recall that during the early periods of the Great Recession, the year-to-year growth in the 90-day mortgage delinquency rate began exceeding 1 percentage point nationally and continued to do so for 11 straight quarters. As can be seen in Table 1, year-to-year growth in the 90-day delinquency rate did not come close to exceeding 1 percentage point for any debt category in any of the MSAs examined. Therefore,

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Don E. Schlagenhauf (left) is an economist at the Federal Reserve Bank of St. Louis. His research focuses on macroeconomics and policy, with emphasis on housing. He joined the St. Louis Fed in 2017. Read more about the author and his research at <https://research.stlouisfed.org/econ/schlagenhauf>.

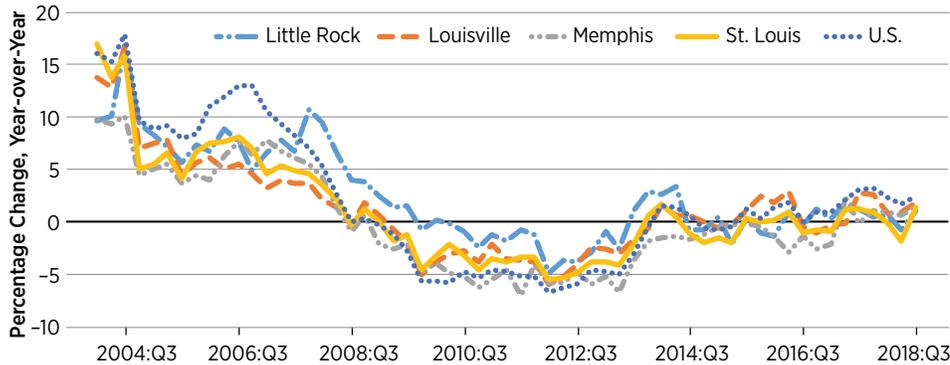
Ryan Mather (right) is a research associate at the Federal Reserve Bank of St. Louis.



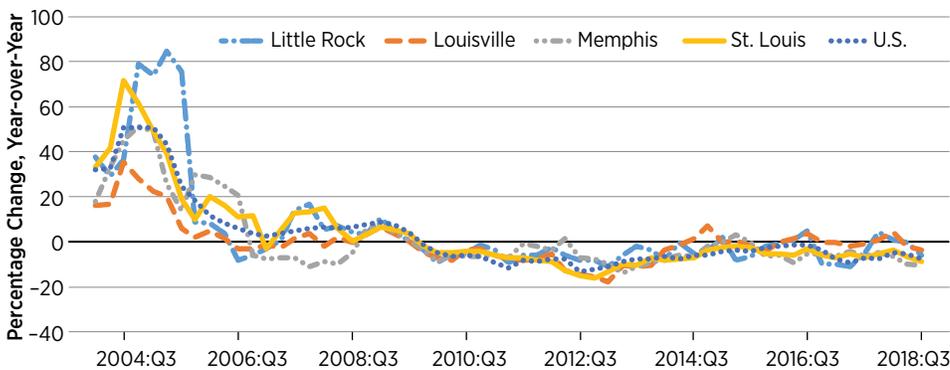
Figure 1

Total Real Consumer Debt by Category

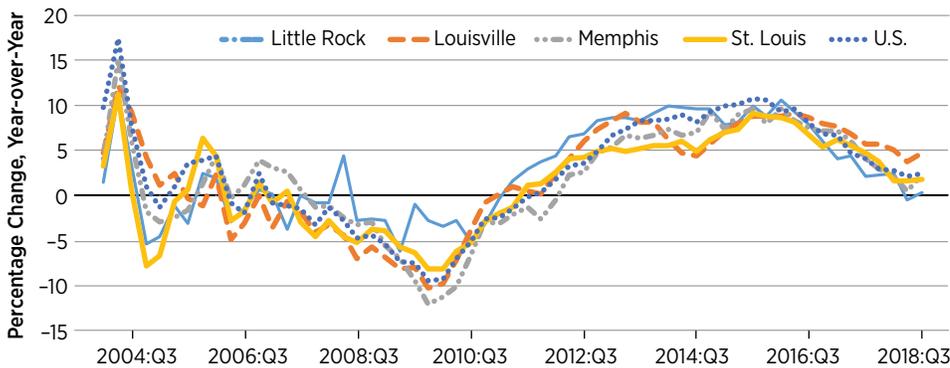
MORTGAGE



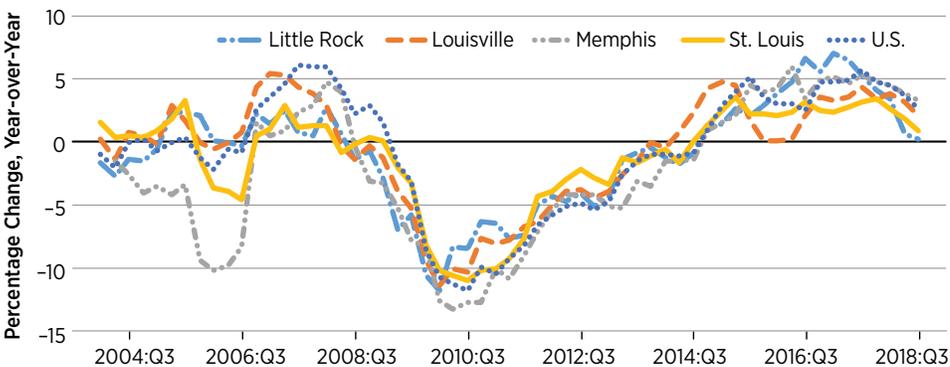
HOME EQUITY LINE OF CREDIT



AUTO



CREDIT CARD



the data do not seem to indicate that another debt problem is on the horizon.

Smaller MSAs in the District

After our previous article, some readers expressed interest in other MSAs of the Eighth District. In response, we constructed a data set for the MSAs of Evansville, Ind.; Fayetteville-Springdale, Ark.; Jackson, Tenn.; and Springfield, Mo. (See Table 2.) There is likely a slight decrease in accuracy for these numbers as compared with those of larger MSAs because of the smaller sample size.

Generally, all these MSAs showed the same national trend of accelerating total debt growth in the third quarter except for Jackson, where the total change in overall debt was actually negative in the third quarter.

We will focus on the Fayetteville-Springdale MSA because it has recently been among the fastest-growing MSAs in the U.S. In the second quarter of 2018, mortgage debt for this MSA declined. In the third quarter, however, mortgage debt increased by 4.29 percent compared with that in the third quarter of 2017, reflecting a strong housing market. In addition, HELOC debt increased by over 4 percentage points in this market for each of the quarters presented here. Credit card and auto debt increased by 4.6 and 6.0 percent, respectively. In all categories, third-quarter debt growth was faster in the Fayetteville-Springdale MSA than the national average change. Delinquency growth rates were below the one percentage point threshold for all categories. ^{RE}

(This article was published online March 7.)

ENDNOTES

- ¹ Headquartered in St. Louis, the Eighth Federal Reserve District includes all of Arkansas and parts of Illinois, Indiana, Kentucky, Mississippi, Missouri and Tennessee.
- ² All data were adjusted for inflation using the personal consumption expenditures chain-type price index.
- ³ We derive the 90-day delinquency rate by dividing the volume of loan payments that are 90 days or more past due by the total volume of loan payments.

SOURCES AND NOTES FOR FIGURE 1 TO THE LEFT

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

NOTES: Data as of Nov. 20, 2018. Debt data were adjusted for inflation using the personal consumption expenditures chain-type price index.

Table 1

Debt Scorecard: Largest MSAs in the Eighth District

Metropolitan Statistical Area	Debt Type	Year-over-Year Percentage Change in Debt		Year-over-Year Percentage Point Difference in Delinquency Rates	
		2018:Q2	2018:Q3	2018:Q2	2018:Q3
Little Rock, Ark.	Mortgage	-0.82%	1.09%	-0.01	-0.05
	HELOC	-0.28%	-5.70%	-0.24	0.19
	Auto	-0.46%	0.26%	0.32	0.47
	Credit Card	0.60%	0.17%	0.78	0.53
Louisville, Ky.	Mortgage	0.99%	1.92%	-0.46	-0.34
	HELOC	-1.81%	-3.52%	-0.58	-0.57
	Auto	3.79%	4.71%	0.24	0.12
	Credit Card	3.11%	2.11%	0.23	0.32
Memphis, Tenn.	Mortgage	0.59%	1.51%	-0.26	-0.40
	HELOC	-9.87%	10.13%	0.04	-0.66
	Auto	0.42%	2.28%	-0.44	-0.04
	Credit Card	3.32%	3.65%	0.31	0.29
St. Louis	Mortgage	-1.87%	1.39%	-0.31	-0.26
	HELOC	-6.32%	-8.86%	-1.09	-0.88
	Auto	1.61%	1.83%	0.30	0.18
	Credit Card	1.76%	0.91%	-0.20	-0.15

SOURCES AND NOTES FOR TABLE TO THE LEFT

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

NOTES: HELOC is home equity line of credit debt. Debt data were adjusted for inflation using the personal consumption expenditures chain-type price index; all data as of Nov. 20, 2018.

Table 2

Debt Scorecard: Smaller MSAs in the Eighth District

Metropolitan Statistical Area	Debt Type	Year-over-Year Percentage Change in Debt		Year-over-Year Percentage Point Difference in Delinquency Rates	
		2018:Q2	2018:Q3	2018:Q2	2018:Q3
Evansville, Ind.	Mortgage	-0.22%	1.81%	-0.37	-0.25
	HELOC	-10.60%	2.16%	0.27	0.16
	Auto	2.14%	0.59%	0.65	0.38
	Credit Card	-0.53%	-0.03%	0.10	0.18
Fayetteville-Springdale, Ark.	Mortgage	-0.12%	4.29%	-0.01	-0.31
	HELOC	4.34%	6.72%	0.22	0.60
	Auto	3.66%	4.64%	0.08	0.13
	Credit Card	8.08%	6.01%	0.04	-0.31
Jackson, Tenn.	Mortgage	1.09%	-4.09%	-0.73	-0.42
	HELOC	4.97%	-11.08%	0.00	0.00
	Auto	4.77%	4.99%	-0.23	-0.02
	Credit Card	6.27%	1.09%	0.94	0.66
Springfield, Mo.	Mortgage	2.83%	4.44%	-0.09	0.05
	HELOC	-5.71%	-5.88%	-0.20	-0.51
	Auto	4.66%	4.65%	0.06	0.07
	Credit Card	1.35%	-1.05%	-0.10	0.19

SOURCES AND NOTES FOR TABLE TO THE LEFT

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

NOTES: HELOC is home equity line of credit debt. Debt data were adjusted for inflation using the personal consumption expenditures chain-type price index; all data as of Nov. 20, 2018.

Headwinds, Tailwinds and Whirlwinds: Forecasting the 2019 Economy

By Kevin L. Kliesen

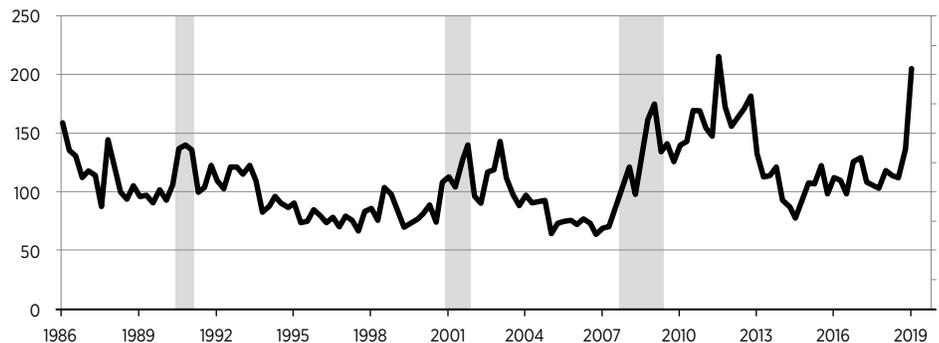


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KEY TAKEAWAYS

- Conflicting data and the partial government shutdown made economic forecasting more challenging at the end of 2018 and the start of 2019.
- Lower oil prices have helped throttle back inflationary pressures in the second half of 2018.
- Though some are worried about a recession, many forecasters expect the U.S. economy to post solid growth in 2019.

U.S. Economic Policy Uncertainty Index



SOURCES: www.policyuncertainty.com and Haver Analytics.

NOTE: The observation for 2019:Q1 uses the reported value for January 2019.

As noted in our article in the previous *Regional Economist*, the U.S. economy appeared to be growing at a solid pace over the final three months of 2018. However, uncertainty about the near-term outlook was rising because of emerging weakness in housing and business investment. Measures of uncertainty rose sharply at the end of 2018 and into early 2019 (see accompanying figure), as a 35-day partial government shutdown—exacerbated by rising trade tensions between the U.S. and China—triggered a modest erosion in consumer confidence and rising levels of financial market distress.

Facing further signs of an emerging global slowdown but comforted by falling oil prices that exerted downward pressure on inflation and interest rates, the Federal Open Market Committee (FOMC) signaled at the conclusion of its Jan. 29-30 meeting that monetary policy was likely to remain in a holding pattern for a while.

All Mixed Up

The partial government shutdown that lasted from late December 2018 to late January 2019 delayed the release of several key economic reports, including the Bureau of Economic Analysis' fourth-quarter advance estimate for real gross domestic product (GDP) and Census Bureau reports on new-home sales, new construction, and orders

and shipments for durable goods. But other government agencies and data-reporting entities were up and running, including the Department of Labor and the Federal Reserve Board. Analyzing the state of the economy at the end of 2018 and into early 2019 was especially challenging.

As the reports on economic activity in November and December began to trickle in, coupled with the regularly scheduled reports on activity in January and early February, it became clear that the economy's momentum had slowed. In view of past unexpected first-quarter slowdowns, this is perhaps unsurprising.¹ Still, the data were mixed. For example, retail sales in December were shockingly—and puzzlingly—weak, despite strong job growth, accelerating wage growth and few indications from retailers that the holiday sales season was nothing short of solid. Then, key data in January portrayed a similar mixture of robust economic conditions (another gangbuster employment report) and very weak conditions (a sharp decline in industrial production). This pattern played out with other key January data: continued low initial

claims for state unemployment benefits but a noticeable dip in light-vehicle sales.

Despite some data contradictions, Fed policymakers took comfort that inflation pressures were throttling back. As measured by the consumer price index, headline inflation (all items) slowed over the second half of 2018 and into January 2019. After reaching a peak of 2.9 percent in July 2018, inflation slowed to a 1.5 percent rate in January 2019 (measured in 12-month percentage changes). A weaker inflation trajectory largely reflected the plunge in crude oil prices over this period from a little less than \$71 per barrel to about \$51.50 per barrel. Lower oil prices translated into falling prices for refined products like gasoline and diesel, helping to bolster the purchasing power of consumers.

Falling inflation rates have also helped to lower market-based measures of inflation expectations, thereby putting downward pressure on long-term nominal interest rates. Lower interest rates, in turn, have spurred a modest uptick in mortgage applications.

Despite the fog of contradictory data, financial market conditions have improved

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markedly since the first of the year. Through mid-February, the Wilshire 5000 stock (equities) price index is up by nearly 13 percent, and the St. Louis Fed's Financial Stress Index has fallen sharply after rising to a roughly two-year high at the end of 2018.

The FOMC Says It Will Be Patient

Some of the rebound in financial sentiment was undoubtedly due to a shift in the stance of monetary policy. At the conclusion of its December 2018 meeting, FOMC policymakers agreed to raise the target range for the federal funds rate by 25 basis points to 2.25 to 2.5 percent, the fourth such increase in 2018. In the Summary of Economic Projections (SEP) released after the December meeting, 11 of the 17 FOMC participants expected at least two more 25 basis point rate hikes by the end of 2019. But with financial distress on the rise in late December and early January, and inflation pressures easing, several Federal Reserve officials—including Chairman Jerome Powell—signaled that they had the luxury of waiting to see how the economy would evolve in 2019. Indeed, in the Jan. 30, 2019, FOMC statement, the committee said that it would be “patient as it determines what future adjustments” may be appropriate.

Although the whirlwinds buffeting the economy have caused some to warn of an impending recession—or, at a minimum, much weaker growth—the domestic economy continues to expand. Indeed, the consensus of the FOMC and professional forecasters is that the U.S. economy will continue to register solid GDP growth and low inflation in 2019. In December's SEP, the median GDP growth estimate among FOMC participants was 2.3 percent. If that GDP forecast bears out, then the current U.S. business expansion will become the longest on record on July 1, 2019. **RE**

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

(This article was published online Feb. 27.)

ENDNOTE

¹ To read more about the issue of residual seasonality, see Owyang and Shell.

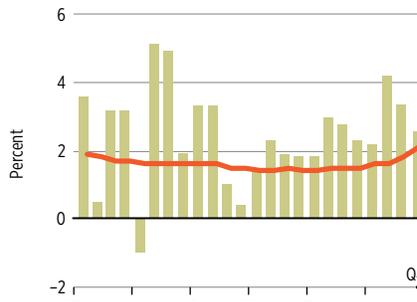
REFERENCE

Owyang, Michael T.; and Shell, Hannah G. “Dealing with the Leftovers: Residual Seasonality in GDP.” *Regional Economist*, Fourth Quarter 2018, Vol. 26, No. 4, pp. 10-11.

ECONOMY AT A GLANCE

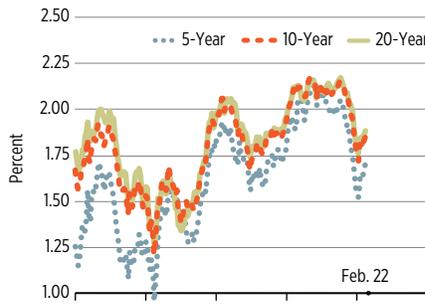
All data as of March 1, 2019

Real GDP Growth



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

Inflation-Indexed Treasury Yield Spreads

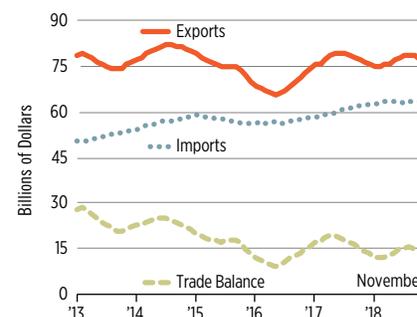


NOTE: Weekly data.

Civilian Unemployment Rate

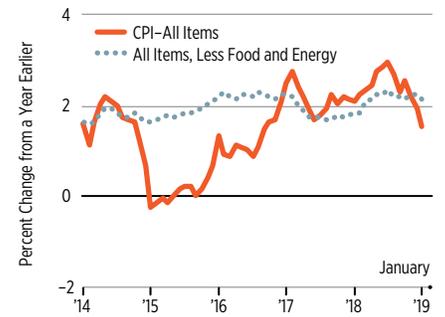


U.S. Agricultural Trade

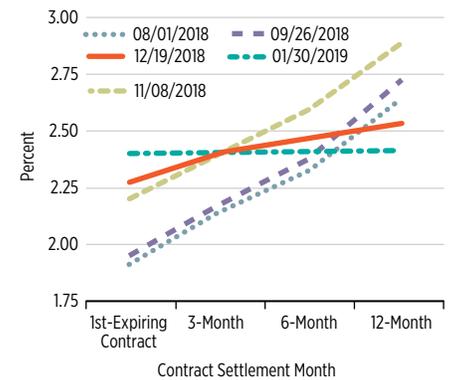


NOTE: Data are aggregated over the past 12 months.

Consumer Price Index (CPI)



Rates on Federal Funds Futures on Selected Dates

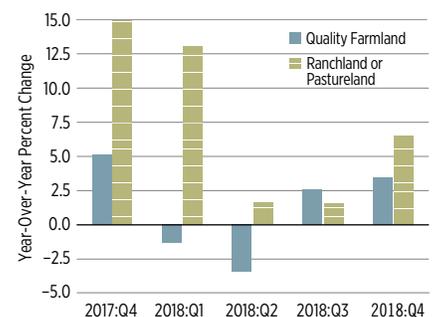


Interest Rates



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).

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.



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