

RE REGIONAL ECONOMIST

Insights on economic issues in today's headlines

How Industrialization Shaped America's Trade Balance

St. Louis Fed President

Some of James Bullard's
key policy presentations
during 2019

PAGE 3

Efficient and Disruptive

New technologies are
transforming the payments
and banking systems

PAGE 12

Immigration

What are some of the
demographic characteristics
of green card holders?

PAGE 14

RE

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IN THIS ISSUE

4

How Industrialization Shaped America's Trade Balance

The U.S. has experienced extended periods of deficits and surpluses in its goods trade balance. These trends appear to be closely linked to stages of U.S. industrialization.



PRESIDENT'S MESSAGE 3

New Payments Technologies Seen Bringing Efficiency and Disruption

New digital technologies are starting to transform the payments and banking systems. 12

Immigration: The Characteristics of Green Card Holders

Immigrants with U.S. permanent resident status, on average, are younger than the U.S. population. 14

The Role of Industry Mix in Regional Business Cycles

The business cycles of states can diverge from the U.S. cycle. Industry mix can help explain why. 16

DISTRICT OVERVIEW

Debt Developments in the Eighth District during First Half of 2019

Student debt generally grew faster in the U.S. and Eighth District than any other debt category. 19

NATIONAL OVERVIEW

Forecasters See Lower U.S. GDP Growth as Headwinds Continue

The consensus of professional forecasters is that real GDP growth will dip below 2% in 2020. 21

ECONOMY AT A GLANCE 22

ONLINE EXTRA

Excluding Housing Costs, U.S. Inflation Is Well Below 2%

Housing costs have been rising fast in recent years. What might this mean for underlying inflation trends?

Read more at stlouisfed.org/re.

A Year in Review

St. Louis Fed President James Bullard has been a participant in Federal Open Market Committee (FOMC) deliberations since April 2008. Bullard actively engages with many audiences—including academics, policymakers, business and community organizations, and the media—to discuss monetary policy and the U.S. economy and to help further the regional Reserve bank's role as the voice of Main Street.

Some of his key policy presentations during 2019 and some of his remarks related to longer-run issues for monetary policy are summarized below. To see more of Bullard's public remarks, please visit stlouisfed.org/from-the-president.

Some Key Policy Presentations

Perspectives on 2019 Monetary Policy

Jan. 10, 2019: In Little Rock, Ark., Bullard noted that U.S. monetary policymakers reacted to the upside surprise in macroeconomic performance during 2017 and 2018 by taking the opportunity to normalize U.S. short-term interest rates. "Market-based signals such as low market-based inflation expectations and a threatening yield curve inversion suggest that this window of opportunity has now closed," he said. He added that the FOMC should heed these signals to keep the U.S. expansion on track for the next several years.

A Successful Normalization, With Challenges Ahead

April 11, 2019: In Tupelo, Miss., Bullard discussed the end of U.S. monetary policy normalization. He said, "The campaign has been largely successful: Nominal short-term interest rates have been raised from near-zero levels, and the size of the Fed's balance sheet has been reduced as the economic expansion has continued." He also discussed the macroeconomic challenges the FOMC faces in 2019.

Remarks on the Current Stance of U.S. Monetary Policy

June 3, 2019: In Chicago, Bullard noted that the U.S. economy is expected to grow more slowly going forward, with some risk that the slowdown could be sharper than expected due to ongoing global



President Bullard speaking in Effingham, Ill., in September.

trade policy uncertainty. He also noted that inflation and inflation expectations remain below the Fed's 2% target and that signals from the Treasury yield curve seem to suggest the policy rate setting is inappropriately high. "A downward policy rate adjustment may be warranted soon to help re-center inflation and inflation expectations at target and also to provide some insurance in case of a sharper-than-expected slowdown," he said.

(Note: While the FOMC left the target range for the federal funds rate unchanged at its June 2019 meeting, Bullard cast a dissenting vote in favor of a 0.25 percentage point reduction at that time. The FOMC did reduce the policy rate by 0.25 percentage points in July and again in September. At the September meeting, Bullard cast a dissenting vote in favor of a 0.5 percentage point reduction instead.)

Insurance against Downside Risk for the U.S. Economy

Oct. 15, 2019: In London, Bullard noted that the U.S. economy continues to face downside risk due to weakness in the global economy and trade policy uncertainty. This risk may cause a sharper-than-expected slowdown, which may make it more difficult for the FOMC to achieve its 2% inflation target. He pointed out that the FOMC has tried to help insure against this downside risk by dramatically altering the path of monetary policy. "The FOMC has taken actions that have changed the outlook for shorter-term U.S. interest rates considerably over the last 11 months, ultimately providing more accommodation to the economy," he said.

(Note: In late October, the FOMC reduced the policy rate by 0.25 percentage points.)

Remarks on Longer-Run Issues for Monetary Policy

James Bullard Discusses Nominal GDP Targeting


April 19, 2019: Bullard noted that inflation targeting has been successful in keeping inflation low and stable. The question now is whether a different approach might be even better. In this podcast, he discussed some advantages and disadvantages of using nominal GDP (NGDP) targeting. "The biggest advantage is this idea that you would really cement inflation expectations around the target," he said.

Nominal GDP Targeting as "Optimal Monetary Policy for the Masses"

May 3, 2019: During a policy panel at a conference hosted by the Hoover Institution at Stanford University, Bullard discussed his working paper (co-authored with Riccardo DiCecio). The paper examines whether monetary policy can be conducted in a way that benefits all households even in a world with substantial income, financial wealth and consumption inequality. In the paper, NGDP targeting constitutes "optimal monetary policy for the masses."

"I am hopeful that the results reported here will stimulate more research and that ideas related to price-level targeting and NGDP targeting will continue to gain influence in actual monetary policy deliberations," he said.

Bullard Discusses the Fed's Monetary Policy Framework Review

Aug. 14, 2019: The Federal Reserve is reviewing its monetary policy strategies, tools and communications in 2019. In this podcast, Bullard explained that it is best practice among central banks to review their policymaking framework on a regular basis. He noted this provides an opportunity to think about changes that might be made outside of the normal policy cycle. "I think it's very useful to try to do as much as you can in good times so that when bad times come again, you've at least got some basis to go ahead and make decisions," he said. 

(This article was published online Nov. 26.)

How Industrialization Shaped America's Trade Balance

By Brian Reinbold and Yi Wen



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KEY TAKEAWAYS

- The state of the U.S. trade balance appears closely linked to stages of the country's industrialization.
- America's changing economic structure affected its comparative advantage relative to those of other countries, which is a key determinant of trade patterns.
- The persistence of trade deficits may be related to the willingness of foreigners to hold U.S. financial assets.

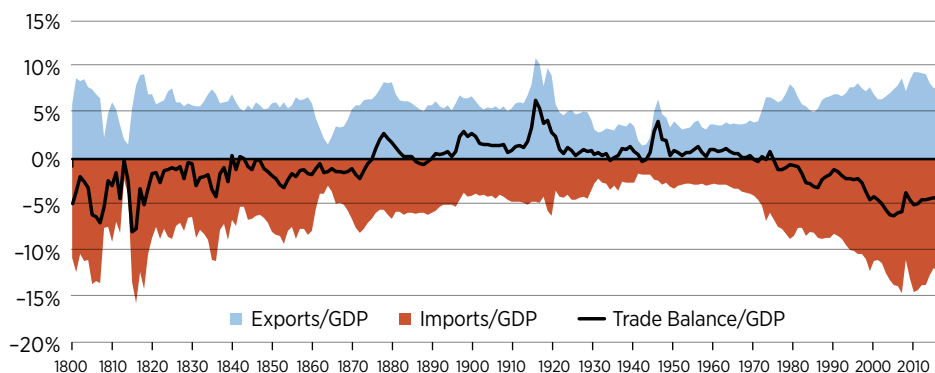
Many Americans worry about the current size of the U.S. trade deficit. Yet relatively large trade deficits have been persistent during much of the country's existence.

In an *Economic Synopses* published by the Federal Reserve Bank of St. Louis in May 2019, we broadly examined the link between industrialization and historical U.S. trade flows. In this article, we take a closer look at how industrialization may have affected the composition of U.S. trade and why certain trade patterns persisted in U.S. history.

Figure 1 shows the U.S. goods trade balance as a percentage of gross domestic product (GDP) from 1800 to 2018.¹ From 1800 to 1870, the U.S. ran a trade deficit for all but three years, and the trade balance averaged about -2.2% of GDP. Then from 1870 to 1970, the U.S. ran persistent trade surpluses that averaged about 1.1% of GDP. Around 1970, the country began to run trade deficits again, which have continued to this day. These shifts in the long-term U.S. trade balance appear to correspond well with U.S. industrialization in a global setting.

Figure 1

U.S. Goods Trade Balance as a Percentage of GDP



SOURCES: U.S. Bureau of Economic Analysis, World Trade Historical Database, measuringworth.com and authors' calculations.

Historically, industrialization has three phases: (1) the first industrial revolution features labor-intensive mass production of light consumer goods, such as processed food and textiles; (2) the second industrial revolution features capital-intensive mass production of heavy industrial goods, such as steel, machinery, equipment and automobiles; and (3) the welfare revolution features mass consumption in a service-oriented welfare state.

We hypothesize that different phases of industrialization lead to structural changes that cause a nation's comparative advantage to change relative to those of other nations. Since countries trade based on their comparative advantage, we would expect to see long-term changes to a country's trade as it enters a new stage of development. Therefore, the long-term trends in Figure 1 can best be understood in the context of U.S. development.

Phase 1 (1800-1870)

As Europe, led by Great Britain, began to industrialize in the late 18th century, the U.S. remained primarily agrarian. U.S. industrialization began in the early 19th century, focusing on labor-intensive manufacturing, such as textiles. As a latecomer to industrialization and thus

playing catch-up with Europe, the U.S. still had to import many manufactured goods, including machinery and other capital goods, and the country relied on the exports of crude materials, such as cotton. Europe produced manufactured goods more cheaply, and the U.S. could not yet match Europe's prolific innovations. As a result, the U.S. ran trade deficits in several classes of manufactured goods. (See figures in the sidebar on page 6.)

Figure 2 shows the breakdown of U.S. trade by two aggregate classes of goods: raw materials and manufactured goods. The category of raw materials is the sum of crude materials (e.g., coal, petroleum and cotton) and crude foodstuffs (e.g., grains, produce, coffee and tea). The category of manufactured goods is the sum of manufactured foodstuffs (e.g., meat, sugar and processed fruits), semimanufactures (e.g., lumber, refined copper, and iron and steel plates) and finished manufactures (e.g., textile manufactures, machinery, equipment, automobiles and their parts, metal and steel, chemicals, and radios).

We see that the U.S. ran large deficits in manufactured goods throughout most of the 19th century, although the country showed a declining trend after the Civil War. Furthermore, the breakdown of trade

We hypothesize that different phases of industrialization lead to structural changes that cause a nation's comparative advantage to change relative to those of other nations.

ABOUT THE AUTHORS

Yi Wen (left) is an economist and assistant vice president at the Federal Reserve Bank of St. Louis. His research interests include macroeconomics and the Chinese economy. He joined the St. Louis Fed in 2005. Read more about the author and his research at <https://research.stlouisfed.org/econ/wen>.

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



Commodities Composition of U.S. Historical Trade

Figure 2 is the trade balance of two commodity aggregates: raw materials and manufactured goods. Figures 3 and 4 show the U.S. goods composition of exports and imports for several classes of commodities: crude materials, crude foodstuffs, manufactured foodstuffs, semimanufactures and finished manufactures. Together these three figures clearly demonstrate how industrialization affected the composition of U.S. trade and the overall trade balance.

The main takeaway is that finished manufactures drove the U.S. trade balance from 1821 to 1970. Producing finished manufactures requires a certain level of manufacturing sophistication and therefore represents a high level of industrialization. From 1821 to 1870, the U.S. was less industrialized, so it imported significantly more finished manufactures than it exported, driving overall trade deficits. However, after 1870, the U.S. became increasingly more developed relative to Europe and thus was less reliant on imports of finished manufactures, and exports of finished manufactures steadily increased. Ultimately, finished manufactures drove America's overall trade surpluses that persisted until the 1970s.

Figure 2

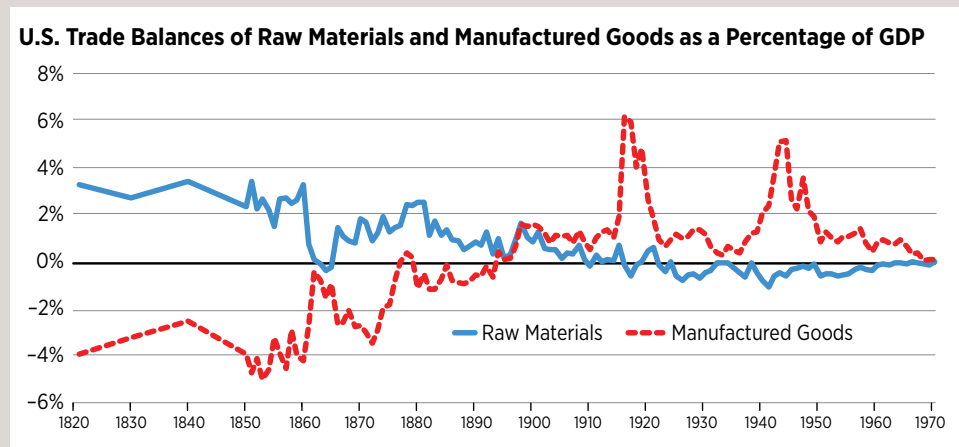


Figure 3

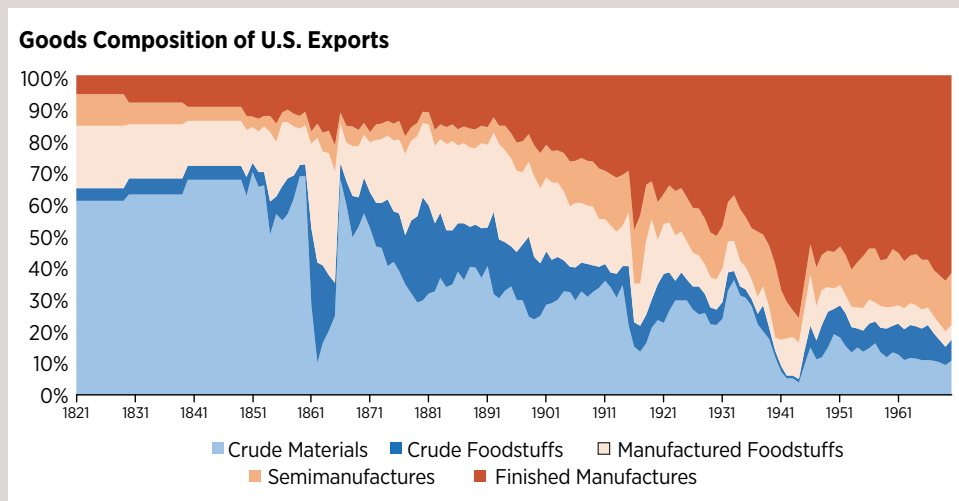
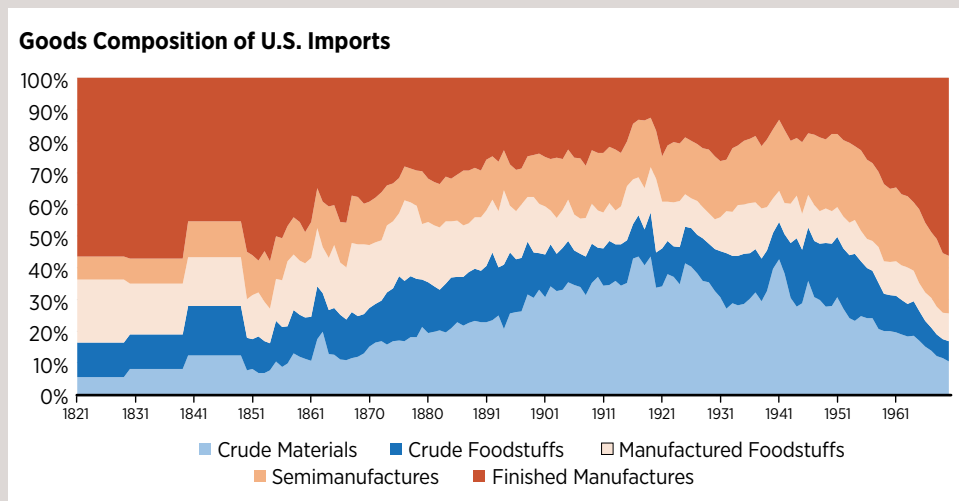


Figure 4



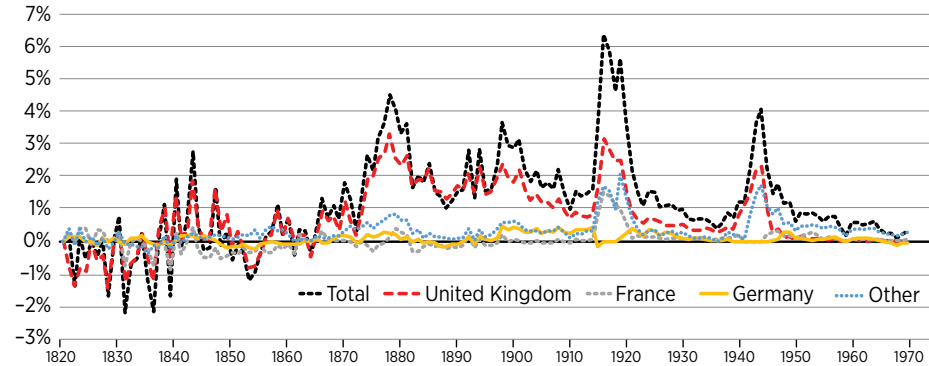
Sources and notes for Figures 2, 3 and 4

SOURCES: U.S. Census Bureau, 1975; measuringworth.com; and authors' calculations.

NOTE: Data end in 1970.

Figure 5

U.S. Goods Trade Balance with Europe as a Percentage of GDP



SOURCES: U.S. Census Bureau, 1975; measuringworth.com; and authors' calculations.

in manufactured goods gives us insight into the progress of U.S. industrialization. (See Figures 3 and 4.)

From 1821 to 1870, the U.S. posted slight deficits in manufactured foodstuffs and semimanufactures and substantial deficits in finished manufactures. Manufactured foodstuffs (i.e., processed food) typically is the first sector to industrialize as it can be accomplished with little capital and lots of labor—perfect for early industrialization. Subsequently, semimanufactures generally require more capital and sophisticated manufacturing processes to transform raw materials into products useful for other industrial processes. Finally, finished manufactures require significant amounts of capital and maturation of other manufacturing processes to be viable; therefore, they represent a high level of industrial sophistication.

The U.S. at this time lagged behind Europe in manufacturing and thus was more reliant on imports of finished manufactures. So the U.S. stage in development relative to those of other industrial nations led the country to run deficits in manufactured goods. The composition and size of the manufactured goods trade deficits exemplify the United States' relative industrial development.

Since European countries were the only other industrialized economies at this time, the U.S. had to import manufactured goods from that continent. This was particularly true for finished manufactures because European countries were the only nations further along in their industrial development to possess the

manufacturing sophistication necessary to fabricate these goods. Figure 5 shows the U.S. goods trade balance with Europe as a percentage of GDP.

Trade with Europe was primarily driven by trade with Great Britain: The U.K. represented around 60% of total U.S. trade (the sum of exports and imports) with Europe and around 40% of overall trade throughout most of the 19th century. The close historical ties between the U.S. and the U.K. made them natural trading partners.

Furthermore, trade with the U.K. would be essential for America's own industrialization. Since the U.K. was the first country to industrialize, that country could produce more capital-intensive goods at lower cost than the U.S., so the U.S. would have to rely on imports to satisfy demand for manufactured goods.

We see that the U.S., on average, ran deficits with Europe from 1821 to 1840. So the U.S. likely imported a significant amount of capital goods and manufactured goods from the U.K. and the rest of Europe during this period to spur its own industrialization. Although the U.S. initially ran deficits with Europe, the trade balance fluctuated from deficit to surplus from 1840 to 1870. The U.S. imported manufactured goods from Europe, while Europe relied on raw materials from the resource-rich U.S. to sustain its own industrialization.

Phase 2 (1870-1970)

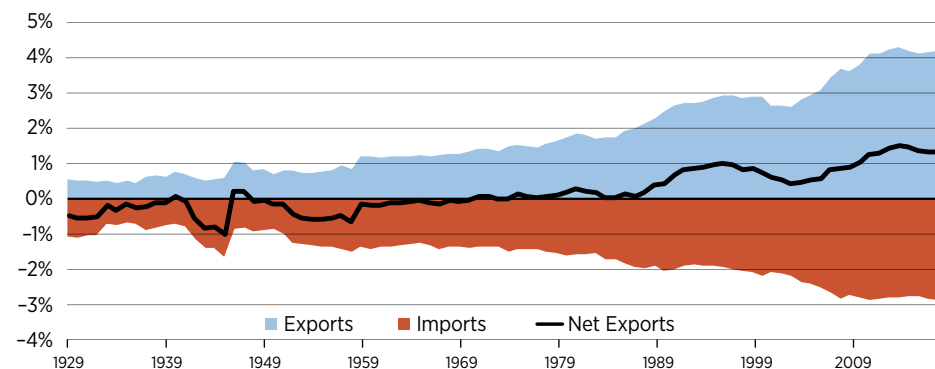
U.S. consumers benefited from imported manufactured goods, and furthermore, the country could import



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Figure 6

U.S. Services Trade Balance as a Percentage of GDP



SOURCES: U.S. Bureau of Economic Analysis, Haver Analytics and authors' calculations.

capital goods to facilitate its own industrialization. By 1870, improved manufacturing methods and the proliferation of railroads propelled the U.S. into the second phase of industrialization, which featured capital-intensive mass production of manufactured goods and machinery. This shift corresponds with a turning point in the U.S. trade balance—from persistent trade deficits to persistent trade surpluses. (See Figure 1.)

Increased sophistication and maturation of U.S. manufacturing drove this change as the country relied less on imports of manufactured goods, and exports of manufactured goods increased. In 1869, the U.S. imported three times as many manufactured goods as it exported, but by the turn of the century, the United States—now a manufacturing powerhouse—ran a full-fledged surplus in manufactured goods. (See Figure 2.) Furthermore, when we look at the composition of manufactured goods, we see how U.S. industrialization affected the country's trade balance during this period.

The U.S. began to run persistent trade surpluses in manufactured foodstuffs by the mid-1870s. The U.S. at this point had well-developed labor-intensive manufacturing and thus was less reliant on imports and could export more of these goods. Furthermore, the U.S. trade deficit in finished manufactures shrank considerably in the 1870s, which was exceptionally important in shrinking the country's overall trade deficit. The shrinking deficit in finished manufactures exemplifies America's increasing sophistication in manufacturing capital-intensive goods. In

1898, the U.S. began to run consistent surpluses in finished manufactures, signifying the nation as a global industrial powerhouse.

Returning to Figure 5, we also see a noticeable upward shift in the overall U.S. trade balance with Europe starting in the early 1870s. The average U.S. trade balance with Europe from 1821 to 1870 was essentially zero but rose to a surplus of about 1.7% of GDP from 1870 to 1970.

Although the U.S. began to run trade surpluses with Europe prior to 1870, the key takeaway is the shift in level. The year 1870 marks a turning point in the country's relative comparative advantage with Europe. The U.S. entered the capital-intensive phase of industrializing and was then quickly catching up to Europe's manufacturing prowess. The U.K. capital per worker was 10% higher than U.S. capital per worker in the 1870s, but by 1900, the U.S. ratio was 90% higher (i.e., more capital intensive) than that of the U.K. In addition, the U.K. accounted for 43% of world manufactured exports in the mid-1880s, whereas the U.S. accounted for only 6%. By 1913, however, the U.K. share of manufactured exports had fallen to 32%, while the U.S. share had more than doubled.²

Instead of just following Europe's industrialization, the U.S. became a leading innovator, and its manufacturing prowess rapidly caught up to the rest of Europe. Ultimately, the U.S. relied less on imports of manufactured goods from Europe, and its manufacturing exports flourished, which resulted in trade surpluses that persisted until 1970.

Phase 3 (1970-Present)

Since the 1970s, the U.S. has shifted to the welfare stage, featuring credit-based mass consumption with financial innovations. This shift implies that the country became able to consume more tangible goods than it produced by providing services (such as consulting and financial services) to the world.

During the early 1970s, the U.S. goods trade balance experienced another inflection point—from trade surpluses to trade deficits. (See Figure 1.) Again, this shift also corresponded with a structural change in the economy as the U.S. entered this third stage of development.

Figure 6 shows the U.S. trade balance in



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services from 1929 to 2018.

Starting in 1970, the U.S. services trade balance qualitatively mirrors the country's goods trade balance: The trade balance in services goes from persistent deficits to continuously increasing surpluses, while the trade balance in goods goes in the opposite direction. Also, the volume of U.S. trade in services has nearly tripled since 1970, demonstrating the country's global comparative advantage in providing services. In addition, we find that the U.S. began to run trade deficits in goods with Europe after 1980 and that the U.S. has been running trade surpluses in services with Europe since 1999 (the first year that data are available).

Other Factors Affecting the Trade Balance

The U.S. ran persistent trade deficits for long periods of its history, just as it does today. Yet, trade deficits did not inhibit U.S. development and may have even facilitated industrialization as the country imported capital goods to improve its own manufacturing during this first phase of industrialization.

We use our theory of global shifting of relative comparative advantage to explain these long-run shifts in the level of the U.S. trade balance. We saw how industrialization affected the composition of U.S. exports and imports, and how relative development could affect trade balances with other nations (namely Europe). One

caveat to our hypothesis is that it is not clear how industrialization necessarily results in deficits or surpluses.

Clearly, industrialization affects the composition of goods that a nation can produce, which then affects what goods that nation can trade (e.g., a country cannot export cars if it cannot produce them). However, this does not necessarily imply trade deficits or trade surpluses. According to the national accounting identity, net exports are the difference between gross savings and gross investment.³ Therefore, industrialization has to affect gross savings or gross investment to affect the trade balance, but this mechanism is not obvious.

Furthermore, it's clear how comparative advantage drives the pattern of observed trade, but comparative advantage does not necessarily explain why these deficits or surpluses persisted in each phase. For example, when the U.S. runs a persistent trade deficit (as we see in Phase 3), foreigners are willing to exchange goods for U.S. financial assets, such as U.S. dollars and U.S. securities, and are willing to hold these financial assets for prolonged periods of time. Why are foreigners satisfied with holding on to U.S. financial assets instead of exchanging them for U.S. goods?

Phase 3 corresponds with a unique development in the international financial system: the end of the Bretton Woods system and the rise of the U.S. dollar as the world reserve currency. Essentially, the U.S. dollar became as good as gold,

It's clear how comparative advantage drives the pattern of observed trade, but comparative advantage does not necessarily explain why these deficits or surpluses persisted in each phase.



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and foreigners have been willing to hold U.S. dollar securities as a safe store of value, leading to persistent trade deficits in Phase 3.⁴ Extending this logic to the previous phases, gold was useful for settling international transactions, and the precious metal also served as a safe store of value.

This logic implies that the U.S. must have experienced persistent net outflows of gold during Phase 1 and persistent net inflows of gold during Phase 2. Indeed, the historical data reveal net outflows of gold from the U.S. during the early 19th century and net inflows of gold to the U.S. during the early 20th century. So during Phase 2, the U.S. likely accumulated and maintained large holdings of gold as a safe store of value, resulting in persistent trade surpluses. Phase 1 mostly saw gold flowing out of the U.S., and foreigners were willing to hold on to this gold. Another possible factor that sustained the U.S. trade deficits during Phase 1 is that foreigners were willing to hold U.S. land as a safe store of value.

To summarize, each phase may have corresponded with a financial asset serving as a safe store of value (gold and land in Phase 1, gold in Phase 2, and the U.S. dollar in Phase 3), and others were willing to hold these assets in each phase, which ultimately led these trade patterns to persist for many decades.

Conclusion

Trade is complicated, and further research is needed to better understand these long-term historical trends. Studying both changes in the U.S. industrial composition and how this may affect savings, investment and the holdings of financial assets can help build a complete picture of what factors drove the historical U.S. trade balance.

However, it seems reasonable to expect that transitioning into different stages of industrialization will cause structural changes in an economy, including changes in a country's comparative advantage relative to those of other nations. And comparative advantage is the driving force behind international trade. So not all developing countries will follow the same pattern (i.e., from trade deficit to surplus, back to deficit), but we would expect to see long-run shifts in overall trade balances as a nation develops. RE

(This article was published online Feb. 6.)

ENDNOTES

- ¹ The periods of all graphs are dictated by data availability.
- ² See Kitson and Michie.
- ³ This idea follows from the national account identity that gross domestic product (GDP) is the sum of consumption, investment, government spending and net exports ($Y = C + I + G + NX$). Gross savings are defined as GDP minus consumption and government spending ($S = Y - C - G$). Then by rearranging the national accounting identity with the definition of gross savings, we obtain the relationship that net exports are equal to national savings minus investment ($NX = S - I$). Therefore, a nation runs a trade deficit when savings are less than investment ($S < I$) and runs a trade surplus when savings are greater than investment ($S > I$).
- ⁴ See Reinbold and Wen, 2018, for more details.

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Insights from the St. Louis Fed's Blogs

On the Economy blog (stlouisfed.org/on-the-economy)



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Rising Student Debt and the Great Recession

Graduate students and four-year undergrads have taken on an increasing fraction of annual student loans, as tuition and fees have continued to climb and students have spent more years in college.

"Average annual borrowing among students at two-year colleges increased by nearly 50% during the recession, double the contemporaneous rise in enrollment levels. Four-year college students also took on substantially more debt immediately before and during the recession, thereby also contributing to the overall debt growth."

—Oksana Leukhina, Senior Economist

stlouisfed.org/on-the-economy/2020/january/rising-student-debt-great-recession



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Healthier Countries, if Not Wealthier Countries

The gap between rich and poor countries seems to be widening. But the health of these poorer countries seems to be catching up to their wealthier counterparts.

"In 1960, the [crude death] rate in sub-Saharan countries was more than double that of the high-income countries. It then declined remarkably faster than in the high-income countries, which experienced a barely noticeable decline. By 2017, the crude death rate was the same in both groups of countries."

—Guillaume Vandenbroucke, Research Officer and Economist

stlouisfed.org/on-the-economy/2019/december/healthier-countries-wealthier-countries

FRED Blog (fredblog.stlouisfed.org)



Working 9 to 5: Women Make Up More of the Workforce

A look at women in the workforce by sector

"It looks like the employment share of women has increased or at least persisted in sectors where women have achieved a strong presence. But it doesn't seem like women are increasing their share in every given sector. Economists call this the composition effect."

—Diego Mendez-Carbajo, Senior Economic Education Specialist

fredblog.stlouisfed.org/2020/01/working-9-to-5-women-make-up-more-of-the-workforce

Inside FRASER blog (insidefraser.stlouisfed.org)



Dismal Facts: Invisible Revisions

Policymakers use the best data available to them, which is often revised after the fact. This Inside FRASER explores how data revisions can complicate research of historical economic policy.

"Ultimately, the data collection process in economics will always be a little imperfect. Unlike the physical sciences like chemistry or physics, in economics we typically can't gather data from controlled experiments, so our data is inherently a bit messy."

—Andrew Spewak, Senior Research Associate, and Genevieve Podleski, Senior Analyst

insidefraser.stlouisfed.org/2020/01/invisible-revisions

New Payments Technologies Seen Bringing Efficiency and Disruption

By Alexander Monge-Naranjo



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KEY TAKEAWAYS

- Digital technologies have begun to transform the payments and banking systems, but the final impact of the change is far from determined.
- However, faster payments are here to stay, and the new payments technologies will disrupt legacy deposit and payments franchises.
- The level of disruption on incumbents will depend on the structure of their legacy business and on their response in adopting the new technologies.

Digital technologies have changed the way we buy clothing, book trips, and schedule our work and social gatherings. Once considered eccentric and even snobbish alternatives to the established way of doing business, websites and smartphone apps have come to dominate our daily activities and transactions.

Not surprisingly, these same technologies have also begun transforming the payments and banking systems. As when shopping for shoes or getting airplane tickets, consumers are set to benefit from greater convenience, higher speed and lower costs when searching for products and making and receiving payments.

Quite likely, the new payment methods will trigger greater competition for funds, and thus households will end up earning higher returns on their deposits. As for merchants, their benefits may arise from faster access to sales revenues and from lower interchange fees. Some of the existing banks—and some new entrants as well—may contribute to the adoption of technologies by offering more open and efficient access to the payments system.

The identity and even the nature of the new dominant mechanisms for the payments and banking systems are far

from determined yet. Innovation can be divided broadly along two related dimensions: the adoption of faster, more efficient payment systems, and the introduction and adoption of digital currencies or cryptocurrencies.

For both, as briefly reviewed in this article, the possibilities are ample. (See, for example, the accompanying figure, explained below.) At this point, however, only two things are certain. The first is that faster payments are here to stay. The second is that along with more efficiency, the new payments technologies will also disrupt profitable legacy deposit and payments franchises. These disruptions have already been seen in the retail industry, where the adoption of online technologies has led to the observed widespread closures of brick-and-mortar stores.

Banks that are unable or unwilling to upset their business models may be doomed to downsize and even be left behind completely. Central banks around the globe are increasingly aware of the potential disruptions to incumbent commercial banks, and they are responding in different ways.

Evolving Means of Payments

The payments system has been evolving in two broad dimensions: (1) through changes in the set and efficiency of the mechanisms available to transfer funds and (2) through the emergence of crypto or digital currencies, which has led to a substantial innovation in the currencies available to make transactions.

With respect to the first, improved efficiency in the mechanisms for making and receiving payments has been introduced by private banking and nonbanking institutions, as well as central banks, resulting in

upgrades and faster speed of bank account-based payment networks.

As discussed by multiple authors,¹ the world has moved from the standard two to three business days required to clear a check to a global standard of fast payments with near real-time availability of the funds for payees on a 24/7 basis.

For example, consider a parent who needs to pay for a child's violin lessons. Paying through a traditional bank account, the parent would write a check to the violin instructor. For the money to be finally deposited into the instructor's account, the bank of the parent's account first has to be debited, and then the money has to be transferred to the violin teacher's bank, which finally has to deposit the money into the teacher's account. Such a transaction could take two or even three days, plus the time it takes the instructor to go to the bank. With digital technologies, the payment can be done almost instantaneously with just a couple of clicks using apps such as Venmo, PayPal, Apple Pay or Google Pay.

The adoption of those payment systems is widespread, reaching countries in very different stages of development. For example, Swedish private mobile payment system Swish and the Korean Electronic Banking System are well rooted in these developed countries. The Mexican SPEI and the Costa Rican SINPE are both managed seamlessly by the respective central banks of these two developing countries. All in all, those payment systems allow households and businesses that register and install the required apps to quickly transfer and receive payments, circumventing the need for commercial banks to clear their checks.

Relative to using checks or carrying cash, these new technologies offer

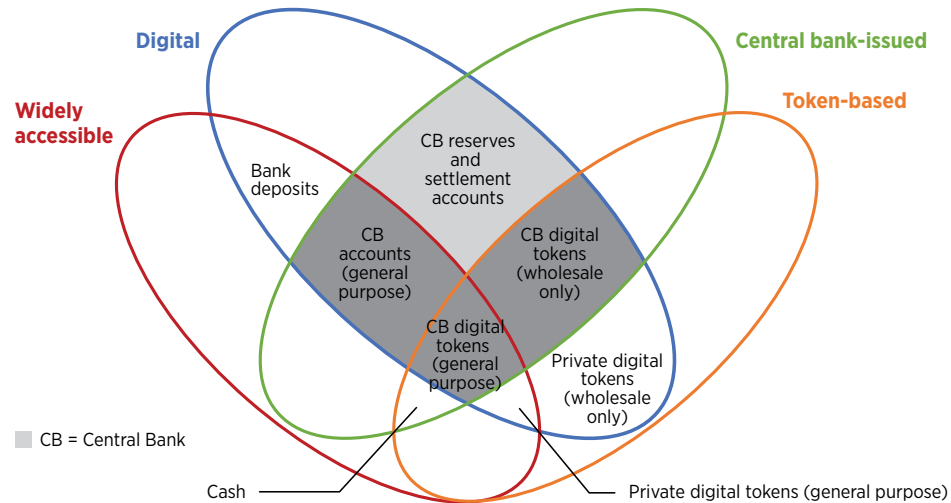
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Figure 1

The Money Flower



SOURCE: Committee on Payments and Market Infrastructures (CPMI) and Markets Committee.

advantages—such as time savings, logistics and accounting—that can be substantial for both the payers and the receivers. For banks and other intermediaries in the business of clearing payments, these advances can require a redirection of their activities and, quite possibly, a reduction in their employment.

Digital Currencies

Similarly, the development, introduction and diffusion of multiple cryptocurrencies have received much attention from the private sector and central banks across the globe.² To analyze the emergence of these new forms of money, economists Morten Bech and Rodney Garratt have proposed a typology of money, the so-called “money flower,” classifying currencies by whether they are digital, whether they are central bank-issued, whether they are widely accessible and whether they are token-based.³

The accompanying figure reproduces a version of Bech and Garratt’s money flower, as modified by the Committee on Payments and Market Infrastructures (CPMI) and the Markets Committee; this is a simple Venn diagram that summarizes the different forms of money that can be arise. While departing from traditional monetary theory in its focus on the circulation velocity and frequent-use-in-payments criteria for defining and understanding money,⁴ Bech and Garratt’s money flower helps map the possible forms of money that will be used in the near future.

On the one hand, we have very traditional categories, such as cash, which are token-based money that is widely accessible and nondigital. On the other hand, we have central bank reserves and settlement accounts, which are nontoken-based, digital, and available only to financial intermediaries.

A category of particular interest is that of private digital tokens. As shown by the figure, they can be either wholesale only or widely accessible. Also, depending on the form of their ledger technology, they can be “permissioned” (i.e., maintained by a trusted third party), such as Ripple and Corda, and others can be open or “permissionless,” such as Bitcoin and Ethereum. Which ones of these cryptocurrencies, if any, will eventually dominate the global payments system—or major components of it—is hard to predict at this point and the subject of interesting debate.⁵

Disruption in Payments and Banking Industries

The improved efficiency brought about by the new payments technologies will likely bring some disruption in existing banking markets. As with other markets, the level of disruption will depend on the response of incumbent banks to the new technologies as well as the structure of their legacy business.

Using data from a study by consulting firm McKinsey & Co., Darrell Duffie argues that the disruption for incumbent

banks will be quite different between North America (U.S. and Canada) and the rest of the world.⁶ In North America, the major sources of disruption will be in the segments of consumers’ credit cards and domestic transactions. Much of the usage of credit cards is for convenience of payment and not for credit, and U.S. banks rely more heavily on the credit card interchange and payment fees than foreign banks do. For the rest of the world, the major disruptions will be on the commercial segments, specifically on the revenue from account-related liquidity and domestic transactions.

In any event, the overall disruption of the new technologies may be dampened by two forces. First, the finance industry has historically been among the fastest in adopting technological changes. Hence, it is expected that incumbent banks have long been preparing themselves. Second, with the low inflation and low interest rate environment observed in most countries lately, the costs of liquidity are also historically low. Hence, the pressure to substitute away from existing media of payments is also low. **RE**

Qiuhan Sun, a research associate at the Bank, provided research assistance.

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ENDNOTES

- ¹ For example, see Duffie.
- ² See CPMI and Markets Committee.
- ³ See Bech and Garratt.
- ⁴ See the extensive discussion by Townsend.
- ⁵ David Andolfatto of the St. Louis Fed has written extensively on topics of cryptocurrencies, including their implications for policy. Interested readers in the topic should look into his thoughts about these issues at <http://andolfatto.blogspot.com/2017/12/my-perspective-on-bitcoin-project.html>.
- ⁶ See Duffie.

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Immigration: The Characteristics of Green Card Holders

By Subhayu Bandyopadhyay and Asha Bharadwaj



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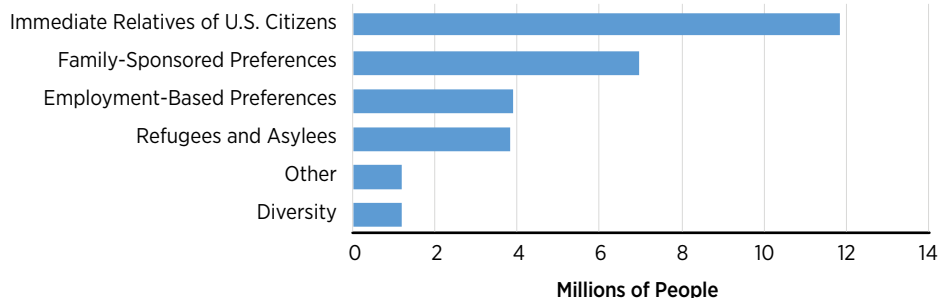
KEY TAKEAWAYS

- From 1989 to 2017, Mexico was the largest source of U.S. lawful permanent residents, or green card holders. Other big sources were China, the Philippines and India.
- While many green cards are given to family members of U.S. citizens and permanent residents, a large number also go to skilled workers.
- Green card holders, on average, are younger than the overall U.S. population. They could help support an aging U.S. population in the future.

Figure 1

Who Obtained Permanent Resident Status?

By Type of Admissions, FY 1986 to FY 2017



SOURCES: U.S. Department of Homeland Security and authors' calculations.

NOTES: The annual periods are the U.S. government's fiscal years. People in the diversity category are randomly selected from applicants who are from countries with relatively low rates of immigration to the U.S.

One of the pillars of the U.S. immigration system is its permanent residency program. More commonly, immigrants in this category are known as green card holders.¹ A key feature of this program is that the green card holder has authorization to work and stay indefinitely in the U.S. as long as certain requirements are met. A central long-term feature of this program is that it provides a pathway to citizenship, in which the person can apply to become a naturalized U.S. citizen after a number of years of residence.

In addition to benefiting the immigrant, these features present costs and benefits for society at large. For industries suffering a shortage of workers, a program like this can provide much-needed relief through the supply of a permanent and potentially skilled workforce. On the other hand, if the program creates a glut in certain labor markets, outcomes for natives could worsen.

Looking into the future, the U.S. sees a large fraction of its workforce nearing retirement (i.e., the baby boomers). The permanent residency program, especially in the case of green card holders who are at working age or younger, contributes workers who can pay into the Social Security system to sustain the elderly.

Clearly, the more we know about the characteristics of green card holders that are relevant to such economic outcomes, the better we can infer about the effects of legal immigration on the U.S. economy. Accordingly, this article looks into some relevant characteristics of U.S. green card holders based on available evidence.

The Allocation of Permanent Resident Status

The U.S. Immigration and Nationality Act of 1965 and subsequent legislation established worldwide annual limits on the number of immigrants to be granted permanent residency. Immediate relatives of U.S. citizens (e.g., spouse, parents or children under the age of 18) and refugees are exempted from this limit. For the rest,

there are preference categories and annual national origin limits.²

Figure 1 shows that by far the largest number of green cards since fiscal year 1986 through fiscal year 2017 was given to immediate relatives of U.S. citizens. This is followed by the category of family-sponsored preferences, which includes the adult children of U.S. citizens and the spouses and children of green card holders. Employment-based preferences garnered the third-largest number of green cards; this category is designed to attract a talented and skilled workforce to the country, with the highest preference given to outstanding professors and researchers, among others. This was followed by several other categories, including refugees and asylees.

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Origin Nations of Permanent Residents

Mexico is the largest source nation of permanent residents, with nearly 171,000 green cards given to people born in Mexico in 2017.³ Mexico has been the leading source of lawful permanent residents (LPRs) every year since fiscal year 1989, accounting for 20.5% of those receiving this status; 1989 is the earliest year for which we could get data related to source nations. However, the share of green cards received by Mexican nationals in the last 10 years, from 2007 to 2017, is lower (14.4%) compared with the overall share from 1989 to 2017. China (5.7%), the Philippines (5.4%), India (5.3%) and the Dominican Republic (3.6%) follow Mexico as the major sources of LPRs over the 1989-2017 period.

Occupations of U.S. Permanent Residents

The accompanying table provides occupational details of the green card holders in fiscal year 2017. Excluding the “unknown” category, for which information is absent, the largest category is students or children at 23.6%, followed by homemakers at 12.7%. This makes sense considering the fact that immediate relatives of U.S. citizens (i.e., spouses and dependent children) are automatically eligible for permanent residency. Furthermore, a green card holder’s spouse and dependent children get preference in receiving green cards. The category of management, professional and related occupations is 10.1% of the total, which reflects to some degree the preference given to skills in the allocation of green cards.

Age Profile of Green Card Holders

The fact that the largest category in the accompanying table (excluding the category of unknown) comprises students and children is encouraging from an economic dependency standpoint; today’s students can contribute to a skilled future workforce that can pay into the Social Security system. Delving deeper into this issue, we present Figure 2. Around 22% of the total number of permanent residents in fiscal year 2017 were younger than 20, which is comparable with the 25.2% share of this age group in the total U.S. population. This group will gradually enter

Permanent Residents by Occupation, FY 2017

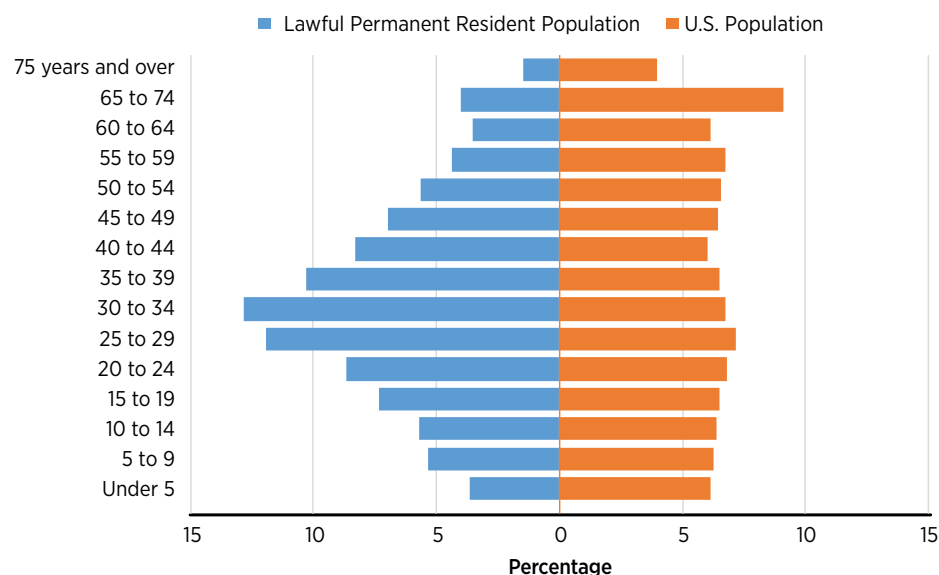
	People	Percentage
Students or Children	266,526	23.6%
Homemakers	143,149	12.7%
Retirees or Unemployed	115,889	10.3%
Management, Professional and Related Occupations	114,218	10.1%
Production, Transportation and Material-Moving Occupations	42,745	3.8%
Sales and Office Occupations	41,284	3.7%
Service Occupations	28,021	2.5%
Construction, Extraction, Maintenance and Repair Occupations	12,867	1.1%
Farming, Fishing and Forestry Occupations	12,594	1.1%
Military	44	0.0%
Unknown	349,830	31.0%
TOTAL	1,127,167	

SOURCES: U.S. Department of Homeland Security and authors’ calculations.

NOTE: The annual period is the U.S. government’s fiscal year.

Figure 2

Age Groups as a Share of Population, FY 2017



SOURCES: U.S. Department of Homeland Security and authors’ calculations.

NOTE: The annual period is the U.S. government’s fiscal year.

working age and contribute to future U.S. national income.

The group older than 54 represents around 13.4% of permanent residents, compared with 25.9% for that age group within the total U.S. population. The older members of this group are already retired or will start retiring in the coming years, adding—all things being equal—to the

nation’s dependency burden. Therefore, the fact that the share of this group among green card holders is smaller than the corresponding share for the U.S. as a whole is encouraging in terms of the nation’s future dependency burden.

(continued on Page 23)

The Role of Industry Mix in Regional Business Cycles

By Charles S. Gascon and Jacob Haas



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KEY TAKEAWAYS

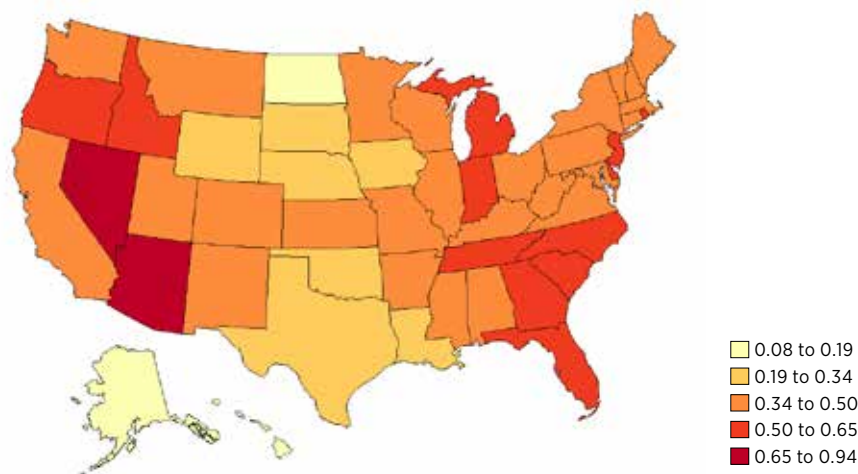
- The business cycles of individual U.S. states can diverge from the national cycle. Industry mix within those states can help explain why this may happen.
- Certain industries, like construction, tend to be the more responsive to national expansions and recessions. Other sectors, like government, are less responsive.
- Understanding how differences in industry composition affect regional business cycles may help local leaders better tailor their policies to downturns and expansions.

The U.S. has been in an economic expansion for more than 10 years, adding over 21 million workers to payrolls since June 2009 and seeing a 2.3% average annualized increase in real gross domestic product (GDP) each quarter. The expansion was preceded by a recession that lasted from December 2007 to June 2009, during which time over 7 million workers were dropped from payrolls and real GDP fell by an average annualized rate of 2.6% each quarter. Expansions and recessions like these are two stages of what economists call the business cycle, which is often marked by coinciding movements in economic indicators like employment and GDP.¹

While the nationwide business cycle is important, the U.S. is not a uniform country, and research has shown that different regions have varying business cycles. Economists Michael Owyang, Jeremy Piger and Howard Wall found that U.S. states experience significantly different growth rates, and sometimes they may not even be in the same phase of the business cycle as each other at the same time. The authors found that some states, like Maryland in the mid-1990s, fell into a recession not connected at all with a national recession.

Figure 1

Responsiveness of State Nonfarm Employment to Changes in U.S. Real GDP



SOURCES: Bureau of Labor Statistics, Bureau of Economic Analysis and authors' calculations.

NOTES: Data are correlations of the change in state employment and the change in U.S. real GDP from the first quarter of 1990 to the second quarter of 2019. Changes in data are annualized and taken from quarter-to-quarter. The average state employment responsiveness to U.S. real GDP is 0.42, which means the average state would experience a 0.42% change in employment for every 1% change in U.S. real GDP. Each color grouping represents 1 standard deviation, except for the first and last groupings, which extend to the minimum and maximum values.

Other states were in recession months before the national economy reached that stage, or remained in a recession long after the nation entered an expansionary phase. Missouri, for example, switched into a recession in August 2000, seven months prior to the start of a national recession.

State Business Cycles and Industry Mix

A basic way to measure the movements of state business cycles in relation to the national cycle is to see how a change in U.S. GDP or U.S. employment would affect each state. Figure 1 shows the relation between

a change in U.S. real GDP and each state's employment levels.

States whose employment levels fluctuate more when overall GDP changes will appear as more sensitive or responsive to the national cycle. For example, when U.S. real GDP has changed by 1%, Nevada has seen an average change in employment that is double the national average change in employment.² The District of Columbia, by comparison, has seen an employment change less than one-fifth the national average for every 1% change in U.S. real GDP. Some states in the western and southeastern parts of the country have higher

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rates of sensitivity to the national business cycle, while many states in the Great Plains seem to be less sensitive.³

One component driving these differences in regional business cycles could be the types of jobs available in a given area.

Certain industries are more sensitive to economic expansions and recessions. Because industries often cluster by geography, there is potential for disparities in employment growth between areas with different industry makeups. For example, states with higher employment rates in the energy industry, like Texas, will react differently to oil price shocks than other states, which can result in these states being out of sync with the national economy. According to a 2016 study by Maria Arias, Charles Gascon and David Rapach, the technology hubs of San Francisco and San Jose suffered relatively severe recessions in the early 2000s after the dot-com bubble burst, while other California metro areas like Riverside and Sacramento avoided recessions altogether during that period.

The accompanying table gives a simple measure of the sensitivity or responsiveness of certain industries to the national business cycle for the 1990-2019 period. Industries whose employment levels fluctuate more when overall GDP changes correspond to higher sensitivity numbers. When U.S. real GDP changes by 1%, U.S. construction employment changes by 1.4% on average, while government employment sees a much smaller change of 0.1%.

Since 1990, U.S. employment in construction, professional and business services,⁴ and manufacturing tends to be the most responsive to national expansions and recessions. Meanwhile, employment in government, education and health care, and utilities tends to be the least responsive to U.S. expansions and recessions.

Because states have different industry mixes, they will have different employment levels in the more cycle-sensitive industries. Figure 2 displays the percentage of state employment in the three most sensitive industries: construction, professional and business services, and manufacturing. In Michigan, these three industries make up about 33% of all employment, while they employ only 17% of workers in Alaska. Many states located in the eastern part of the Midwest and southeastern parts of the U.S. have relatively high employment shares in these sensitive industries.

Responsiveness of U.S. Industry Employment to Changes in the National Economy

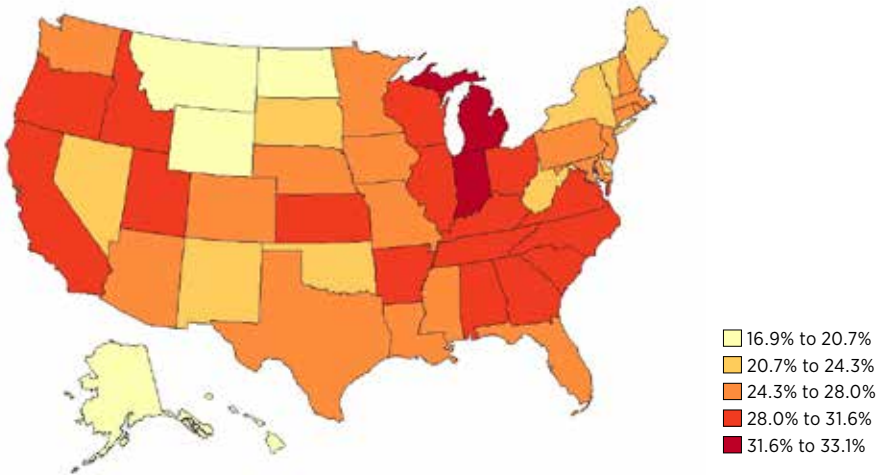
	Responsiveness to Change in U.S. Real GDP	Responsiveness to Change in Total U.S. Employment	Percentage of Total U.S. Nonfarm Employment (2019:Q3)
Construction	1.4	3.0	5.0
Professional and Business Services	0.9	1.8	14.2
Manufacturing	0.7	1.8	8.5
Information	0.6	1.5	1.9
Transportation and Warehousing	0.5	1.5	3.7
Wholesale Trade	0.5	1.2	3.9
Retail Trade	0.5	1.1	10.4
Total Nonfarm	0.4	1.0	100.0
Financial Activities	0.4	0.8	5.7
Leisure and Hospitality	0.4	0.9	11.0
Mining and Logging	0.3	1.1	0.5
Other Services	0.2	0.6	3.9
Government	0.1	0.1	14.9
Education and Health Services	0.0	0.0	16.1
Utilities	-0.2	-0.2	0.4

SOURCES: Bureau of Labor Statistics, Bureau of Economic Analysis and authors' calculations.

NOTES: The first column indicates the change in employment in an industry that correlates to a percent change in U.S. real GDP from 1990 to 2019. For example, construction employment will average a 1.4% change for every 1% change in U.S. GDP. The second column indicates the response of industry employment to a 1% change in total U.S. nonfarm employment for the same time period. The third column is the percentage of total nonfarm employment for the given industry. Changes in employment and GDP are annualized and are quarterly-to-quarterly.

Figure 2

Employment Share in Most Responsive Industries by State



SOURCES: Bureau of Labor Statistics and authors' calculations.

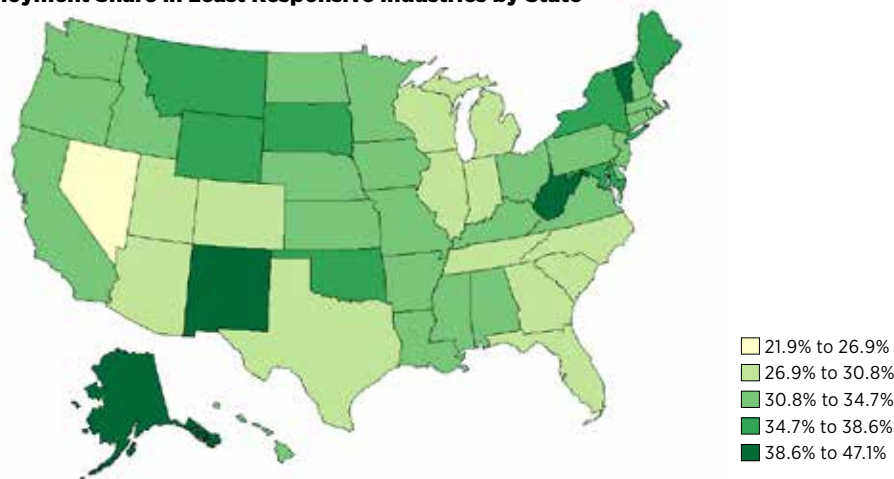
NOTES: This map displays the state employment share in the three industries whose employment levels are the most sensitive to the change in U.S. real GDP—construction, professional and business services, and manufacturing. Employment data are for 2018. The average state share of employment in high-responsiveness industries is 26.2%.

Conversely, some states have higher employment levels in low-sensitivity industries. Figure 3 displays the percentage of

state employment in the three least sensitive areas: government, education and health services, and utilities. Many Northeastern

Figure 3

Employment Share in Least Responsive Industries by State



SOURCES: Bureau of Labor Statistics and authors' calculations.

NOTES: This map displays the state employment share in the three industries whose employment levels are the least sensitive to the change in U.S. real GDP—government, education and health services, and utilities. Employment data are for 2018. The average state share of employment in low-responsiveness industries is 32.8%.

states have high employment shares in less sensitive industries, which may subdue these states' responses to fluctuations in national economic conditions. Nevada has the lowest level of low-sensitivity employment in the U.S., which might have been one factor in why its sensitivity rate in Figure 1 is so high.

Taken together, the employment shares of high-sensitivity and low-sensitivity industries explain about half of the variation in state responsiveness to changes in U.S. real GDP,⁵ indicating that industry mix can play a significant part in how state economies move with the national business cycle.

A Closer Look at the Eighth District

The Eighth Federal Reserve District⁶ has a few states with relatively higher sensitivities—Indiana, Kentucky and Tennessee are all above the national level of employment sensitivity to GDP changes. Arkansas, the least sensitive state in the District to the business cycle, is about 16% less sensitive to U.S. real GDP than the national average in aggregate.

The share of manufacturing employment in Indiana, Kentucky and Tennessee may help explain their elevated sensitivity levels. Indiana employs 17.2% of its workers in manufacturing, which is more than double the national level of 8.5%, while Kentucky and Tennessee have manufacturing employment shares of 13.1% and 11.5%, respectively. While these three states have relatively high

employment shares in this highly sensitive industry, none have a combined employment share in the lowest-sensitivity industries above the national level, which may have furthered the cycle sensitivity of these states.

Conclusion

There are significant differences in the makeup of employment by industry across the U.S. Some states will have much of their economy based in highly sensitive industries like construction, professional and business services, and manufacturing. Other states will rely more on less sensitive industries, with more workers in government, education and health services, and utilities.

It is useful to understand how these differences in industry mix affect regional business cycles, especially when trying to determine which areas may need the most support during recessions or which areas will experience more growth during expansions. Employment shares in high-sensitivity and low-sensitivity industries can help explain some, but not all, of the variation in state business cycles and their relation to the national cycle.

Understanding the industry mix in an area is just one step to being more cognizant of the diversity of the U.S. and its economic composition. The correlative analysis done here provides a basic understanding of business cycle responsiveness

but fails to account for other economic factors. Regions have different education levels, housing supply characteristics, urban population shares and establishment sizes—all of which can affect their local business cycle or comovement with the national cycle.⁷ RE

(This article was published online Jan. 3.)

ENDNOTES

- ¹ The National Bureau of Economic Research (NBER) researches and establishes exactly when the peaks and troughs of a business cycle in the U.S. have occurred. For example, the NBER determined that a trough in business activity occurred in June 2009, marking the end of the Great Recession and the beginning of the subsequent expansionary period.
- ² Since 1990, Nevada has seen an employment change of 0.93% for every 1% percent change in U.S. GDP, while the U.S. in aggregate has seen an employment change of 0.45% for every percent change in U.S. GDP. Nevada far outpaces the next most responsive state, Arizona, which has a responsiveness of 0.695%. Nevada employs over 25% of its workers in the leisure and hospitality industry, well above the national average of 11%. While this industry is not very responsive to U.S. GDP on a national level, local conditions in this industry could make this industry more responsive on a state level. Nevada leisure and hospitality changes by 0.91% for each percent change in U.S. GDP, while the national level of this industry changes by only 0.35%.
- ³ The employment levels for every state were positively correlated with national GDP and employment, indicating the importance of the national business cycle when looking at state business cycles.
- ⁴ The professional and business services sector includes areas such as business and legal support services, temporary-help services, office administrators, building services workers, management workers, and other professional and support services.
- ⁵ This value was obtained from the adjusted R² of a regression of annualized change in U.S. real GDP on employment shares in the three highest-sensitivity and lowest-sensitivity industries.
- ⁶ Headquartered in St. Louis, the Eighth Federal Reserve District includes all of Arkansas and parts of Illinois, Indiana, Kentucky, Mississippi, Missouri and Tennessee.
- ⁷ This is according to the 2016 study by Maria Arias, Charles Gascon and David Rapach, as well as a 2009 study by Michael Owyang, David Rapach and Howard Wall. Additionally, certain state economies and business industries will influence the national GDP trends more than others because of how large they are, causing a reciprocal relationship between state employment and U.S. GDP and potentially biasing our correlative results. For example, a downfall in the California economy has a high likelihood of affecting overall U.S. GDP simply because of how large the GDP and population of the state are, which would lead to a higher sensitivity measurement.

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Debt Developments in the Eighth District during First Half of 2019

By Ryan Mather and Don Schlagenhauf



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KEY TAKEAWAYS

- Inflation-adjusted debt levels in the U.S. and Eighth District nearly returned to their Great Recession peaks over the first half of 2019.
- Student debt generally grew faster in the U.S. and Eighth District than any other debt category.
- Among the District's four largest metro areas, the delinquency rates of student loans and auto debt are historically high.

The Great Recession taught us that developments in household debt markets need to be monitored. In previous *Regional Economist* articles, we have done so by examining auto, consumer credit card, mortgage and home equity line of credit (HELOC) debt using developments observed in the Federal Reserve Bank of New York's Consumer Credit Panel (CCP).¹

This present article complements that work by reporting on updated CCP data for the first half of 2019. In doing so, we consider an additional category of debt that has recently garnered significant attention: student loans. An important new finding will be the rise in 90-day delinquency rates for auto debt across key Eighth District metro areas.

Debt Developments in the First Half of 2019

Since 2013, total household debt has steadily increased in both the U.S. and the Eighth Federal Reserve District.² In fact, midyear debt levels in 2019 for these two

Table 1

Debt Scorecard for the U.S. and Eighth District

	United States				Eighth District			
	Year-over-Year Percentage Change		90-Day Delinquency Rate		Year-over-Year Percentage Change		90-Day Delinquency Rate	
	2019:Q1	2019:Q2	2010:Q1	2019:Q2	2019:Q1	2019:Q2	2010:Q1	2019:Q2
Auto	2.93%	3.07%	4.59%	4.28%	2.51%	2.19%	3.98%	4.45%
Credit Card	2.80%	3.44%	12.76%	7.84%	1.99%	2.26%	10.89%	7.56%
Home Equity Line of Credit	-9.32%	-8.78%	3.36%	1.08%	-8.84%	-6.46%	1.13%	0.63%
Mortgage	1.29%	2.53%	7.68%	0.79%	0.82%	2.48%	3.77%	0.71%
Student Loans	4.41%	4.07%	8.73%	11.18%	3.59%	2.77%	9.39%	13.87%
Total (Including Student Loans)	1.59%	2.47%			1.32%	2.20%		

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

NOTES: Debt data were adjusted for inflation using the personal consumption expenditures chain-type price index; data as of Aug. 13, 2019.

areas were at 92.8% and 99.5%, respectively, of their peak levels during the Great Recession.

Table 1 focuses on the data by type of debt for the first and second quarters of 2019 as well as the first quarter of 2010; this 2010 reference corresponds to the peak of mortgage delinquency in our sample.

During the first half of 2019, auto and credit card debt grew in the range of 2% to 4% in all cases, with both the U.S. and Eighth District experiencing slight upticks in credit card debt accrual from the first quarter to the second.

Mortgage debt accrual saw stronger increases over this time frame, which is significant given that it represents the largest portion of household debt. HELOC debt has continued its declining trend.

Student debt consistently increased in

the U.S. and Eighth District more than any other debt category. It is interesting to note, however, that the Eighth District was taking on student loans at a slower rate compared with the nation over the first half of 2019.

Eighth District MSA Developments

From a business perspective, recent household debt developments in a metropolitan statistical area (MSA) are likely to be more useful. In this section, we use the recorded ZIP codes in CCP reports to identify household debt developments in the Little Rock, Ark.; Louisville, Ky.; Memphis, Tenn.; and St. Louis MSAs. The resulting data for the first two quarters of 2019 are presented in Table 2.

Three things stand out. First, Louisville was the only MSA we tracked with a growth rate in auto debt that was higher than the national average in the second quarter. This is not a new development; auto debt growth rates in Louisville

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Table 2

Debt Scorecard for Eighth District MSAs

Metropolitan Statistical Area	Debt Type	Year-over-Year Percentage Change in Debt		90-Day Delinquency Rate		
		2019:Q1	2019:Q2	2019:Q1	2019:Q2	2010:Q1
Little Rock, Ark.	Mortgage	-0.83%	1.37%	0.78%	0.69%	3.14%
	Home Equity Line of Credit	-2.70%	2.00%	0.56%	0.54%	1.34%
	Auto	-0.84%	0.28%	6.04%	5.83%	3.75%
	Credit Card	-0.62%	1.21%	9.03%	8.95%	10.28%
	Student	3.56%	2.11%	14.49%	14.21%	10.66%
Louisville, Ky.	Mortgage	-2.40%	2.54%	0.98%	0.76%	4.13%
	Home Equity Line of Credit	-17.77%	-5.70%	1.03%	0.77%	0.77%
	Auto	4.21%	4.68%	4.28%	4.27%	3.20%
	Credit Card	2.03%	2.32%	6.16%	6.16%	9.79%
	Student	4.70%	3.79%	14.23%	12.81%	7.90%
Memphis, Tenn.	Mortgage	-0.44%	0.96%	1.23%	0.93%	5.74%
	Home Equity Line of Credit	-11.45%	-10.26%	0.39%	0.47%	0.94%
	Auto	2.47%	2.70%	6.75%	6.68%	6.62%
	Credit Card	4.88%	5.75%	8.61%	8.36%	12.75%
	Student	6.10%	4.42%	14.34%	14.19%	11.71%
St. Louis	Mortgage	1.63%	3.30%	0.69%	0.63%	3.81%
	Home Equity Line of Credit	-12.41%	-11.45%	0.87%	0.83%	1.40%
	Auto	3.28%	2.42%	3.73%	3.71%	3.31%
	Credit Card	2.35%	2.94%	6.64%	6.44%	10.30%
	Student	2.06%	2.19%	12.36%	12.41%	7.97%

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

NOTES: Debt data were adjusted for inflation using the personal consumption expenditures chain-type price index; data as of Aug. 13, 2019.

have been above the national average each quarter for the past three years.

Second, all four areas showed stronger growth in mortgage debt in the second quarter of 2019 than in the first, mirroring the national trend.

Finally, the year-to-year growth in student loans is again generally higher than other categories of debt presented in Table 2 for each area and quarter. The biggest exception to this statement is St. Louis, where the growth rates have slowed somewhat. The largest increases in student debt occurred in the Memphis area.

What is the Message from Delinquency Rates?

So long as debtors continue to repay their debt, an increase in any debt category does not necessarily signal a problem. One way to measure this ability to repay is to examine 90-day delinquency rates³ in the first two quarters of 2019 and compare them with those in the first quarter of 2010.

In Table 2, mortgage delinquency rates at the peak ranged from 3% to 6%. The second-quarter mortgage delinquency rates have not exceeded 1% in any of the four MSAs, however. In stark contrast, delinquency rates for auto debt have surpassed the reference rate and prior historical data

in every MSA for each of the last two quarters. More importantly, auto debt levels are still increasing in most of these MSAs.

Credit card debt has also been on the rise in the Eighth District. However, the corresponding delinquency rates do not raise as much concern. Even with a slight increase in credit card delinquency rates across the District since 2014, these rates remain low compared with our 2010 reference point and prior historical data.

Lastly, student debt delinquency rates have been on the rise for a number of years. In the second quarter of 2019, Table 2 indicates that the 90-day delinquency rates on student debt ranged from 12.41% in St. Louis to 14.21% in Little Rock. These rates are substantially higher than the rates observed in the first quarter of 2010 and earlier, especially for St. Louis.⁴ RE

(This article was published online Nov. 26.)

ENDNOTES

- ¹ The Federal Reserve Bank of New York's Consumer Credit Panel (CCP) is based on an anonymized 5% sample of credit files for the U.S. economy, provided by the credit monitoring company Equifax. In this article, all CCP data were adjusted for inflation using the personal consumption expenditures chain-type price index.
- 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 The 90-day delinquency rate is found by dividing the volume of loan payments 90 or more days past due by the volume of loan payments.
- ⁴ In the third quarter of 2011, the CCP began changing the way it reported student loans, and we noticed a seemingly discontinuous increase in student loan delinquency rates thereafter, which lasted through the end of 2012. Even if we subtract away the increases that occurred during that time from current delinquency levels, however, the present delinquency rates are still higher for student loans in every MSA but Memphis, which is approximately at the 2010 reference level. Note also that student loans are unique among the types of debt we track because the government is often directly facilitating the loan, so in this case the Great Recession does not provide as clear a precedent for how a debt crisis might unravel.

Forecasters See Lower U.S. GDP Growth in 2020 as Headwinds Continue

By Kevin L. Kliesen



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KEY TAKEAWAYS

- Though the pace of real GDP growth has slowed this year, there are few signs that the longest U.S. expansion is on its last legs.
- The consensus of professional forecasters is that real GDP growth will dip below 2% in 2020.
- Real GDP growth in 2020 could rise above 2% if the economy's headwinds—trade disputes and slowing global growth—were to diminish.

After showing considerable strength in the first quarter of 2019, the pace of real gross domestic product (GDP) growth has since slowed modestly. Labor market conditions remain healthy, as the number of job openings continues to outpace the number of unemployed people. By contrast, inflation—as measured by the all-items personal consumption expenditures price index (PCEPI)—has remained low; through September, the inflation rate was about 0.5 percentage points below the 2% inflation target of the Federal Open Market Committee (FOMC).

Although the U.S. economy is exhibiting trend-like growth, many businesses continue to face brisk headwinds related to the trade tussle with China and slowing global growth. To help mitigate these threats, the FOMC has reduced its federal funds target range by 75 basis points this year; the range is now 1.50% to 1.75%. Still, the consensus of professional forecasters is that real GDP growth will dip below 2% in 2020 and that inflation will

modestly firm closer to the Fed's target rate. (See accompanying table.) But if the headwinds facing the economy diminish, then modestly stronger growth is possible in 2020.

Good Times, Unsettled Times

The U.S. economy remains in record-setting territory, entering its 125th month of expansion on Nov. 1. The pace of real GDP growth has slowed from a 3.1% annual rate in the first quarter to a 2% growth rate in the second quarter, and then to a 1.9% growth rate in the third quarter. But there are few signs that the expansion is on its last legs. Indeed, if anything, the current growth rate is consistent with the economy's potential rate of growth—which most economists estimate to be between 1.75% and 2%.

The economy's recent performance is built on some pillars that look reasonably sturdy and some pillars that exhibit troubling cracks. Worrisomely, the pace of business capital expenditures (fixed investment) is the pillar that looks the shakiest. Weak business fixed investment tends to be a signal that firms see impediments to profitably deploying their scarce resources. And since the domestic manufacturing sector is an important provider of capital goods to firms, slowing business fixed investment leads to fewer orders and reduced activity at the nation's factories. Thus, weaker capital spending has potentially important implications.

In the current macroeconomic environment, there are two main impediments facing many manufacturing and non-manufacturing firms as well as farmers:

What Are Professional Forecasters Predicting for 2019-2020?

	Actual	Forecast	
Percent Change (Q4/Q4)	2018	2019	2020
Real GDP	2.5	2.2	1.8
PCE Price Index	1.9	1.5	1.9
Percent (Average, Q4)			
Unemployment Rate	3.8	3.6	3.7

SOURCES: Federal Reserve Bank of Philadelphia and Haver Analytics

NOTE: Forecasts are from the fourth-quarter Survey of Professional Forecasters.

increased tariffs and slower global growth. These two developments have increased costs, trimmed profit margins and reduced sales to overseas markets (i.e., exports).

By contrast, the U.S. consumer remains the economy's strongest pillar. The strength in consumption reflects several factors—most notably labor market conditions. Monthly gains in nonfarm payrolls have averaged slightly less than 170,000 thus far in 2019, helping to drive the unemployment rate to its lowest level in roughly 50 years. Nominal wage growth has remained around 3% over the past year, which translates into solid real wage gains of about 1.5% after accounting for inflation. The latter is broadly consistent with the underlying pace of labor productivity growth. But consumption spending has also been boosted by continued solid gains in household wealth—driven by double-digit gains in equity prices and steady increases in house prices.

The economy has also received a boost from other areas. Notably, residential housing construction (fixed investment) has rebounded modestly; in the third quarter, it contributed positively to real GDP growth for the first time in about

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two years. The FOMC's rate cuts have provided a kick-start to the mortgage market and the housing industry.

Real GDP growth has also received a boost from government expenditures, as federal government outlays are on pace this year to be the strongest in a decade. Moreover, the St. Louis Fed's Financial Stress Index indicates that financial conditions remain supportive for continued gains in economic activity.

Available data in October and November point to real GDP growth of around 2% in the fourth quarter of 2019. Thereafter, real GDP growth will slow a bit further next year and dip below 2%, according to the Survey of Professional Forecasters consensus. Forecasters also see a roughly 1 in 3 probability of a recession developing in 2020 or 2021, according to the Blue Chip consensus. But if the impediments noted earlier diminish, the FOMC's insurance cuts could trigger a rebound in economic activity that pushes real GDP growth back above 2%.

Conflicting Inflation Signals

Inflation pressures and inflation expectations generally remain subdued, thanks to energy prices declining over the past year. Measured from four quarters earlier, the headline (all items) consumer price index (CPI) was up by 1.8% in the third quarter, while the headline PCEPI was up by 1.4%. By contrast, core CPI inflation—which excludes energy and food prices—rose by 2.3% in the third quarter, which was the largest increase in 11 years. However, the core PCEPI increased only by 1.7% in the third quarter from a year earlier. Financial market participants, as well as the St. Louis Fed's Price Pressures Measure, continue to see a low probability of a sizable increase in inflation over the medium term. **RE**

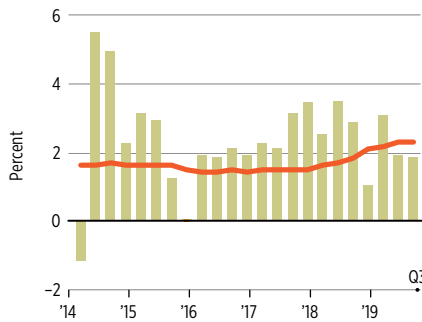
Kathryn Bokun, a research associate at the Bank, provided research assistance.

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ECONOMY AT A GLANCE

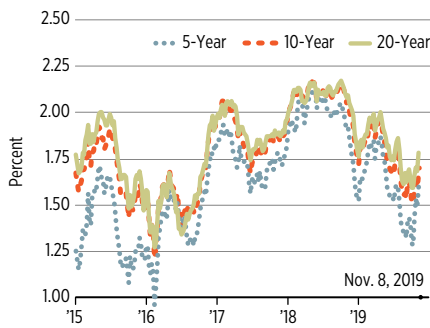
All data as of Nov. 14.

Real GDP Growth



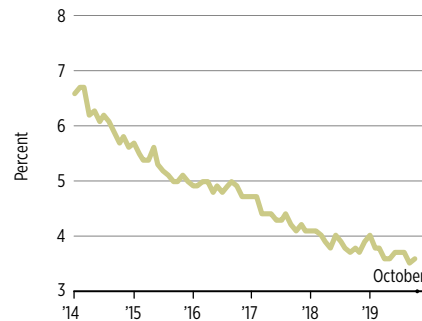
NOTE: Each bar is a one-quarter growth rate (annualized); the red line is the 10-year growth rate.

Inflation-Indexed Treasury Yield Spreads

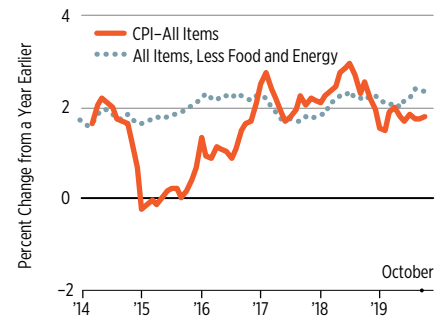


NOTE: Weekly data.

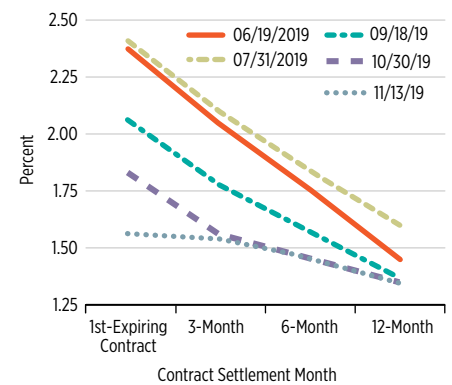
Civilian Unemployment Rate



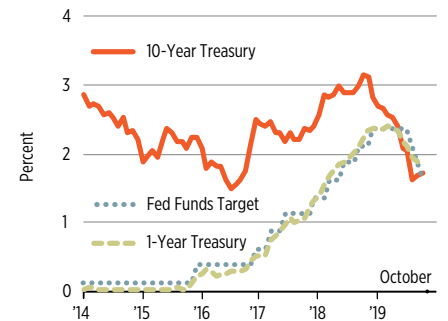
Consumer Price Index (CPI)



Rates on Federal Funds Futures on Selected Dates

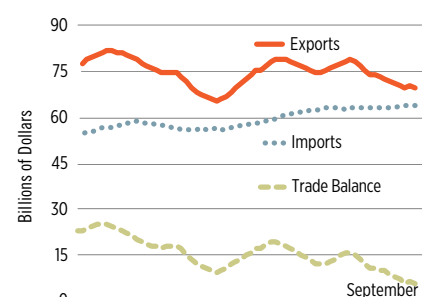


Interest Rates



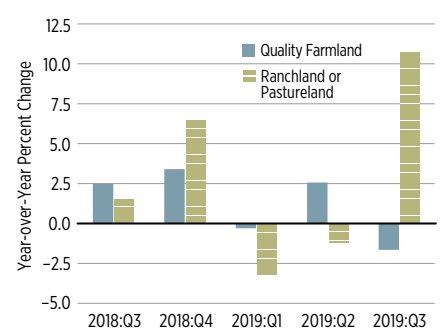
NOTE: On Dec. 16, 2015, the FOMC set a target range for the federal funds rate of 0.25% to 0.5%. The observations plotted since then are the midpoint of the range.

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

Green Cards

(continued from Page 15)

Conclusion

Our analysis reveals that while a large fraction of green cards have been given to family members of both U.S. citizens and green card holders, a substantial number have also gone to employment-based categories. As demand grows for skills that give the U.S. a competitive edge in the global economy, this program may be further leveraged to attract talented and skilled foreign workers and students. On the other hand, this might moderate the wage increases that would go to the native population in the absence of such immigration.

Immigration and trade both raise income distribution issues, which pose difficult choices to policymakers. Unlike trade, immigration involves international movement of people with potentially different languages and cultural backgrounds. This presents both social concerns and opportunities for the host nation. That discussion, although important, is beyond the scope of this article.

Finally, our analysis shows that green card holders, on average, are younger than the national population, with a substantial number being students or children. This bodes well for the future, when an aging U.S. population can be supported by younger and skilled entrants into its labor force. **RE**

(This article was published online Dec. 23.)

ENDNOTES

¹ We will use the terms “green card holder” and “permanent resident” interchangeably in the article.

² For details, see www.dhs.gov/sites/default/files/publications/Lawful_Permanent_Residents_2017.pdf.

³ Tables and charts related to this section are available from the authors on request.

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