

TEN

Summer 2018

FEDERAL RESERVE BANK OF KANSAS CITY

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Satellites and economic forecasting

Economic effects of legalized marijuana

Book explores roots of U.S. banking

PRIME AGES

MEN 25-54 INCREASINGLY LEAVING THE LABOR FORCE

PHOTO BY BOB GREENSPAN



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PRIME AGES

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Monetary Policy and Reform in Practice

(Note: Esther L. George delivered these remarks May 4, 2018, at the Hoover Institution Monetary Policy Conference at Stanford University.)

Thank you for the opportunity to offer my views on monetary policy and reform in practice. I appreciate the Hoover Institution bringing together leading academics and monetary policy makers to share ideas about the practical issues facing central banks today. We have much to learn from each other.

My comments focus on some of the practical issues I think about as I formulate my own policy views. As I do so, you'll hear me describe these issues with more questions than answers, reflecting the nature of the policy landscape today.

I want to note that these are my own views and are not necessarily representative of others in the Federal Reserve System.

Today's policy landscape

Nine years after the financial crisis, the Fed has, at least for the moment, achieved its objectives of maximum employment and price stability. Yet the legacy of the crisis—through the response of the Fed and fiscal authorities—has left us in a very different place than before the crisis in a number of ways. The equilibrium nominal policy rate is low by historical standards. The current target for the federal funds rate is considerably lower than the Federal Open Market Committee's (FOMC) projection of its longer-run value. Our balance sheet is almost five times its pre-crisis size. The Fed's footprint in financial markets is considerably

larger than before the crisis. The banking sector is consolidating, and big banks have gotten even bigger. Federal deficits and debt are high and projected to rise to unprecedented levels.

Despite this legacy, many of the structural developments that dominate our thinking today were well underway before the onset of the financial crisis and Great Recession. An aging population, slowing productivity growth, rising globalization and declining equilibrium interest rates all pre-date the crisis. In this sense, things have not changed. Moreover, since the mid-1990s and through the financial crisis, Great Recession, and current expansion, core inflation—as measured by the personal consumption expenditure price index—has fluctuated in a relatively narrow range of roughly 1 percent to 2½ percent.

Given the structural changes that have been developing over the last several decades, it may well be that we are in a low-growth, low-interest-rate environment. Yet, from a cyclical perspective, the economy appears to be operating at or beyond full employment with inflation expected to rise over the medium term, while the FOMC's funds rate target of 1½ percent to 1¾ percent remains well below the FOMC's projection of its longer-run level of about 3 percent. The current gradual normalization of interest rates is geared toward removing accommodation at a pace that is



expected to sustain the expansion without generating undesired increases in inflation on the one hand, or creating financial instability on the other. But there are clearly risks.

And there are still uncertainties about how the landscape will look once policy has achieved a “new normal.” In particular, questions remain to be answered about the Fed’s future operating framework, its strategic framework and its role in promoting financial stability. I’ll discuss each of these issues in turn.

Determining a long-run operating framework

In 2016, the FOMC held lengthy discussions about potential long-run frameworks for monetary policy implementation. The Committee discussed the merits of maintaining an abundance of reserves in the banking system versus returning to a framework of reserve scarcity. With an abundance of reserves, the Fed would rely on interest on reserves and the overnight reverse repurchase agreement (ON RRP) to maintain control over short-term market rates. With a scarcity of reserves, the open market desk at the New York Fed would control market rates through its control over the supply of reserves. The discussion ended with agreement that “decisions regarding the long-run implementation framework were not necessary at this time.” Since that time, however, we have begun to normalize our balance sheet with an understanding that the balance sheet will be smaller than it is today, but larger than it was in 2007. As the balance sheet continues its steady decline, I would suggest that we again need to consider the appropriate long-run size of the balance sheet and our related operating framework.

“As the balance sheet continues its steady decline, I would suggest that we again need to consider the appropriate long-run size of the balance sheet and our related operating framework.”

While it may simply be a case of nostalgia on my part, I found our minimalist pre-crisis operating framework to have a number of features that served us well for many years. We maintained a small balance sheet with liabilities that were comprised almost entirely of currency in circulation with reserves averaging about \$10 billion, compared with more than \$2 trillion today. We maintained a Treasuries-only balance sheet with duration-matching Treasury issuance to maintain a neutral influence on financial markets. We had a small number of counterparties, and we managed the supply of reserves to achieve the target federal funds rate. As a result, our footprint in the financial markets was relatively small.

Relative to this pre-crisis framework, the current operating framework—made necessary by a large balance sheet—has had a number of undesirable consequences, some of which were unintended. The Fed now owns significant outstanding shares of Treasuries and mortgage-backed securities (MBS) and is no

longer a neutral influence on financial markets. We have a large number of counterparties, including nonbanks, made necessary by the ON RRP facility. Increases in the funds rate are achieved by raising an administered rate—the interest rate on excess reserves (IOER). Some have expressed concern that as IOER goes up, payments to banks—including to foreign banks—go up. Finally, the nature of unconventional policies has drawn both attention and criticism to the Federal Reserve’s large balance sheet with consequences for central bank independence and fiscal discipline. Congress has begun to see the Federal Reserve as a source for plugging spending gaps, drawing on the Fed to fund the Consumer Financial Protection Bureau, finance highway spending, and more recently, to contribute \$2.5 billion to the federal government from its capital surplus as part of the budget deal passed in February after the brief government shutdown.

Given these developments, the current thrust of policy can become more difficult to gauge. At the same time the funds rate is being normalized, we have embarked on a program to gradually reduce the Fed’s security holdings by decreasing reinvestment of principal payments. While I support this policy—with balance sheet normalization occurring largely on autopilot and in the background—it does pose challenges as we try to understand the implications for the stance of policy. Is policy tighter than we think because the balance sheet is shrinking? Or is the still-large balance sheet putting downward pressure on longer-term rates making policy more accommodative than we think?

Whether it is desirable or even possible to return to our pre-crisis operating framework remains an open question for the FOMC. Can

we return to the corridorlike framework with scarce reserves, or will we need to retain the current floor system? If we maintain the current system, by how much can we reduce the supply of reserves? And what is the eventual role of the ON RRP facility? Can IOER guide the funds rate without reliance on the floor established by the rate on ON RRPs? Answers to these questions will be shaped by the FOMC’s future discussions.

Strategic framework

In addition to uncertainties about the longer-run operating framework, a number of strategic challenges and uncertainties pose practical issues for policymakers. With little countercyclical policy space available to respond to a future downturn, monetary policy options must contemplate how interest rate and balance sheet policies will work before, during



PHOTO BY MARTINO MINGIONE

President Esther George spoke at the Hoover Institution Monetary Policy Conference in May.

and after a crisis. Aggressively purchasing assets in a downturn and only gradually allowing them to roll off once the economy has fully recovered suggests the possibility of a balance sheet that grows bigger and bigger over time.

This dynamic, combined with varying degrees of uncertainty about the efficacy of asset purchases, has led to calls for a discussion about future policy strategies for the next encounter with the zero lower bound. Ideas like price-level targeting, a higher inflation objective or nominal GDP targeting all offer worthwhile and intellectually stimulating debate. And certainly the time is right to consider the trade-offs around various strategies, but determining if these ideas might work in practice is challenging.

Promoting financial stability

These uncertainties make it all the more important to ensure the current economic expansion is sustained as interest rates rise and the balance sheet normalizes. We should take every measure possible to prevent a crisis rather than hope that we can devise a monetary policy cure after the fact.

As the FOMC gradually moves away from the zero lower bound, with a slowly shrinking but still-large balance sheet and growing federal debt, maintaining financial stability is paramount.

Here I would like to make two key points.

- First, in contemplating a future bout of financial instability, we should be realistic about the robustness of macroprudential tools with a good dose of humility around the necessary finesse to deploy them in a timely fashion.

- Second, we should not waver in our aims to bolster resilience in our banking system especially for the largest banks.

There is little dispute that financial stability is a necessary condition for achieving the FOMC's employment and price stability mandates. It is recognized in the FOMC's "Statement of Longer-Run Goals and Strategies" as well as being the objective of macroprudential policies. However, there remains a tension as to the trade-off between macroeconomic goals and financial stability. The "lean or clean" debate is ongoing. Specifically, some argue that the output losses associated with using monetary policy to lean against growing financial imbalances far outweigh the possible benefits. Instead, they suggest that macroprudential policies are the appropriate response to financial instability. In my view, this approach might be more effective in theory than in practice.

A few years ago, I participated with some of my colleagues in a tabletop exercise designed to assess the efficacy of certain macroprudential policy tools in responding to a hypothetical financial crisis. In the exercise, we examined the use of capital-based, liquidity-based, and credit-based tools, along with stress testing and supervisory guidance in mitigating the effects of an overheating of the financial markets. What we discovered in conducting the exercise was that the effectiveness of the tools varied because of realities like implementation lags and/or limited scope. In addition, monetary policy looked to be a relatively more attractive option than some might have expected before the exercise. Obviously this particular exercise is not conclusive in all scenarios, but rather a caution about becoming overly confident in relying on macroprudential tools to address growing financial imbalances.

In thinking about the role of financial stability in the conduct of monetary policy,



The Federal Open Market Committee meets in Washington, D.C., eight times a year.

I find recent research from the Bank for International Settlements to be compelling. This research sees financial market deregulation from the 1980s and 1990s as having increased the likelihood of crises and posits a growing financial cycle in which monetary policy responds asymmetrically over time to crises, easing rates aggressively during the crisis but raising rates only gradually after the crisis has subsided. Their prescription is for policymakers to break this cycle by making policy more attentive to financial imbalances and more symmetrical in the response.

We should take advantage of the current economic conditions to bolster resilience in the financial system. Instead, the United States has yet to implement a countercyclical buffer and the banking agencies contemplate steps in

the direction of relaxing capital requirements. Recently issued for comment is a proposal to modify the enhanced supplementary leverage ratio on global systemically important banks (GSIBs) that would have the effect of lowering capital requirements. With the U.S. economy in a sustained expansion and at risk of growing financial imbalances, this is a time in the credit cycle when GSIBs and other banking organizations should be building capital instead of increasing leverage.

Conclusion

The financial crisis and Great Recession left a legacy of low interest rates, a big balance sheet and large fiscal deficits. And a number of long-running structural trends have become prominent considerations for understanding their implications for future growth. This landscape is accompanied by an economy growing at or above trend with full employment, stable prices and easy settings for monetary policy. Whatever the “new normal” is, monetary policy is not yet there. When times are good, as they are now, it is an opportune time to resolve some of the uncertainties around how we will implement monetary policy in the future, what strategies we will employ in response to the next downturn, and how can we best promote resilience and stability in our financial system. I hope we do so before we find ourselves cleaning up after the next crisis.

A handwritten signature in cursive script that reads "Esther L. George".

ESTHER L. GEORGE, PRESIDENT
FEDERAL RESERVE BANK OF KANSAS CITY



PHOTO BY BOB GREENSPAN

PRIME AGES

Stark decline in labor force participation for men 25-54

Sixteen years after graduating from high school, Mark Taylor in December will complete a degree in computer science at Park University.

To attend classes, he's driven 55 miles from his home in Valley Falls, Kan., to the campus in Parkville, Mo., with his golden retriever, Hutch, at his side.

Taylor, 33, hopes to use what he has learned about Web design and development to earn a living—eventually.

Right now, Taylor is neither working nor looking for a job. He is among some 7 million men nationwide between ages 25 and 54 who are not in the labor force.

Taylor is a full-time student and a single parent. The U.S. Marine Corps veteran also has a diagnosis of post-traumatic stress disorder (PTSD) and relies on Hutch, a service dog, to calm and comfort him.

"He can sense my anxiety and flashbacks," Taylor said of Hutch. Taylor was diagnosed shortly after being discharged from the Marines in 2006.

Having a disability, being in school and caring for family responsibilities are three of the situations most often cited by men in this

age group who are not working. Retirement is the other.

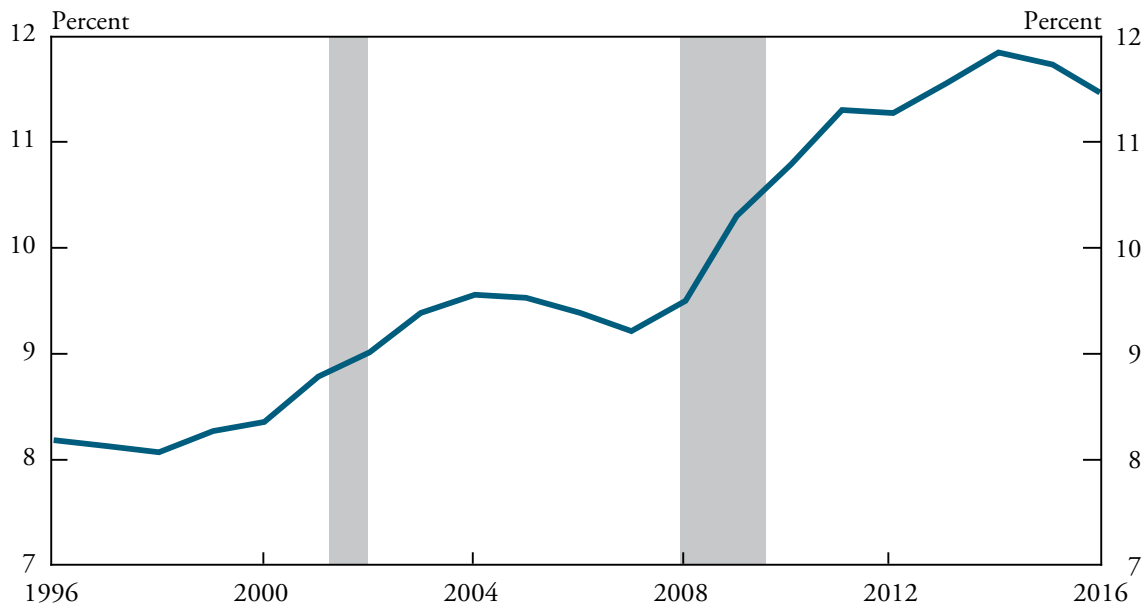
Overall participation in the labor force declined from 1996 to 2016. Yet, "the increase in nonparticipation was especially stark for prime-age men," said Didem Tüzemen, a senior economist at the Federal Reserve Bank of Kansas City.

Tüzemen earlier this year published research showing that prime-age men—defined as those from ages 25 to 54 who are not working or looking for work—increased from 4.6 million in 1996 to 7.1 million in 2016.

Tüzemen studied two decades of statistics from the monthly surveys of about 60,000 households nationwide conducted by the U.S. Census Bureau.

Those responding to the surveys are asked whether they are employed, unemployed or not in the labor force. If the respondents are not in the labor force, they are asked "What best describes your situation at this time?" Nearly half of the men in the survey who are not in the labor force cite a disability or illness as the description of their situation.

Nonparticipation rate of prime-age men



Notes: Gray bars denote National Bureau of Economic Research (NBER)-defined recessions at a monthly frequency. Nonparticipation rates correspond to monthly observations averaged for each year.

Sources: Current Population Survey, NBER and researcher's calculations.

Taylor's situation makes employment challenging. He has to consider child care for an 8-year-old son, a work environment suitable for the constant companionship of his service dog, and bouts of post-traumatic stress disorder.

He is handling child care by taking classes online at home and on campus when his son is in school. Family members nearby help as well.

Taylor receives disability compensation and is participating in a Veterans Affairs treatment program for PTSD. The disability income is not enough to live on, he said, and he wants to find a job eventually. He

is pursuing the degree in computer science because information technology skills often can be applied remotely. Taylor would like to be able to develop and design websites from home, where he feels safer and more relaxed.

His desire to work makes him an exception to the research: most of the men from 25 to 54 who are not in the labor force don't want to return.

In analyzing the statistics, Tüzemen found that "since 2011, the share of nonparticipating prime-age men who want a job has steadily declined, reaching 14.8 percent in 2016."

Why aren't they working?

The skills gap

In Tulsa, a billboard announces: “We need welders.” Elsewhere, “Help Wanted” signs are hanging on doors of convenience stores and posted on job boards across the country.

“There is a huge divide between people who have the right skills employers are looking for versus everyone else,” said Shelley Cadamy with Workforce Tulsa, which oversees labor force development planning and coordinates with employers, workers and community partners.

Job openings may be abundant, but candidates with the right skill sets who are available and willing to work aren’t.

“If I had 200 truck drivers show up in my office right now, I’d still have a shortage,” Cadamy said.

About a year ago, a large company in the Tulsa area needed 200 people with accounting skills ranging from bookkeeper to Certified Public Accountant, Cadamy recalled. She had no qualified applicants to offer them.

In Denver, unemployment is at a low 3 percent, and job demand is high.

“Most of our work sites need workers,” said Josh Downey, president of the Denver Area Labor Federation. “Denver is experiencing a shortage of 15,000 to 20,000 workers in construction alone.”

In Oklahoma, “we hear very loudly from manufacturers that they cannot get the workers they need,” said Erin E. Risley-Baird, executive director of the Oklahoma Office of Workforce Development.

Across Oklahoma, 100 occupations have been identified as critical for the state’s continued growth and economic prosperity.

The critical occupations range from physicians and surgeons to plumbers, pipefitters and steamfitters to emergency medical technicians and paramedics.

“Even if we filled all those occupations, that’s only 25 percent of all jobs in the state,” Risley-Baird said.

And the gap remains between skills that

individuals have now and the skills employers need.

“We are working with employers to find out what competencies they are asking for and we’re talking with education and training providers to bring the two together,” she said.

In Kansas City, where the unemployment rate is about 4 percent, Clyde McQueen, chief executive officer of the Full Employment Council, said he is often asked by employers if he has any information technology workers.

“I’ve got plenty of IT workers—those who didn’t upgrade their skills,” McQueen said.

It’s all about the skills, employment experts say. The right skills. The skills that jobs currently require—not necessarily the skills that workers brought with them when they were hired two decades or even two years ago.

The ‘job polarization’ factor

Tüzemen examined two decades of employment based on skill levels. What she found was increasing demand for workers from 1996 to 2016 for high-skill and for low-skill occupations and decreasing demand for middle-skill occupations.

In response to advancements in technology, Tüzemen said, “labor demand and the skill composition of jobs have changed dramatically.”

In 1996, nearly 54 percent of all jobs were middle-skill occupations; 31 percent were high-skill occupations; and 14 percent were low-skill occupations.



Mark and Alexander Taylor at a computer in their home.

Those shares shifted. In 2016, the employment share of middle-skill occupations dropped to 43 percent while the employment share of high-skill occupations rose to 38 percent and low skill to 18 percent.

Tüzemen then studied the change in skill levels with the prime-age men in the labor force and found that “the decline in middle-skill jobs disproportionately affected prime-age men.”

The share of prime-age men in high-skill jobs, such as managerial and professional occupations, increased 4.5 percentage points, and those in low-skill jobs, such as food service and security jobs, increased 4 percentage points. The share of prime-age men in middle-skill jobs, however, decreased by 8.5 percentage points.

“The largest employment losses for prime-age men were in production occupations, reflecting the decline in manufacturing employment,” Tüzemen said.

Workers gravitated toward jobs at the upper and the lower ends of the skills spectrum as jobs in the middle-skill level disappeared—a trend called job polarization.

Tüzemen calculates that the shrinking of the middle-skill occupations—job polarization—led to the loss of 1.9 million jobs for prime-age men in 2016.

“A decline in the demand for middle-skill workers accounts for most of the decline in participation among prime-age men,” Tüzemen said.

Computers, artificial intelligence and robots have all changed middle-skill jobs.

Much assembly-line work has become automated as have other routine jobs in sales, office and administrative services and in the typically male-dominated fields of construction, installation, maintenance and transportation.

“Technology has impacted jobs requiring middle skills,” said Brad Kleindl, professor of marketing and dean of the College of Management at Park University. “Manufacturing today is so highly automated

that it takes a higher level of skill to run a machine.”

It’s not just factory jobs.

“Coding is now being done by computers,” Kleindl said. “Coal mining, too, has become a very automated process. Individuals no longer have to go down into a shaft—now they take the top of the mountain off.”

Jobs still exist in manufacturing and mining but the skill level has changed.

The World Coal Association describes modern miners as “highly skilled and well-trained in the use of complex, state-of-the-art equipment.”

Besides skills, other barriers stop some prime-age men who want a job from entering the workforce.

Just the fear of automation, for example, can be an obstacle to entering or re-entering the workforce.

“Technology came upon us rather quickly,” said Downey of the Denver Area Labor Federation..

The need for truck drivers in the Denver area is significant, but “skeptical males 25 to 54 with commercial driver’s licenses are sitting out because they see automation coming and eradicating jobs now held by 60,000 to 90,000 drivers of buses, taxicabs, delivery trucks, service vans and other commercial vehicles,” he said.

The specter of the self-service economy looms large.

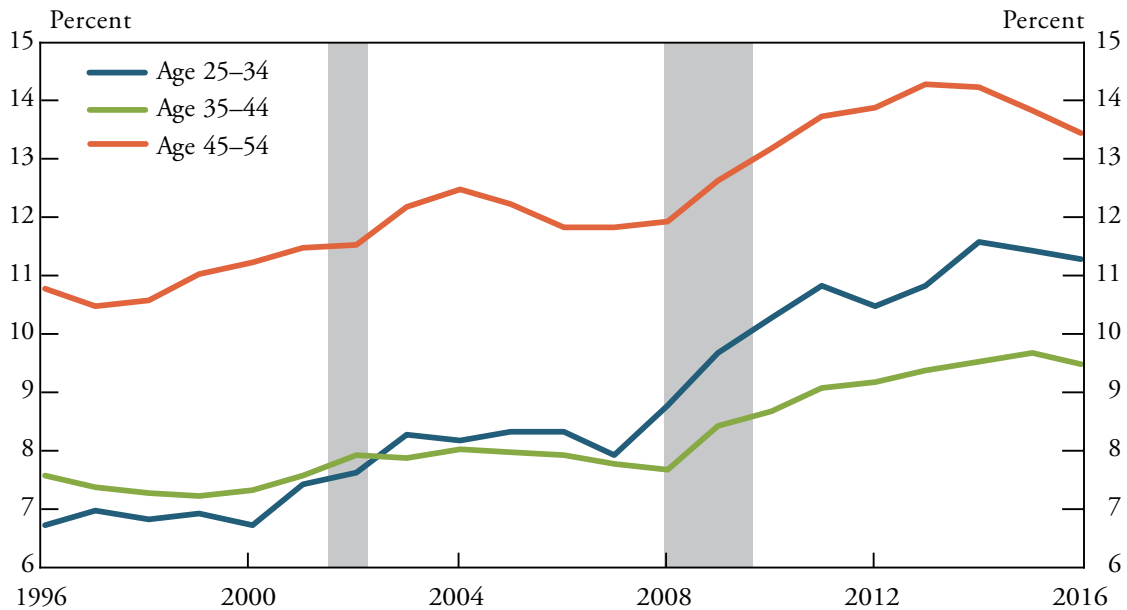
These men see what has happened with grocery stores and fear their jobs will go away, too, Downey said. Some stores now employ fewer cashiers and baggers because shoppers can do it all themselves—scan the price, bag the groceries, swipe the card, load the cart and leave.

The decision to exit

Automation played a role in Ted McKinzie’s decision to retire in 2015 at the age of 50.

McKinzie, who holds bachelor degrees in residential architecture and civil engineering,

Nonparticipation rates of prime-age men by age group



Notes: Gray bars denote recessions at a monthly frequency as defined by the National Bureau of Economic Research (NBER). Nonparticipation rates correspond to monthly observations averaged for each year. Sources: Current Population Survey, NBER and researcher's calculations.

worked as a property improvement inspector for a national hotel chain for 10 years.

The work allowed him to apply his skills and expertise in reviewing construction, design, quality control and relicensing compliance of hotels in a five- to six-state territory.

“But they were starting to use a digital system—all you did was check boxes,” he said. “Anyone with a high school diploma and computer skills could do the job.”

That change was underway when the last straw—an email—finalized McKinzie’s decision to leave the labor force.

He remembers opening the message on Memorial Day weekend of 2015. The company was notifying him about how he was to spend his \$50 per diem allowance for meals.

McKinzie read the email and then gave 30 days’ notice.

“Everything was being micromanaged,” McKinzie recalled.

His work required that he travel four days a week all month long inspecting hotels.

“I was tired of being on the road every week,” McKinzie said. “I was looking for a way out of corporate America.”

Rental property gave him that way out.

McKinzie started buying, remodeling and renting or selling houses and apartment buildings in 2001. He made a mental note then that the investment income would be a good way to replace earnings if necessary.

He now owns 17 single-family houses and a duplex in the Kansas City area. He lives on an

80-acre farm in Lawson, Mo., where he raises chicken and ducks, grows a lot of his own food and is able to pursue a simpler lifestyle with more self-sufficiency.

Leaving the labor force allowed him to care for his 89-year-old mother in Sedalia, Mo., before she died in March 2017.

“Six months after I quit my job, she was diagnosed with cancer,” he recalled. “I was able to spend a huge amount of time with her—taking her to doctor’s appointments, helping her with the garden.”

McKinzie’s work history includes jobs at the Missouri Department of Transportation, a Chicago architecture-engineering firm and a Kansas City engineering firm.

Would he consider returning to the labor force?

“Absolutely not,” he said.

Clearly, McKinzie is retired and he intends to stay that way. But what’s stopping the millions of other prime-age men who aren’t retired, aren’t working and aren’t looking for work?

Older men, especially those who have held the same job for years and are on the verge of retirement, may not be willing to learn new skills. When a factory closes or a job goes away, they may decide to sit tight.

At the Harley-Davidson plant in Kansas City, Mo., 800 workers are deciding what they will do when the plant leaves town in 2019.

The plant will shift its operations to York, Pa., and some of the Kansas City workers may be hired to work there.

“Those who are 50 to 54 are considering whether they want to enter the workforce at this stage of life,” said Kevin Amos, president of the International Association of Machinists Local 176.

If their children are grown, the older Harley-Davidson machinists may choose to rely on the income and health insurance benefits of a working spouse rather than look for another job, Amos said.

In Oklahoma, when oil and gas production declined a few years ago, the Oklahoma Office of Workforce Development offered a training

Getting more prime-age men into the labor force may require equipping workers with the new skills employers are demanding in the face of rapid technological advancements.

program for petroleum engineers to acquire the skills necessary to work as aerospace or mechanical engineers.

“Very few participated,” Risley-Baird recalled. “There was a reluctance to retrain.”

Sometimes the barriers are as basic as a high school diploma and a driver’s license.

“We are working with nonprofits and the City of Denver to help provide driver’s education and free or low-cost GED courses and with union affiliates to help men get the credential they need for positions in building and construction trades,” Downey said.

So many jobs. So few applicants. What’s a company to do?

The outlook

“We’ve seen a workforce crisis coming for at least 20 years,” Cadamy said. “What should have been happening is apprenticeships and on-the-job training.”

When the Tulsa company couldn’t find the 200 bookkeepers and accountants it wanted, it turned to a community college. Together, the company and the college created two new programs and tweaked an existing one to train

workers to fill their positions.

Getting more prime-age men into the labor force “may require equipping workers with the new skills employers are demanding in the face of rapid technological advancements,” Tüzemen said.

The schooling needed in today’s work world often requires only weeks of training to get the right credential or to upgrade existing skills.

Rather than semester-based education, workers now are participating in shorter programs for jobs that require as little as nine or 12 weeks of training and a credential, McQueen said.

“Seventy-five percent of all jobs in our region don’t require a four-year degree,” he said.

McQueen has been with the Kansas City Full Employment Council, a regional workforce system of job training and employment programs, since 1987. He has seen a huge change in the workforce during that time.

Thirty years ago, 65 percent of the job-seekers turning to the council for help were women.

“I noticed a transformation around 2008-2009,” McQueen said. “The number of men increased to about 60 percent of the job applicants.”

With a high school diploma and assembly-line specific skills, men who have lost jobs to automation may need to upgrade their skills.

Yet, school requires an investment of money and time. Sometimes the men who need jobs are supporting families and can’t afford to be without a paycheck.

The men are under strong economic pressure to get a job immediately: “They want to go to school and earn a living at the same time,” McQueen said.

Apprenticeships, involving both classroom instruction and work site training, may be the answer.

Metropolitan Community College-Business & Technology in Kansas City

works with regional employers to develop apprenticeship programs to meet the needs of their industry.

“Training may range from eight weeks to two years,” said Jacqueline Gill, president of the Business & Technology center. “And when you finish, employers are waiting to hire you.”

The college has identified more than 30 in-demand occupations and one of those is web developer.

So, when Mark Taylor is ready to return to work, there’s most likely a place for his website design and development skills.

Although his road to re-entry has had some detours, Taylor is on his way back to the labor force.

Before enrolling at Park University, he earned an associate’s degree at Kansas City Kansas Community College in 2016—after dropping out for a few years.

About that time, Hutch came along to help Taylor with his PTSD: “He can pick up on chemical changes in my brain that I’m not aware are happening.”

Taylor helps other veterans as well. He is a member of Team Fidelis, a Kansas City-area organization, and is a veteran specialist.

“Once members join, they are assigned to a veteran specialist,” he said.

Taylor said he is there “when new members need someone to talk to, and helping out other veterans helps me, too.”

T

SU BACON, CONTRIBUTING WRITER

FURTHER RESOURCES

The full publication of Senior Economist Didem Tüzemen’s research on prime-age men is available at <https://www.kansascityfed.org/publications/research/er>

COMMENTS/QUESTIONS are welcome and should be sent to teneditors@kc.frb.org.



SPACE-AGE FORECASTING

How Nighttime Satellite Pictures Are Helping Experts Project U.S. Export Growth

For decades government-issued reports and other traditional forms of data, such as gross domestic product (GDP), have been used to shape forecasts of countries' export growth. These forecasts depend largely on estimating foreign demand and income.

This common approach has at least two glaring limitations:

- **Timeliness.** In many cases, traditionally issued GDP reports reflect conditions that were in place one to two quarters earlier because of data availability. In other words, it's not real-time information.
- **Reliability.** Studies show that the quality, depth and accuracy of reports on growth in foreign GDP—a key element in forecasting demand—can vary, especially in developing countries. As a result, experts evaluating this data might not be getting accurate pictures of what is happening on the ground.

So, what if there were a way to get truly accurate, real-time snapshots? The answer might have been found—quite literally—in outer space.

Jun Nie, a senior economist at the Federal Reserve Bank of Kansas City, and research associate Amy Oksol this year published a study asserting that nighttime satellite pictures of lights on the ground can be reliably used in forecasting U.S. export growth. They studied monthly satellite pictures of several countries' nighttime lights. They found greater accuracy in the data derived from those images when compared with export growth forecasts based on traditional methods—specifically GDP analysis and a “random walk.”

“Nighttime lights as viewed from satellites make up a unique dataset that provides information on nearly every place on earth,” Nie and Oksol explain in their research paper. “Satellite cameras take pictures of the entire planet at night (so lights can be better seen) and filter the images for various anomalies such as clouds and fires.”

Because of significant advances in satellite technology over the years, these images have a high level of detail. That level of detail makes it possible to assign a luminosity value ranging from zero to 63—with zero being unlit and 63 being maximum light. By using special mapping software, Nie and Oksol

Quarterly Forecast Comparison*

Model specification	All	Advanced	Developing
GDP	1.31	0.95	0.98
Lights	1.39	1.25	0.75
Random walk	1.00	1.00	1.00

*Note: The numbers in this chart reflect the root-mean-square-error (RMSE), a common forecasting metric showing the deviation of the forecast from the actual value. In the Kansas City Fed's test, the lower the RMSE number, the more accurate the method was in forecasting quarterly gross domestic product for developing economies. The nighttime lights method (highlighted in the chart above) beat the traditional GDP forecasting method and was more accurate than a random walk through the areas used in the test.

Sources: Available at www.kansascityfed.org/publications/research/er

were able to use luminosity values to create a numerical lights index for a particular region. The software could then calculate the amount of nighttime light in that region in a given period. These luminosity values also could be aggregated across cities, regions, countries or other geographic areas for a particular point in time.

To test the accuracy of the night-lights approach, Nie and Oksol created a lights index for major U.S. trading partners and compared forecasts using the lights information with traditional quarterly forecasts of GDP growth and the “random walk” approach. To gauge accuracy of each method, Nie and Oksol compared the root-mean-square error (RMSE), a common forecasting metric of the average deviation of the forecast from the actual value.

The conclusions:

- Monthly lights data generated significantly fewer forecasting errors than the quarterly GDP model.
- With satellite pictures now available on a daily basis, future forecasting models could

“Nighttime lights as viewed from satellites make up a unique dataset that provides information on nearly every place on earth.”

be improved by exploiting this higher frequency and truly real-time availability.

Although Nie believes the Kansas City Fed study, which focused on monthly images, is perhaps the first deep analysis of its kind, he points out that the concept of connecting nighttime lights with economic activity is not entirely new. Various studies dating to the 1990s—when only annual satellite images were available—have shown that pictures of night lights can be helpful in measuring a country's GDP. This is because the amount of light in a particular area correlates to the area's income levels.

Overall Forecast Comparison (RMSE)*

Model specification	All	Advanced	Developing
Random walk: quarterly	2.20	3.23	4.13
GDP: quarterly	2.89	3.06	4.06
Lights: quarterly	3.06	4.05	3.11
Random walk: monthly	2.28	2.14	3.27
Lights: monthly	1.33	1.28	2.00

Note: The RMSE for the monthly light model (highlighted in the chart above) is the average of the RMSEs in the late and early forecasts.

Sources: Available at www.kansascityfed.org/publications/research/er

“Overall this dataset is pretty new ... and that’s exciting. There are a lot of things to explore in the future.” — Jun Nie, Senior Economist

The Earth Observation Group at the National Oceanic and Atmospheric Administration (NOAA) began making monthly satellite images available in 2012, and these pictures are what Nie and Oksol examined in their study. Daily images became available in 2017. Although further analysis will be necessary, this daily availability is “truly

real-time” and “opens up some new opportunities” in forecasting, Nie said.

“Overall this dataset is pretty new...and that’s exciting,” Nie said. “There are a lot of things to explore in the future.”

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STAN AUSTIN, EDITOR, TEN MAGAZINE

FURTHER RESOURCES

The research by Jun Nie and Amy Oksol is available at <https://www.kansascityfed.org/publications/research/er>.

COMMENTS/QUESTIONS are welcome and should be sent to teneditors@kc.frb.org.

Ask an Economist ...

Assessing the economic effects of Colorado's marijuana industry



Alison Felix

In 2012, Colorado voters passed Amendment 64, making the state one of the first to legalize recreational marijuana. Marijuana for medical purposes was already legal in the state. Today, medical marijuana is legal in 29 states, and recreational marijuana is legal in nine states. Both are legal in Washington, D.C. Kansas City Fed Vice President, Denver Branch Executive and Economist Alison

Felix, along with Associate Economist Sam Chapman, explored the economic effects of Colorado's marijuana industry. Their findings were published earlier this year.

How much money is being generated by the marijuana industry?

Recreational marijuana stores began operating in Colorado on Jan. 1, 2014. In the first month, recreational sales exceeded \$14 million and medical sales were \$32.5 million. Since then, recreational sales have grown sharply while medical sales have remained roughly flat. In 2014, total annual recreational sales were \$303 million, while medical sales totaled \$380 million. By 2017, recreational sales had grown to almost \$1.1 billion and medical sales were almost \$417 million.

For perspective, personal consumption expenditures on all goods and services totaled \$236.3 billion in Colorado in 2016. Total marijuana sales that year were \$1.3 billion, or 0.55 percent of all personal consumer expenditures. Meanwhile, the state of Colorado collected more than \$247 million in taxes and fees from the marijuana industry in 2017, equating to about 2.3 percent of the state's general fund revenue for that year.

How has legalized marijuana affected employment?

There is no official count of everyone working in the marijuana industry, but the state provides data on those licensed to work in the sector. All employees working in the industry in Colorado must hold an occupational license issued by the Colorado Marijuana Enforcement Division. As of March 2018, there were more than 38,000 issued individual licenses, including 1,637 business owners. However, not everyone with a license is working in the industry. The Marijuana Policy Group estimates that one active license equates to 0.467 full-time equivalent positions. Using this estimate, the industry employs about 17,800 full-time equivalent workers. As of February 2018, employment in the industry made up 0.7 percent of total Colorado employment, using the formula equating each active license to 0.467 full-time jobs.

What are the costs and challenges?

Because of limited data, the full costs of the marijuana industry in such areas as public safety and health are uncertain. In addition, Colorado's legalization of marijuana conflicts with federal law, which has created other challenges, including access to payment and banking systems; legal risks for business owners and consumers; and the diversion of marijuana purchased in Colorado to states where marijuana remains illegal.

Get more information about this subject and read speeches and articles by Alison Felix at www.kansascityfed.org/en/publications/research/rme/archive/rme-4-16-18.

MAKING A CONNECTION

IN FOUNDING THE FEDERAL RESERVE MORE THAN A CENTURY AGO, Congress recognized the importance of connecting the nation's central bank to the Main Streets of America. The Federal Reserve Bank of Kansas City carries out this role through its president and its programs and activities throughout the Tenth District, nation and welcoming countries. Here is a glimpse at the recent activities of President Esther L. George and the staff of the Kansas City Fed. Follow us on Twitter @KansasCityFed for more photos and information as events happen across the district.



On March 30, state banking association executives visited the Federal Reserve Bank of Kansas City headquarters. Front row (from left), Kansas City Fed Senior Vice President and Chief of Staff Diane Raley; Doug Wareham, Missouri Bankers Association; Kansas City Fed President Esther George; Mike Geesey, Wyoming Bankers Association and Max Cook, Missouri Bankers Association. Back row (from left), Don Childears, Colorado Bankers Association; Roger Beverage, Oklahoma Bankers Association; Chuck Stones, Kansas Bankers Association; Richard Baier, Nebraska Bankers Association; Craig Buford, Community Bankers Association of Oklahoma and Kansas City Fed Senior Vice President Kevin Moore.

The Kansas City Fed Board of Directors and President Esther George met in May with Karl Massey (third from left), an official with the United Kingdom Local Pension Partnership. During his Kansas City visit, Massey addressed the board and hosted topic discussions with bank staff from economic research, payments and bank supervision. He also participated in a roundtable with Kansas City area business and community leaders. Directors (from left): Doug Stussi, Brent Stewart, Lilly Marks, Board Chair Rose Washington and Steve Maestas.



KANSAS, MISSOURI & BEYOND



PHOTO BY MARTINO MINGIONE

At the Hoover Institution Monetary Policy Conference in May at Stanford University, President Esther George participated in a panel discussion with (from left) Robert Kaplan, president of the Federal Reserve Bank of Dallas; Raphael Bostic, president of the Federal Reserve Bank of Atlanta; and Charles Plosser, a visiting fellow at the Hoover Institution and former president of the Federal Reserve Bank of Philadelphia.



Commodity Futures Trading Commission Chairman J. Christopher Giancarlo met with President Esther George in April to discuss agriculture market conditions and the regional economy.



President Esther George visited with students at Longfellow Elementary School in Kansas City in April as part of the Teach Children to Save program. The program helps children understand the basics of personal finance through classroom visits and activities. In 2018, the program has reached more than 8,000 students across 125 schools in the Kansas City area.

KANSAS, MISSOURI & BEYOND



President Esther George joined visiting scholar Amanda Bayer (front row, fourth from left) and several women at the Federal Reserve Bank of Kansas City who work in the field of economics. Bayer, an economist from Swarthmore College, was in Kansas City in June for a seminar on the need for diversity in the economics profession.



During a March visit to Lincoln, Neb., President Esther George, members of the Kansas City Fed's Omaha Board of Directors, and Omaha Branch staff members toured the headquarters of Hudl, a company that provides video solutions for athletes, coaches and teams. Tour participants (from left): Director Eric Butler, Director Brian Esch, President George, Director Annette Hamilton, Omaha Branch Executive Nathan Kauffman, Director Kimberly Russel, Director Thomas Henning, bank Assistant Vice President Nicholas Hatz and bank Research Associate John McCoy.



President Esther George in June hosted Canadian Economic Minister Marvin Hildebrand, who is based at Canada's embassy in Washington, D.C.



Alfonso Navarro Bernachi (center), Mexico's head consul in Kansas City, visited the Kansas City Fed's headquarters in March and met with President Esther George and members of the bank's staff. Kansas City Fed staff (from left): Senior Economist José Mustre-del-Río, President George, Assistant Vice President and Economist Nicholas Sly and Assistant Vice President Erika Hamilton.



President George was the keynote speaker in April at a luncheon hosted by the Liberty (Missouri) Economic Development Corporation (LEDC) at William Jewell College. With President George (from left): Ralph Boots, LEDC executive director; Kansas City Fed Executive Vice President and William Jewell alumnus Dawn Morhaus; and Jacob Dice, president of the school's Economic Club. This summer Dice was an intern in the bank's Center for the Advancement of Data and Research in Economics.

Building relationships ...



Senior Analyst Pam Love and other Denver Branch employees participated in “Teach Children to Save Day” in April at Dora Moore Elementary School in Denver. Students from kindergarten through third grade took part in activities tied to financial literacy stories read by Kansas City Fed employees.



During the Denver Branch Board of Directors meeting in July in Casper, Wyo., President Esther George, directors and bank staff learned about workforce training options in the region, which included the experience of driving earth-moving equipment via simulators at the Wyoming Contractors Association Regional Training Center. At the controls (from left), President George; Director Edmond Johnson; bank Senior Vice President Diane Raley; Vice President, Denver Branch Executive and Economist Alison Felix; and Director Ashley Burt.



Students from Denver (left photo) and Albuquerque were honored for participating in the bank’s Student Board of Directors program. On hand to congratulate the students: Alison Felix, vice president, Denver branch executive and economist (far left, Denver photo); Erin Davis, program coordinator (far right, Denver photo) and Steve Maestas of the Kansas City Fed’s Board of Directors (far right, Albuquerque photo).

OKLAHOMA



In March, Chad Wilkerson, Oklahoma City branch executive, vice president and economist, spoke at an economic forum and business roundtable in Ardmore. The event was hosted by the Kansas City Fed and attended by business leaders from southern Oklahoma. As part of the event, Wilkerson toured local businesses to learn more about the economy.



The Oklahoma City Branch hosted annual regulatory update seminars in Oklahoma City and Tulsa for bankers. The seminars provide a forum for the Kansas City Fed to communicate current regulatory topics and perspectives – and hear from bankers about any challenges they are facing. Megan Williams, representing the Fed's Regional Affairs team, was among the seminar presenters.



In March, the Oklahoma City Branch hosted an “Evening at the Fed” professional development event for Oklahoma educators. Cecilia Robinson-Woods, superintendent of Millwood Public Schools in Oklahoma City and a member of the Kansas City Fed's Community Development Advisory Council, spoke about how her school system gets students ready for careers. Attendees also heard an economic presentation by Oklahoma City Branch Executive Chad Wilkerson.



Oklahoma City Branch employees volunteered in April with the Junior League of Oklahoma City to help with a project that is expanding and renovating the Jungle Gym playground area at the city's zoo. Employees worked on the project's hospitality committee, serving meals to volunteers, and helped assemble playground equipment.



Nathan Kauffman, vice president, Omaha Branch executive and economist, congratulated a student at the Nebraska Stock Market Game Banquet of Champions at the University of Nebraska in Lincoln. Kauffman provided the welcome address at the event, which is hosted by the Nebraska Council of Economic Education and recognizes the top elementary, middle school and high school Stock Market Game teams in the state.



The Omaha Branch Student Board of Directors completed the 2017-2018 program in May and was honored in a ceremony at the branch. Omaha program coordinator Nicole Connelly (far right) congratulated the students.



McCook, Neb., banker Brian Esch, a member of the Kansas City Fed's Omaha Board of Directors, spoke with members of the Omaha Branch Student Board of Directors during a networking lunch in April. Esch and other Omaha directors shared information on their roles as board members and discussed career paths and opportunities with the students. The Student Board wrapped up the 2017-2018 program in May.



In May, Senior Community Development Advisor Dell Gines shared an update on trends in rural economic development during a forum that the Omaha Branch hosted in Gering, Neb. Omaha Branch Executive Nathan Kauffman also provided an economic update as part of the program.

Omaha Branch hosts leadership delegation from Pakistan



Omaha Branch Executive Nathan Kauffman (standing, center) was joined at the Pakistan delegation meeting by bank Exams & Inspections Manager Marci Brett, Assistant Vice President Nick Hatz and Exams & Inspections Manager Todd Hirsch.

A group of government, finance and economic development professionals from Pakistan visited the Kansas City Fed's Omaha Branch in April as part of the State Department's International Visitor Leadership Program (IVLP).

The Pakistan delegation wanted to visit the Omaha Branch because of the group's interest in agricultural lending. This included learning about the Federal Reserve's role in supervising community banks that lend to small- and medium-sized enterprises related to agriculture. The visiting group included professionals in the financial industry and government officials

focused on economic and rural development. In addition to banking issues, topics of discussion included the regional economy and the structure of the Federal Reserve System.

The IVLP, launched after World War II, is one of the State Department's oldest and most successful programs. It selects current and emerging leaders from around the world and invites them to the United States for short-term visits focused on specific topics.

Learn more about the IVLP at eca.state.gov/ivlp.

Kansas City Fed honored for commitment to supplier diversity



PHOTO BY GARY BARBER

At the 2018 Midwest Supplier Diversity Exposition, a team representing the Kansas City Fed's supplier diversity strategy included (from left) Denise Simmons, Andres Rivera Hurtado, Diana Serrano, Tammy Edwards and Curt Haverland.

The Federal Reserve Bank of Kansas City was honored in May by the Metropolitan Community College of Kansas City (MCC) for its commitment to supplier diversity and received an award for "Turning Contacts into Contracts" during the MCC's Contract Awards Recognition event. The Kansas City Fed was nominated for the award by Superior Moving and Storage, a local woman-owned business. The award highlights organizations that value diversity in procurement.

Representatives from the Kansas City Fed learned of Superior Moving and Storage at a

supplier diversity exposition hosted by the MCC. Soon after, the bank enlisted the help of Superior Moving and Storage for a project. Completing a project with the Kansas City Fed meant so much to Ceil Lynch, the owner of Superior Moving and Storage, that she nominated the bank for the award

Learn more about the bank's commitment to diversity and inclusion at www.KansasCityFed.org/en/aboutus/kcfedinformation/diversity.

Kansas State coach Bill Snyder shares message of teamwork, perseverance

Bill Snyder, longtime Kansas State University football coach, visited the Kansas City Fed in May and spoke with employees about the importance of pursuing goals and working as a team. Snyder volunteered his time through ToastMasters International and its Kansas City Fed affiliate, FedMasters.

Rather than focus on sports, Snyder shared lessons on inspiration and leadership, stressing the importance of surrounding oneself with people who are supportive and encouraging. He cited personal examples, including teachers, an elementary school principal, early employers and—most importantly, he said—his mother, who inspired and encouraged him. His lessons on success stressed the importance of teamwork.

“When you work together, it has to be in a setting where people admire and appreciate each other and get along well,” he said. “People working at arm’s length probably don’t get as much done as they could.”

He encouraged employees to work hard, set goals and continue to strive.

“To me the most important thing is self-expectations,” he said. “What do we expect of ourselves? I see so many who have lower expectations of themselves than they should.”

Snyder’s talk with employees is one example of the Kansas City Fed’s focus on employee development and engagement.

Learn more about career opportunities at the Kansas City Fed at www.KansasCityFed.org/careers.



Kansas State football coach Bill Snyder with President Esther George, Senior IT Auditor Ryan Seematter of FedMasters and First Vice President Kelly Dubbert.

Hoenic returns to help mark 10th year at headquarters building



Former Kansas City Fed President Tom Hoenic (right) shared anecdotes and answered employees' questions during the 10-year commemoration. Bank historian Tim Todd was moderator.

In June, the Federal Reserve Bank of Kansas City observed the 10th anniversary of its head office relocation from downtown to 1 Memorial Drive.

At the commemoration ceremony, Kansas City Fed President Esther George was joined by former bank President Tom Hoenic, who led the organization through the construction and opening of the 600,000-square-foot facility.

"Building our new headquarters was a very involved project, and each decision we made throughout the process was carefully examined," Hoenic told employees at the ceremony. "It is rewarding to see how those efforts have paid off."

Since 2008, the headquarters workforce has nearly doubled to about 1,600.

Learn more about the history of the Kansas City Fed at www.KansasCityFed.org/aboutus/history.



Edwards selected to lead Kansas City Fed's diversity and inclusion programs

In March, the Federal Reserve Bank of Kansas City appointed Tammy Edwards as director of the bank's Office of Minority and Women Inclusion (OMWI).

While leading development and implementation of diversity and inclusion strategies, Edwards continues to serve as vice president of Community Development and Strategic Engagements for the seven states of the Federal Reserve's Tenth District. In that role she leads engagement initiatives for strategic stakeholders and directs programs that address challenging community and economic development issues that affect underserved individuals and communities.

Edwards joined the Kansas City Fed in 2008 after holding various leadership positions at Sprint Corp. She regularly presents on leadership and community and economic development topics, and she co-edited the 2015 book, "Transforming U.S. Workforce Development Policies for the 21st Century."

This year Edwards completed a leadership development program that included shadowing Robert S. Kaplan, president of the Federal Reserve Bank of Dallas. The program, administered by the Federal Reserve's Conference of First Vice Presidents, encourages leaders to work with senior management at other Reserve Banks to gain insight and share ideas.

About OMWI

The Office of Minority and Women Inclusion oversees the Kansas City Fed's diversity practices, including employee recruitment, community partnerships and vendor contracts.

"We are committed to building a diverse workplace and are continually striving to achieve this goal," bank President Esther George says in the OMWI mission statement. "As such, we provide equal employment opportunities

regardless of race, color, religion, sex, national origin, age, disability, sexual orientation or genetic information. All employees, regardless of what makes them unique, have the opportunity to succeed at the Kansas City Fed."

The creation of OMWI was part of a broad package of financial industry reforms contained in the Dodd-Frank Wall Street Reform and Consumer Protection Act. Each year, the Kansas City Fed delivers a report to Congress that highlights the bank's work to meet the requirements of the Dodd-Frank Act.

Read the Kansas City Fed's annual OMWI reports to Congress and learn more about the bank's diversity and inclusion mission at <https://www.kansascityfed.org/aboutus/kcfedinformation/diversity>.



Vice President and OMWI Director Tammy Edwards leads a Teach Children to Save lesson.

Book explores roots, relevancy, evolution of banking in the United States

The Federal Reserve Bank of Kansas City's Tenth District is home to more Federal Reserve state-member banks than any other Federal Reserve District. The community banks of today trace their lineage to the founding days of the United States. The Kansas City Fed recently released a book that helps shed some light on how our country's banking system was created and why its structure is important to understand.

Kansas City Fed historian Tim Todd wrote the book, *State Banking and the Dawn of the U.S. Economy*, to help readers understand more about the history of U.S. banking and the impetus for creating banks during the earliest Colonial days.

"The book stresses that the dual banking system in general, and state and community banks in particular, are very much a reflection of the core American values," Todd said. "Both in how they address distribution of power and authority, and also the important source of credit banks provide and how that credit gave rise to our economy."

To request a hard copy, download a PDF copy of the book or watch a video about the subject matter, go to www.kansascityfed.org/publications/aboutthefed/statebankingandeconomy.

The book dives deep into the history of each colony and the stumbles and victories that the colonists encountered with developing systems for payments, credit and managing debt.

"Many people think the banking system just happened to come together in the way it did, and that isn't true at all," Todd said. "There is definitely a connection between the innovation in creating our financial system that led to the U.S. being a world-leading economic power it is today."



Students pitch entrepreneurial ideas at Money Smart KC event



PHOTO BY GARY BARBER

Rebecca Gubbels (left) from the University of Missouri-Kansas City joined Sarah Cousineau and Bill Dana from Central Bank to present the “Shark Tank” \$1,000 first-place award to the Raytown South High School team: (from left) Joshua Blew, Jacob Dodd, Kurt Ramirez and Alex Omorodion.

The Kansas City Fed recently hosted Money Smart KC Live to recap a successful month of programs and initiatives designed to promote financial understanding among people of all ages.

Teach Children to Save, a program designed to impart financial knowledge to kindergarteners through third-graders, reached more than 8,200 students in the Kansas City area. The event also gave local high school students a chance to practice entrepreneurial skills in a “Shark Tank” youth competition administered by the University of Missouri-Kansas City Office of Financial Literacy.

Ten teams from Kansas City area schools originally submitted proposals for a product or idea that would work as a pop-up concept to attract visitors to Kansas City. Of those 10 teams, six were selected to present their ideas at Money Smart KC Live. Ideas ranged from a food truck converted into a device charging station to a clothing shop that would donate to a charitable cause.

The first-place team, representing Raytown South High School, presented an idea called Parking Buddy, an easily installed back-up camera for vehicles that would be attached to a license plate cover and link to a smartphone. The Parking Buddy team—Kurt Ramirez, Jacob Dodd, Joshua Blew and Alex Omorodion—received a \$1,000 award from Central Bank of Kansas City.

The second-place team, from Lincoln College Preparatory Academy, received a \$500 award for developing a pop-up shop to rent eyeglasses and ear pieces to individuals who have light or noise sensitivity.

“The Shark Tank Youth Contest is great because it gives high school students a unique opportunity to learn about valuable personal finance concepts through an immersive platform” said Gigi Wolf of the Kansas City Fed, who is a leader of Money Smart KC.

Download free financial education resources from the Kansas City Fed at www.KansasCityFed.org/education.

Feedback invited on bridging the digital divide

The Federal Reserve Bank of Kansas City is conducting a survey of community organizations working toward improving digital access and training. The survey's objectives are to gain clarity about current needs in Tenth District communities and help identify innovative steps toward digital inclusion. Results will be shared later this year.

Representatives of community organizations with programs or services working to bridge the digital divide are encouraged to take the survey at <https://www.kansascityfed.org/publications/community/connections> and view the article titled "Why Digital Inclusion Matters."

Senior Community Development Advisor Jeremy Hegle, who is leading the bank's digital inclusion initiative, invited community leaders, educators and others to share their insight during recent listening tours in Kansas City, Oklahoma City, Omaha and Cheyenne, Wyo.

Hegle points out that digital access increasingly is required to obtain an education, secure and sustain employment, utilize financial services or successfully operate small businesses.

However, while the need is growing, disparities across communities remain. According to a 2016 Federal Communications Commission report, 34 million Americans lack access to fixed broadband service, defined as download speeds of 25 megabits per second (Mbps) and upload speeds of 3 Mbps. This population is disproportionately rural and poor:

Bank Anniversaries



The following banks in the Tenth Federal Reserve District are celebrating one, five, 10, 20 or more years as Federal Reserve members in July, August and September.

Uinta Bank	Mountain View	Wyo.	98
Wahoo State Bank	Wahoo	Neb.	86
Gunnison Bank and Trust Co.	Gunnison	Colo.	78
Union State Bank	Clay Center	Kan.	76
Bank of Holyrood	Holyrood	Kan.	75
Farmers Bank of Lincoln	Lincoln	Mo.	74
Security State Bank	Basin	Wyo.	70
Bank of Cushing	Cushing	Okla.	38
My Bank	Belen	N.M.	26
Five Points Bank	Grand Island	Neb.	21
State Bank of Burrton	Burrton	Kan.	21
America's Community Bank	Blue Springs	Mo.	20
American State Bank and Trust Co.	Great Bend	Kan.	10

- 39 percent of rural Americans (23 million people) lack broadband access.
- According to Pew Research Center, 53 percent of adults with incomes lower than \$30,000 have broadband access at home, compared with 93 percent of those with incomes above \$75,000.



The Federal Reserve System

Congress created the Federal Reserve in 1913 to bring financial stability after a number of banking panics. It is the nation's third central bank. The first, established in 1791, and the second, created in 1816, were each operational for 20 years. In both cases, its charter failed to be renewed and the banks closed.

With the Federal Reserve Act, Congress sought to create a central bank the public would be more likely to support by making it "decentralized" with more local control. This new structure was designed to overcome one of the primary weaknesses of the previous central banks: public distrust of an institution that many felt could potentially be under the control of either government or special interests. The new central bank is a network of 12 regional Federal Reserve Banks, located throughout the country and under the leadership of local boards of directors, with oversight from the Board of Governors, a government agency in Washington, D.C.

The Federal Reserve is considered to be independent within government and broadly insulated from political pressures. While members of the Board of Governors are nominated by the president of the United States and confirmed by the Senate, the Federal Reserve's regional structure, including local boards of directors and advisory councils, ensures that views from a broad spectrum of the public nationwide contribute to the central bank's deliberations.

President Woodrow Wilson signed the Federal Reserve Act Dec. 23, 1913, and the 12 regional Federal Reserve Banks opened Nov. 16, 1914.

The Federal Reserve Bank of Kansas City



The Federal Reserve Bank of Kansas City and its Branches in Denver, Oklahoma City and Omaha serve the Tenth Federal Reserve District, which encompasses Colorado, Kansas, western Missouri, Nebraska, northern New Mexico, Oklahoma and Wyoming. As a part of the Federal Reserve System, the Bank participates in setting national monetary

policy, supervising and regulating numerous commercial banks and bank holding companies, and providing other services to depository institutions.

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EDITOR: Stan Austin

ART DIRECTOR: Angela Anderson

MAGAZINE DESIGNER: Gary Barber

CONTRIBUTING WRITERS: Su Bacon, Sarah Pope

RESEARCH CONTRIBUTORS: Alison Felix, Jun Nie, Amy Oksol, Didem Tüzemen

COVER PHOTO BY: Bob Greenspan

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Federal Reserve Bank of Kansas City
1 Memorial Drive
Kansas City, MO 64198-0001

CHANGE SERVICE REQUESTED



Whether you're a Fed watcher or know little about the nation's central bank, "Kids Ask the KC Fed" provides insight through America's younger citizens.

The series of short interviews is based on questions children have asked when visiting the Kansas City Fed. The questions — asked by a child host to a Kansas City Fed employee — focus either on a particular job or an aspect related to the Bank's work or both. **Go to the "KansasCityFed" channel at YouTube.**