ECON FOCUS

Breaking Away

When Regions Seek Independence

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Creating the Richmond Fed's Bailout Barometer

The Richmond Fed recently released new estimates of the size of the financial sector's government-provided safety net — a measure that we call the "bailout barometer." According to these estimates, 60 percent of the financial sector's liabilities — $25 trillion — are either explicitly or implicitly insured by taxpayers. Explicit guarantees include programs like deposit insurance for banks, while implicit guarantees cover liabilities for which market participants believe the government will provide support in times of distress. In some cases, these expectations have developed over time following earlier government bailouts of firms or markets deemed "too big to fail" (TBTF).

The size of the financial safety net is critically important. While guarantees against losses can help prevent panics by reassuring creditors, they also erode incentives for firms to minimize risk. Protected creditors have little incentive to be concerned over the riskiness of financial institutions' activities and will thus overfund risky activities. As financial firms grow in size and riskiness, policymakers may be motivated to protect them during times of distress to prevent damage to the rest of the economy. Such actions can increase the size of explicit and implicit safety net guarantees alike, however, creating a vicious cycle that perpetuates TBTF.

Despite legislation such as the Dodd-Frank Act aimed at eliminating the TBTF problem, the size of the safety net has remained roughly unchanged since 2009, and — as the cycle described above would predict — it has grown considerably since Richmond Fed researchers published our first bailout barometer estimates in 2002. I asked them to create the measure after I became director of research at the Richmond Fed in 1999. There was growing concern among policymakers and economists about TBTF at the time but no good estimate of just how large the financial safety net was.

Our researchers estimated that nearly 45 percent of financial sector liabilities in 1999 were either explicitly or implicitly protected by government guarantees. I was surprised by how high that number was. Industry experts and banking regulators in the 1990s had been saying that the banking industry was declining as a share of financial intermediation, as more nonbanks, like money market mutual funds, provided services traditionally handled by banks. Because a large portion of the safety net was composed of protected assets in what I had assumed was the shrinking banking sector, I had expected it to be much smaller than what our researchers actually found.

In hindsight, the size of the safety net should have alerted me to another problem: Financial firms outside of the banking sector had an incentive to mimic the dependence of banks on the type of short-term funding that is likely to receive government assistance during a crisis. Such funding would be less costly if it was perceived as benefiting from an implicit government guarantee. But relying more heavily on cheap short-term funding that can suddenly dry up would also make those firms, and the financial sector as a whole, more fragile. In fact, this is exactly what we saw leading up to the financial crisis of 2007-2008.

Before the crisis, I had been optimistic that policymakers would take steps to prevent the growth of the safety net. In a paper I wrote in 1999 with Marvin Goodfriend, then a senior vice president and policy adviser at the Richmond Fed (now on the faculty at Carnegie Mellon University), we speculated that policymakers might gradually see that liberal lending during crises was counterproductive, since it exacerbated the TBTF problem in the long run. Thus, it seemed reasonable to think they would commit not to rescue failing institutions.

While I was optimistic that we were heading in this direction, Marvin was less sanguine. He believed that policymakers were likely to continue to favor short-term relief of financial distress over the long-term goal of shrinking the financial sector's federal safety net. In the end, the rescues of financial firms that our researchers previously assumed to be outside the safety net during the financial crisis of 2007-2008 proved that Marvin's fears were well-founded.

The long-term solution to this problem is to restore market discipline so that financial firms and their creditors have an incentive to monitor and reduce risk-taking. The government can facilitate this by credibly committing not to fund bailouts in future crises. The Dodd-Frank Act includes a number of provisions aimed at helping policymakers establish such a commitment, including its requirement that the largest and most complex financial firms create resolution plans known as "living wills." These are detailed road maps for how regulators can unwind failed firms without threatening the rest of the financial system or requiring government assistance. Our researchers will continue to update the bailout barometer to gauge the progress that is being made toward shrinking the problem of "too big to fail."   **EF**

JEFFREY M. LACKER
PRESIDENT
FEDERAL RESERVE BANK OF RICHMOND

UPFRONT

BY LISA KENNEY

Regional News at a Glance

MARYLAND — In May, the U.S. Supreme Court struck down a Maryland income tax law because it double-taxed residents' out-of-state income. Normally, income is taxed both where it is made and where taxpayers live, and states give a full credit for the income taxes paid on out-of-state earnings. Maryland levies so-called "state" and "county" taxes, but it allowed credits to be claimed only for the "state" taxes; the court said that both types of taxes in Maryland are actually state taxes.

NORTH CAROLINA — North Carolina's life sciences industry grew 31 percent between 2001-2012, more than four times the industry's national growth rate, according to a study released in March by the research firm Battelle. The study was prepared for the private nonprofit North Carolina Biotechnology Center, which is supported by the state's General Assembly. The report also found life science companies in the state were responsible for $73 billion in economic output in 2014 and accounted for 48 percent of all net new jobs in North Carolina from 2001-2012.

SOUTH CAROLINA — Gov. Nikki Haley announced in June that the state had paid off a nearly $1 billion loan from the federal government five months early. The loan was granted over five years ago to help with unemployment costs during the recession. The early repayment saved the state more than $12 million in interest payments. South Carolina was one of 36 states that borrowed from the federal government for their unemployment insurance funds in the last six years.

VIRGINIA — The state has launched a new business plan competition for entrepreneurs in bioscience and energy sectors. Virginia Velocity offers $850,000 in prizes that will be shared among at least four winners. It is open to all companies in these two sectors, including those based outside of Virginia if they are willing to relocate to the state for two years. Winners will be announced after the final presentations in Richmond in early September.

WASHINGTON, D.C. — Low-income D.C. residents are receiving assistance from a new program that outfits single-family homes with solar panels at no cost to the households. The Solar Advantage Plus Program is funded jointly by the D.C. Department of the Environment and the DC Sustainable Energy Utility, a partnership created by the 2008 Clean and Affordable Energy Act to administer sustainable energy programs in D.C. Households must meet certain income requirements to be eligible, as well as have their systems installed by Sept. 30.

WEST VIRGINIA — The state Supreme Court ruled in May that doctors and pharmacies that negligently prescribe and dispense pain medications can be sued for enabling addictions. The defendants argued that illegal actions by the plaintiffs in obtaining the drugs meant they could not seek damages. The court's decision stated that juries must weigh the plaintiffs' criminal conduct against any alleged negligence of doctors or pharmacists. In response, legislation effective May 25 prevents plaintiffs from receiving damages that arise as part of their own felony criminal acts.

Jekyll Island: Where the Fed Began

BY JESSIE ROMERO

On Nov. 24, 1910, a select group of men enjoyed a Thanksgiving dinner of wild turkey with oyster stuffing at the luxurious Jekyll Island Club, off the coast of Georgia. The resort offered a host of leisurely pursuits, but the men weren't there to golf or ride horses. Instead, the group was there to devise a plan to remake the nation's banking system. The meeting was a closely guarded secret and would not become widely known until the 1930s. But the plan developed on Jekyll Island laid the foundation for what would eventually be the Federal Reserve System.

"Defects and Needs of Our Banking System"

Between 1863 and 1910, there had been three major banking panics and eight more localized panics in the United States. (Some modern scholars count as many as six major panics.) These panics stemmed in part from the country's "inelastic" currency: The supply of bank notes didn't expand and contract with the needs of the economy. This was an unintended consequence of the National Banking Acts of 1863 and 1864, which required all currency to be backed by holdings of U.S. government bonds. Because the aggregate supply of bonds was fixed for long periods, the aggregate supply of notes was also limited. In addition, for a bank to issue new notes, it had to purchase bonds, deposit those bonds with the U.S. Treasury, wait for Treasury to authorize printing the notes, and then wait for the notes to be printed and shipped. The entire process could take as long as three weeks. As a result, it was difficult for banks to provide enough currency during seasonal increases in demand, such as the fall harvest and the holiday shopping season. Banks also struggled to provide enough currency during the banking panics that accompanied many economic downturns, when many people would rush to withdraw their deposits at the same time.

The banking system at the turn of the century was also highly fragmented. The laws in most states barred banks from opening branches, so essentially every small town had its own bank, to the tune of more than 27,000 banks in the country in the early 1900s. These many small banks were connected to larger banks in the cities through a complex system of interbank deposits and clearinghouses that allowed strains to spread quickly throughout the entire financial system.

In many European countries, the currency was backed by commercial paper, the volume of which naturally expanded and contracted along with the economy. These countries also had central banks that rediscounted the commercial paper; by setting the discount rate, the central bank could help regulate the flow of currency. The central bank could also, in certain circumstances, act as a "lender of last resort" and provide loans to banks during times of crisis.

Bankers, businessmen, and policymakers were aware of the problems, and a number of groups were working on different proposals for currency reform. On Wall Street, however, a few young financiers were becoming interested in establishing a central bank.

A secret meeting at a secluded resort led to a new central banking system

The main clubhouse on Jekyll Island was a social hub for the island's wealthy visitors.

One of these bankers was Henry Davison, a partner at J.P. Morgan and Co. Davison started his career as an office boy at a small bank in Connecticut and rose quickly through the banking world, becoming vice president of the First National Bank of New York by age 35. In 1903, while at First National, Davison founded the Bankers Trust Company, which became the second-largest trust company in the country. Five years later, J. Pierpont Morgan asked Davison to join his firm.

Frank Vanderlip had followed a circuitous path to Wall Street. He grew up on a farm outside Aurora, Ill., and as a teenager took a job in a machine shop to support his family after his father died. He later worked as an editor at a small-town newspaper and then made his way to Chicago, where he joined the *Tribune* and eventually became the financial editor. When the Chicago banker Lyman Gage was appointed Treasury secretary, he asked Vanderlip to accompany him to Washington as his private secretary. Within months, Vanderlip had been promoted to assistant secretary, and his successful handling of the sale of $1.4 billion in Spanish-American War bonds drew the attention of Wall Street. He left Treasury for National City Bank, the forerunner of Citibank, in 1901 and became president of the bank eight years later.

Paul Warburg, a partner at the investment bank Kuhn, Loeb and Co., was one of the most vocal critics of the U.S. banking system. (Kuhn, Loeb merged with Lehman Brothers in 1977.) Warburg was born in Germany to a wealthy banking family, and he worked in Hamburg, London, and Paris before moving to the United States in 1902. He gave numerous speeches and wrote articles about the virtues of a central bank, including "The Defects and Needs of Our Banking System," which ran in the *New York Times* on Jan. 6, 1907. In it, he noted that the United States' banking system was at "about the same point as was reached by Europe at the time of the Medicis and by Asia, in all likelihood, at the time of Hammurabi." He advocated a system like that used by European countries, in which a central bank issued currency backed by short-term commercial loans. "We have reached a point in our financial development," he wrote, "where it is absolutely necessary that something be done to remedy the evils from which we are suffering."

The Panic of 1907
Those evils surfaced once again during the Panic of 1907, when a run on the Knickerbocker Trust Company spread to other New York City trusts and banks. J.P. Morgan returned to New York from a trip to Richmond, Va., to figure out how to stop the panic. The first step was to determine which trust companies were worth saving, a task he assigned to Davison, then still at First National, and to Benjamin Strong, whom Davison had hired as secretary of Bankers Trust. Davison and Strong could not assure Morgan that the Knickerbocker was sound, and Morgan did not intervene. The Knickerbocker failed on Oct. 22. But they judged the Trust Company of America (TCA) worthy of

support, and over the next several days Morgan assembled a group of bankers to make a $10 million loan to TCA and two loans of $25 million and $10 million to the New York Stock Exchange, quelling the panic. (John D. Rockefeller provided an additional $10 million to the trust companies.)

The Panic of 1907 wasn't the worst financial crisis of the National Banking era, but it got the attention of the older generation of New York bankers, who began to come around to their young colleagues' point of view. That's because it was fundamentally different from previous panics, according to research by Jon Moen of the University of Mississippi and Ellis Tallman, now at the Cleveland Fed. "The Panic of 1907 happened in trusts, in a group of intermediaries outside the New York Clearinghouse and outside the purview of the national banks," says Moen. "The New York bankers realized that if the next panic were any bigger, their banks wouldn't collectively have enough assets to stop it. A lot of the older bankers hadn't thought a central bank was necessary, but they changed their tune very quickly."

The Panic of 1907 also got the attention of Republican Sen. Nelson Aldrich, the chair of the Senate Finance Committee. Aldrich was one of the most powerful politicians of his time: President Theodore Roosevelt dubbed him the "kingpin" of the Republicans, and journalists called him (not fondly) the "boss of the United States." Aldrich was a key political ally of Morgan, and many of his fellow legislators were suspicious of his wealth and his ties to business and finance, including his daughter's marriage to John D. Rockefeller Jr.

In response to the panic, Aldrich pushed through a bill in 1908 that, among other things, created the National Monetary Commission to study reforms to the financial system. (The bill was co-sponsored by Republican Rep. Edward Vreeland.) The Commission included eight senators and eight representatives, with Aldrich as chair. But in Aldrich's opinion, "The drafting of a bill was a matter for experts, not members of Congress inexperienced in banking and financial matters," as economic historian Elmus Wicker wrote in *The Great Debate on Banking Reform*. So Aldrich hired several advisers, including Davison and A. Piatt Andrew, an economics professor at Harvard University, and set off to meet with bankers and central bankers in Europe. "He had been very shrewd in making up the commission," wrote Nathaniel Wright Stephenson in a 1930 biography of Aldrich. "It had three parts: those whose names were valuable but who would not want to go to Europe and so would not hamper the work; those who would like to go to Europe but would be willing enough to be excused from real work; those who meant business."

When Aldrich left for Europe, he supported the existing bond-backed currency and was skeptical about the necessity of a central bank. But his meetings persuaded him that the European system was worth emulating, and after returning home he asked Paul Warburg to give a presentation at the Metropolitan Club of New York. Warburg had written Aldrich several letters about his views on financial reform and was surprised by the senator's change of heart. But

Warburg was also doubtful the American public would accept a central bank, no matter the benefits. Aldrich was more optimistic. "I like your ideas — I have only one fault to find with them," he told Warburg. "You say that we cannot have a central bank, and I say we can."

The Duck Hunt

By the fall of 1910, Aldrich had learned a great deal, but he didn't actually have a plan for a central bank. Nor did he have a bill to present to Congress, which would begin meeting in just a few weeks. So Aldrich — most likely at Davison's suggestion — decided to convene a small group to hash out the details. The group included Aldrich, his private secretary Arthur Shelton, Davison, Andrew (who by 1910 had been appointed assistant Treasury secretary), Vanderlip, and Warburg.

A member of the exclusive Jekyll Island Club, probably J.P. Morgan, arranged for the group to use the club's facilities. Founded in 1886, the club's membership boasted elites such as Morgan, Marshall Field, and William Kissam Vanderbilt I, whose mansion-sized "cottages" dotted the island. *Munsey's Magazine* described it in 1904 as "the richest, the most exclusive, the most inaccessible" club in the world.

Aldrich and Davison chose the attendees for their banking expertise, but Aldrich knew their ties to Wall Street would arouse suspicion about their motives. "Knowledge of who wrote the plan could have influenced people's perception of the value of the ideas and the likelihood of its political passage," says Gary Richardson, the Federal Reserve System historian and an economics professor at the University of California, Irvine. So Aldrich went to great lengths to keep the meeting secret, adopting the ruse of a duck hunting trip. He instructed the men to come one at a time to a train terminal in New Jersey, where they could board his private train car. Warburg went so far as to bring all the trappings of a duck hunter, when in fact he had never shot a duck in his life. Andrew didn't even tell his boss, the Treasury secretary, where he was going.

So secretive was the meeting that even the exact list of participants is lost to history. In his autobiography, Vanderlip says Benjamin Strong attended and recalls him horseback riding before breakfast. But Strong is absent from other historical accounts, including Warburg's first-person recollections. Strong was named the first president (then called governor) of the New York Fed, and "during the 1920s he was heralded as being the only person who really knew what a central bank was supposed to do," says Moen. "So it was assumed later he was there, but there really isn't any evidence he took part in the meeting."

Once aboard the train, the men used only their first names with each other. Vanderlip and Davison went even further, as Vanderlip wrote in his autobiography: "Davison and I adopted even deeper disguises, abandoning our own first names. On the theory that we were always right, he became Wilbur and I became Orville." Vanderlip and Davison would continue to call each other Wilbur and

Orville for years, and the men referred to themselves as the "First Name Club" for decades.

The Plan Takes Shape

Aldrich and his colleagues quickly realized that while they agreed on broad principles — establishing an elastic currency supplied by a bank that held the reserves of all banks — they disagreed on the details. Figuring out those details was a "desperately trying undertaking," Warburg told Davison's biographer, Thomas Lamont; completely secluded, the men woke up early and worked late into the night for more than a week. "We had disappeared from the world onto a deserted island," Vanderlip recalled in his autobiography. "We put in the most intense period of work that I have ever had." But it was also, Vanderlip wrote, "entirely thrilling."

By the end of their time on Jekyll Island, Aldrich and his colleagues had developed a plan for a Reserve Association of America, a single central bank with 15 branches across the country. Each branch would be governed by boards of directors elected by the member banks in each district, with larger banks getting more votes. The branches would be responsible for holding the reserves of their member banks, issuing currency, discounting commercial paper, transferring balances between branches, and check clearing and collection. The national body would set discount rates for the system as a whole and buy and sell securities.

Shortly after returning home, Aldrich became ill and was unable to write the group's final report. So Vanderlip and Strong — who was a member of the "First Name Club" even if he hadn't been on Jekyll Island — traveled to Washington to get the plan ready for Congress. Aldrich presented it to the National Monetary Commission in January 1911, without telling the commission members how the plan had been developed. A final report, along with a bill, went to Congress a year later with a few minor changes, including naming the new institution the National Reserve Association.

In a letter accompanying the report, the Commission (that is, the Jekyll Island attendees) said they had created an institution "scientific in its methods, and democratic in its control." But many people, especially Democrats, "hated the version of democracy it presented," says Richardson. "The Aldrich plan presented a reform of the financial system that was the kind of plan many Americans feared. It looked like the biggest banks would have an outsized influence on the leadership, like bankers in New York would through their control of finance and credit be able to control the country and rig the system."

With a presidential election coming up, the Democrats made it part of their platform to repudiate the Aldrich plan and the idea of a central bank more generally. When Woodrow Wilson won the presidency and the Democrats took control of both houses, Aldrich's National Reserve Association was officially shelved.

But some Democrats also were interested in financial reform, in particular Carter Glass, a congressman from Virginia. Glass had developed a plan for a system of separate

regional reserve banks, as opposed to a central bank with regional branches, as in the Aldrich bill. At President Wilson's insistence, Glass also included a Federal Reserve Board composed of presidential appointees to provide federal oversight. But in its technical details, the Democrats' final bill closely resembled the Aldrich bill. "What people were really upset about was the political structure of Aldrich's plan. So the Democratic reply was a proposal that used the same technical infrastructure and policy tools. A lot of it is word for word. They just put a different political structure in place," says Richardson. The combination of regional independence and federal oversight was more to the public's liking, and the Federal Reserve Act, a combination of Glass's bill and a bill introduced by Sen. Robert Owen, became law in 1913.

Postscript

In 1917, the journalist B.C. Forbes, the founder of *Forbes* magazine, somehow learned about the Jekyll Island trip and wrote about it in *Men Who Are Making America*, a collection of short biographies of prominent financiers, including Davison, Vanderlip, and Warburg. But not many people noticed the revelation, and those who did dismissed it as "a mere yarn," according to Aldrich's biographer.

The participants themselves denied the meeting had occurred for 20 years, until Andrew, Vanderlip, and Warburg shared the story with Aldrich's biographer in 1930. (Aldrich died in 1915 and Davison in 1922.) The impetus for coming clean was probably the publication in 1927 of Carter Glass' memoir, *An Adventure in Constructive Finance*. In it, Glass, by now a senator, had claimed all the credit for the ideas in the Federal Reserve Act. After that, Richardson says, "The other people who contributed, particularly the Jekyll Island guys, came out with books and articles to talk about their role in creating the Aldrich plan."

Warburg was especially critical of Glass' description of events. In 1930, he published a two-volume book describing the origins of the Fed, including a line-by-line comparison of the Aldrich bill and the Glass-Owen bill to prove their similarity. In the introduction, he wrote, "I had gone to California for a three months' rest when the appearance of a series of articles written by Senator Glass ... impelled me to lay down in black and white my recollections of certain events in the history of banking reform." (Warburg's book does not mention Jekyll Island specifically, although he alludes to a secret meeting with Aldrich.)

The Jekyll Island Club never bounced back from the Great Depression, when many of its members resigned, and it closed in 1942. Today, its former clubhouse and cottages are National Historic Landmarks, and the secret meeting that launched the Federal Reserve is a historical curiosity for the many tourists who visit the island. But the issues Aldrich and his colleagues wrestled with over Thanksgiving more than 100 years ago remain relevant today, as policymakers and the public continue to debate the structure and powers of the Fed.   **EF**

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BAILOUT BAROMETER:
How Large is the Financial Safety Net?

The Richmond Fed estimates that 60 percent of the liabilities of the financial system are subject to explicit or implicit protection from loss by the federal government. This protection may encourage risk-taking, making financial crises and bailouts more likely.

Learn more at: www.richmondfed.org/publications/research/special_reports/safety_net

Risk Retention Contention

BY DAVID A. PRICE

In recent decades, financial assets such as home mortgages, auto loans, and credit card receivables have commonly been securitized — that is, investment firms combine them into pools and sell interests in those pools to investors as securities. The process of securitizing creates new options for investors while also creating new sources of funding for borrowers, lowering their cost of borrowing. In the period leading up to the 2007–2008 financial crisis, however, many mortgage-backed securities (MBS) lost value from borrower defaults, fueling the collapse of major institutions.

In response, when Congress passed the Dodd-Frank Act in 2010, it included a requirement that issuers of some securitized investments retain a portion of those securities in their own portfolios — the Act's "risk retention" requirement. The law requires issuers to retain 5 percent of the securities, with certain exceptions, and they are largely forbidden to hedge the risk that they retain. In October 2014, the Fed and five other regulatory agencies jointly announced the final version of the regulations for risk retention, which will take effect for securitizers of some MBS on Dec. 24, 2015. The regulations will take effect for securitizers of other assets a year later.

The idea behind the risk retention requirement is that during the period before the financial crisis, sellers of MBS deceived investors about the riskiness of the mortgages. The sellers were able to carry out the deception, in this view, as the result of asymmetrical information: The investors lacked information about the mortgages and their underwriting standards, and the pools were structured in a complex way that was difficult for investors to make sense of. Risk retention forces securitizers to keep some skin in the game, so to speak, so that they are subject to the same credit risk as the investors.

The statute and regulations provide for a number of exemptions to the requirement. Perhaps the most significant exemption is that, under the Dodd-Frank Act, a securitizer does not need to retain risk if all of the securitized assets in a pool are mortgages that meet a standard of safety; such mortgages are known as qualified residential mortgages (QRM). Congress largely left it up to the agencies to define which mortgages are QRM and which are not.

In the final regulations, the agencies defined QRM in a way that created a broad exception; they did so by defining QRM to mean the same as a "qualified mortgage" under the Truth in Lending Act. As a result, mortgages can be exempt from the risk retention requirement without having any

minimum down payment. According to a *New York Times* report, higher standards for the exemption were opposed by a coalition of mortgage lenders and consumer groups concerned about mortgages becoming more difficult to obtain. A commissioner of the Securities and Exchange Commission, Daniel Gallagher, dissented from the decision, stating that the agencies' standard was "meaningless at best, deleterious at worst."

The importance of risk retention to avoiding a future crisis is an open question, however. Economist Paul Willen of the Boston Fed noted in a 2014 article that institutions selling MBS prior to the financial crisis held significant amounts of it in their portfolios. "Indeed," he wrote, "the financial crisis resulted precisely from the fact that the losses associated with the collapse in the housing market were so concentrated in the portfolios of the intermediaries."

> Risk retention forces securitizers to keep some skin in the game so that they are subject to the same credit risk as the investors.

A 2008 analysis by economists Kristopher Gerardi of the Atlanta Fed, Andreas Lehnert and Shane Sherlund of the Fed's Board of Governors, and Willen of the Boston Fed suggests that the underlying issue was not a lack of risk retention, but unwarranted optimism about the housing market. In an article in Brookings Papers on Economic Activity, they examined reports from investment bank analysts, credit rating agencies, and the news media on subprime MBS from 2005 and 2006. They found that the likely effects of a housing downturn on MBS values were understood; where the analysts erred was in assigning a low probability to even a modest downturn, let alone a major one.

Another question is whether MBS buyers will demand risk retention or some other protective arrangement in the absence of a risk retention rule. Richmond Fed economist John Walter suggests that in the absence of the expectation of a government bailout, institutions will seek to do so.

"The lender has some information advantages, but asymmetric information problems occur in the economy all the time," Walter says. "For instance, cars are highly complex and it's hard for purchasers to know their quality. The way manufacturers and dealers respond is to retain some of the risk with warranties. Regulators don't require warranties, but this solution has emerged from market incentives."

While many low-quality mortgages were made before the crisis, Walter says, that is in part because the parties to the MBS deals were perceived as "too big to fail" or were doing business with "too big to fail" firms. "Coming up with prescribed solutions to this asymmetric information issue is dealing with the symptom, not the underlying problem." **EF**

Statistical Significance

BY EAMON O'KEEFE

A drug company has developed a new treatment for high cholesterol. It finds that patients who take the new drug experience fewer heart attacks and other negative effects from the condition. But how confident are we in those results? This is the question of statistical significance, and it can be applied to the social sciences to help economists better determine the effects of a certain policy change or business decision.

To determine statistical significance, a researcher begins by creating a null and an alternative hypothesis to test if a relationship exists between two events or characteristics. The null hypothesis typically states that no relationship exists, and the alternative hypothesis asserts that a relationship does exist. For example, an economist might suspect a rise in the minimum wage will affect the employment of less-skilled workers. The null hypothesis would be that, on average, there is no change in the unemployment rate for less-skilled workers after a state raises its minimum wage. The alternative hypothesis would be that there is a change in unemployment after an increase in the minimum wage.

Suppose the economist runs a regression analysis and the coefficient on the minimum wage variable is positive — suggesting a possible correlation between unemployment for less-skilled workers and a state's minimum wage. The next step is to determine our level of confidence in that result. Researchers use what is called a p-value to communicate the probability of finding a relationship when no such relationship exists. If the p-value is below a certain threshold — 5 percent is commonly used — the relationship is deemed statistically significant and the null hypothesis can be rejected.

Of course, correlation is not the same as causation. Just because a change in one variable coincides with a change in the other does not necessarily mean they cause one another. For example, playing tennis might be correlated with wealth, but unless one is a professional tennis player, it won't lead to greater wealth. Without a controlled experiment, it's very difficult to prove causality. Controlled experiments are relatively rare in economics; for example, it's unlikely that legislators would allow an economist to tinker with their state's minimum wage in the name of scientific inquiry. But economists can take advantage of "natural experiments," such as one state raising its minimum wage while a neighboring state leaves its wage unchanged. Or they can use statistical techniques to control for other factors that might affect employment. A considerable amount of research has used such methods to study the minimum wage. Most studies have found disemployment effects, although the magnitude varies considerably. (See "Raise the Wage?" *Econ Focus*, Third Quarter 2014.)

Just as it's important to distinguish between correlation and causation, it's also important to distinguish between statistical significance and economic significance. Statistical significance is about your confidence in the result, but just because a result is statistically significant doesn't mean the result is large or meaningful. For example, say a large increase in the state minimum wage caused a few people in that state to lose their jobs. The statistical relationship might be strong, but the magnitude of job loss could be small enough to be inconsequential to policymakers.

The problem of error is implicit in any discussion of statistical significance. There exists, in a statistical test, the possibility for two types of error: type 1 and type 2. A type 1 error indicates a "false positive" or rejecting the null hypothesis when it is true. A type 2 error is when one accepts the null when it is false. Both can be problematic, but the extent to which the researcher is concerned about the error depends on the question being explored.

It's important to take type 1 and type 2 errors into account when considering the threshold for statistical significance. The smaller the p-value, the higher the bar for significance. So a researcher who is especially concerned about making a type 1 error might look for significance well below 0.05. In a 2012 column, Carl Bialik, the *Wall Street Journal*'s "The Numbers Guy," detailed how this concept was used to validate the existence of the elusive Higgs boson particle — sometimes referred to as the "God particle." Researchers used a statistical significance of "five sigmas" to reject a result with a p-value greater than one in 3.5 million. They wanted to set an extremely high burden of proof for discovering a new particle in the universe.

This discussion of error can be applied to other questions society faces. For example, many might argue that determining guilt in a death penalty case should require a higher burden of proof than in a normal trial. Implicitly, one is determining a p-value in this situation because it is desirable to have a very low probability of type 1 error (convicting someone and sentencing them to death for a crime they didn't commit).

In a sense, then, statistical significance reflects value judgments. Setting a high or low p-value indicates a researcher's belief about what constitutes significance — an additional nuance to be mindful of when interpreting research findings.   **EF**

Superstars of Tax Flight

BY KARL RHODES

On Feb. 16, 2013, the *New York Times* published an opinion column, "The Myth of the Rich Who Flee From Taxes." On the following day, *Forbes* magazine countered with an online commentary, "Sorry New York Times, Tax Flight of the Rich Is Not a Myth."

The articles cited anecdotes of wealthy celebrities moving from high-tax states and nations, but data tracking the international mobility of large random samples of wealthy people over long periods of time is difficult, if not impossible, to find. So some economists have addressed this question by looking at observable subsets of wealthy populations. In 2013, for example, researchers from the London School of Economics (Henrik Kleven and Camille Landais) and the University of California, Berkeley (Emmanuel Saez) studied the mobility of professional soccer players among 14 Western European nations from 1985 through 2008. They found that the players — especially foreign "superstars" — do tend to migrate to countries with lower tax rates. (The authors defined "foreign" players as those who are not competing in their home countries.)

A more recent example comes from a 2015 working paper by Ufuk Akcigit and Salomé Baslandze of the University of Pennsylvania and Stefanie Stantcheva of Harvard University. They study the impact of effective top tax rates on inventors' mobility; in particular, they look at inventors' movement among the United States, Canada, France, Germany, Great Britain, Italy, Japan, and Switzerland from 1977 through 2003. Inventors from these eight countries account for most of the patents issued by the U.S. Patent and Trademark Office and the European Patent Office.

For inventors who obtained patents in the United States, the authors employ panel data that was disambiguated recently by researchers at Harvard, Berkeley, and other institutions. (Disambiguation untangles name variations that could make one inventor appear to be multiple people and name duplications and similarities that could make multiple inventors appear to be one person.) For inventors who obtained patents in Europe, the authors use disambiguated panel data from the CRIOS-PatStat database developed by researchers at Bocconi University in Italy. By combining information from both sources, Akcigit, Baslandze, and Stantcheva are able to track most of the inventors who obtained patents during their study's timeframe.

The authors sort these data into "quality distributions" that rank each of the 1,868,967 inventors in their sample based on several factors related to the quantity and quality of his or her patents. The key indicator of an inventor's quality

> "Taxation and the International Mobility of Inventors." Ufuk Akcigit, Salomé Baslandze, and Stefanie Stantcheva. National Bureau of Economic Research Working Paper No. 21024, March 2015.

is his or her number of citation-weighted patents. A citation occurs whenever an inventor's patent is referenced by a later patent. The resulting accumulation of citations varies widely among inventors. The average inventor in the sample has 42 citations, for example, while the average inventor in the top 1 percent of the sample has more than 1,000 citations. The authors refer to the top 1 percent as "superstars ... key drivers of economic growth."

Akcigit, Baslandze, and Stantcheva combine this patent data with international tax data to estimate each inventor's potential earnings in each country based on factors such as numbers of patents and citations and technological field. Other key considerations include whether or not an inventor works for a multinational corporation and how active that company is in each potential destination country. (Inventors who work for multinationals tend to be more mobile.)

The authors then develop a model to estimate elasticities with respect to effective top tax rates for domestic and foreign inventors. They find that top tax rates significantly influence location decisions among superstar inventors — especially foreign superstars. The elasticity for foreign superstars is 1.3, more than 30 times higher than for domestic superstars.

The elasticity of the domestic superstar inventors is somewhat lower than the elasticity of the domestic soccer players in the study by Kleven, Landais, and Saez. The authors of the soccer study speculate that the elasticity for soccer superstars may be greater than for other highly paid professionals because soccer superstars earn most of their income during just a few prime years and because professional soccer involves little country-specific capital. In addition, Akcigit, Baslandze, and Stantcheva point out that the soccer study considers migration only among Western European countries, while their inventor study also includes the United States, Canada, and Japan. "Expanding the [soccer] study to other continents might, one would expect, reduce the tax elasticities of migration," they suggest.

Both studies conclude that some wealthy individuals are substantially influenced by taxes when deciding where to live. The soccer research goes one step further by suggesting that tax-induced migration has translated into better-performing teams in lower-tax countries. The inventor study makes no parallel suggestion regarding higher levels of innovation from the migration of inventors, but it certainly raises the stakes from breakaway goals that win soccer games to breakthrough technologies that drive economic growth. **EF**

Economists and the Real World

BY TIM SABLIK

How important is it for economists to gain real experience with the markets they study in theory? Many of the founders of the discipline held other jobs before becoming professors. Nineteenth century French economist Léon Walras, who developed general equilibrium theory, worked as a journalist, novelist, railroad clerk, and bank director before becoming a professor at the age of 36. William Stanley Jevons, the 19th century British economist who helped develop the theory of marginal utility, initially studied the physical sciences and spent five years as a metallurgical assayer in Australia.

For much of the modern era, however, the careers of economists have seemed to stay close to the ivory tower of academia. Although hard data is limited, the typical path for a research economist appears to go from college straight into doctoral study with little or no experience outside the profession along the way. And according to a 2013 Inomics survey, employers of economists in the United States and Canada said that of nine factors in the selection of a job candidate, "experience in the private sector" was by far the least important.

Some critics have argued that such isolation from the real world is a cause for concern. For example, many claimed that economists failed to predict the 2007-2008 financial crisis because their models had become too detached from the way real financial markets operate.

But that image of academic isolation may not be wholly accurate today. Many academic economists have begun collaborating more actively with private firms and public institutions. This practice has become common in the discipline of market design, for example. Robert Wilson of Stanford University helped design auctions for the oil, communications, and power industries. Along with his former student Paul Milgrom of Stanford University and with Preston McAfee, who is now the chief economist at Microsoft, Wilson received the 2014 Golden Goose Award for designing the first spectrum auctions used by the Federal Communications Commission in 1994. Alvin Roth of Stanford University and co-winner of the 2012 Nobel Prize in economics collaborated with public schools in New York City and Boston to design algorithms to improve student placement in preferred schools and with doctors to arrange kidney transplant exchanges between pairs of donors and recipients.

"Market design is a team sport," Roth said in his Nobel acceptance speech. "And it is a team sport in which it is hard to tell who are theorists or practitioners because it blurs those lines."

Susan Athey of Stanford University says that it is "not an accident" that economists studying market design and industrial organization have collaborated heavily with real-world firms and institutions. "If you're trying to solve a real problem, you need to understand the full set of constraints to propose the best solution," she says. Her role as a consultant for Microsoft has influenced her research on Internet markets, such as online advertising.

Still, the choice to work in or collaborate with the private sector is not without downsides. Stints in the private sector, while providing valuable experience, can delay an economist's publication of papers, hampering his or her progress as a researcher. And economists who do publish research based on their private-sector work or collaboration can find themselves criticized for bias. Luigi Zingales of the University of Chicago has argued that economists who work with private firms face the same pressures and risk of "capture" as regulators. Since obtaining proprietary data often means establishing a good rapport with the firms that hold those data, economists may be more inclined to evaluate such firms favorably in their research.

This criticism was also levied against some financial economists following the 2007-2008 crisis. Athey says that for this reason, it has generally been easier for microeconomists studying questions unrelated to public policy to collaborate with industry. But even those economists can face stigma from their academic peers. "I got the impression that many of my peers thought I was selling out," she says. "They couldn't really understand why I was so confident my work with Microsoft was going to come back and improve my research."

Today, many of the leading empirical studies rely on large datasets collected by firms and government agencies. As a result, more economists seem willing to risk some criticism to obtain access to these data. In a 2014 article in *Science* magazine, Liran Einav and Jonathan Levin of Stanford University reported that 46 percent of papers published in the *American Economic Review* in 2014 relied on private or non-public administrative datasets, compared with just 8 percent in 2006.

"I think the profession is starting to normalize the idea of working with a firm to get access to data," says Athey. "Increasingly, people are recognizing that without this private sector data, we're just not going to be able to get a complete picture of trends which could end up being very important to the economy."

Such collaboration has helped enable research on consumer behavior, economic mobility, and high-frequency trading, among other topics. While most academic economists may never hold jobs in other fields, as Jevons and Walras did, collaboration with firms is increasingly bringing the real world into economic research.   **EF**

The Competitiveness of Inner Cities

BY LISA KENNEY

"Are America's Inner Cities Competitive? Evidence from the 2000s," Daniel A. Hartley, Nikhil Kaza, and T. William Lester, Federal Reserve Bank of Cleveland Working Paper No. 15-03, March 2015.

Are the majority of inner cities experiencing a renaissance thanks to rapid gentrification, or is growth limited to a small number of high-technology regions, resulting in inequality among metropolitan areas? These two narratives are at the center of new research from the Cleveland Fed, which looks at whether inner cities have become more competitive — that is, whether they have had net positive employment growth and an increase in the share of jobs located there.

The authors conclude that while there has been nationwide job growth in inner cities, it has not been enough to declare a renaissance in inner city America.

In their research, the authors look at three measures of employment. First, census tract level data from the Local Origin-Destination Employment Statistics program showed that inner city tracts added 1.8 million jobs between 2002 and 2011. This job growth was found in nearly all census divisions, and the inner city rate of growth nearly matched suburban tracts' rate of growth, 6.1 percent to 6.9 percent, respectively.

Inner cities also increased their share of metropolitan employment in 120 of the 281 metropolitan statistical areas studied — in addition to having positive employment growth — showing that competitive inner cities may not be uncommon, but they are not yet universal.

Finally, the authors look at the pattern of job growth within the inner cities. Job growth tended to occur faster in census tracts closer to downtown, with nearby population increases and recent residential construction. And even within competitive inner cities, the tracts with higher poverty levels had lower job growth than the tracts with lower poverty levels.

"Competing for Jobs: Local Taxes and Incentives," Daniel J. Wilson, Federal Reserve Bank of San Francisco *Economic Letter* 2015-06, Feb. 23, 2015.

There has been a debate about whether or not localities should use tax incentives to persuade businesses to relocate to certain areas. State and local governments across the country, including in the Fifth District — where, for example, South Carolina lured Boeing with a multimillion-dollar incentive package — have used these tools to increase the economic development in their regions.

These incentives can be broken into two categories: Discretionary incentives are created specifically for individual companies, while nondiscretionary incentives are available to all qualifying businesses.

In a recent *Economic Letter*, a San Francisco Fed researcher asks whether these incentive situations are a zero-sum game. That is, has economic activity simply been moving from one area to another? According to past research that the author reviews, the answer is mostly yes.

Past research has found that when tax incentives bring a company to a new locality, the move has an adverse effect on the old location. This means there is no net gain for the national economy.

The *Economic Letter* finds that local tax policy does influence the location decisions of companies, but that there is no consistent way to measure whether the benefits of these incentive policies outweigh the costs of lost tax revenue.

One large policy question is whether these tax incentives should be banned, as they are in most of the European Union. Standard economic theory suggests it may not be optimal for local governments to set tax policies because they do not factor in the negative effects their decisions will have on other areas; the central government may be better suited for this role. But the Tiebout model, posited by economist Charles Tiebout in 1956, says that competition for individuals and businesses forces local governments to be as efficient as possible in order to charge the lowest possible tax rate.

The author concludes that policy must "weigh the benefits of local choice ... against the cost of how changes in one area might negatively affect competing jurisdictions."

"How Cyclical Is Bank Capital?" Joseph G. Haubrich, Federal Reserve Bank of Cleveland Working Paper No. 15-04, March 2015.

The idea that bank capital is cyclical has been cited by some as one reason for the 2008-2009 financial crisis. But economist Joseph Haubrich of the Cleveland Fed wondered if bank capital was really cyclical at all. He finds that the answer depended on several factors, including time period, definition of capital ratio, and bank size.

Haubrich used both quarterly and annual data. The first quarterly dataset shows the ratio of total equity capital to total assets from fourth quarter 1959 to fourth quarter 2013; the second set shows the ratio of Tier 1 capital to risk-weighted assets from first quarter 1996 to fourth quarter 2013. There are also two sets of annual data, one from 1834 to 1980 and the other from 1875 to 1946. In the quarterly data, Tier 1 capital to risk-weighted assets is found to be moderately procyclical, while the quarterly equity to assets ratio does not show any cyclicality.

Small banks were the most procyclical, while the largest categories of banks showed more counter-cyclicality. **EF**

The Secession Question

What are the economic costs and benefits of nations breaking apart?

BY TIM SABLIK

I t was called a "once in a generation opportunity." Last September, Scottish voters took to the polls to decide the fate of their country's more than 300-year union with England. One side, clad in the blue and white of the Scottish flag, invoked Scotland's unique history and heritage and argued that they would be more prosperous on their own. But many in Scotland and the United Kingdom as a whole implored voters to reject independence, arguing, among other things, that it would be economically disastrous for everyone involved.

The referendum drew a record turnout: 3.6 million people, or nearly 85 percent of eligible voters. In the end, status quo won the day by a margin of 55 to 45. The debate didn't end there, however. This May, the Scottish National Party (SNP), which is the leading proponent of independence, secured 56 of Scotland's 59 seats in Parliament, prompting speculation about another referendum in the not too distant future. And the debate reinvigorated existing secession movements elsewhere. Catalonia, a region in northern Spain, is seeking its own vote on independence, and the Flemish nationalist party surged to power in Belgium following the Scottish referendum.

What prompts some regions to seek separation from their country? Having a distinct regional identity is a crucial component, as most secession movements appeal to cultural and historical differences between the region and the rest of the country. There are a number of catalysts that might inflame those differences. In the past, secessions have been sparked by disputes over religion, politics, or civil rights. But in a 2008 paper, Andrés Rodríguez-Pose and Richard Sandall of the London School of Economics traced the evolution of the arguments made in secession movements and found that they have shifted. "Identity has progressively been relegated in favour of the economy and the promise of an economic dividend as the other main motivating factor," they wrote.

This is certainly true of Scotland, Catalonia, and Flanders, which have focused heavily on economic issues. But can regions become economically better off going it alone?

A Perfect Union?

From a pure economic efficiency standpoint, countries are rarely better off splitting into smaller pieces. As Alberto Alesina of Harvard University and Enrico Spolaore of Tufts

University noted in their 2003 book *The Size of Nations*, there are several major advantages to being a large country. First, the per capita expenses of public goods with large fixed costs are lower in large nations. Taxes to support infrastructure like roads, schools, and national defense are spread across a bigger population. In the case of national defense, this means larger countries can also more easily support a larger military, arguably allowing them to better defend their territory.

Large nations also typically have bigger, more diverse internal markets. Smaller countries can seek this advantage to some extent by trading with the larger world market. Indeed, Alesina and Spolaore found a correlation between trade liberalization and the fragmentation and downsizing of nations. The early 20th century, which was marked by high protective tariffs and other trade barriers, was also a period in which countries maintained large empires. In a restrictive trade regime, it is advantageous to be a large nation or have multiple colonies with which to trade freely. Coincidentally or not, as countries have relaxed trade barriers, the number of nations has grown. In 1948, there were 74 countries; today, the United Nations recognizes 193. "As trade becomes more liberalized, small regions are able to seek independence at lower cost," wrote Alesina and Spolaore.

Still, small nations face costs to trade that larger countries can avoid. Even relatively open international borders impose some frictions. For example, researchers have found that even in the case of the very open trade relationship between the United States and Canada, internal trade remains preferred by market participants in both countries. Without internal trade barriers, a large country has efficient access to large domestic markets, avoiding trade frictions.

Furthermore, larger nations can support more diverse markets. To compete in international markets, small nations often specialize in a small number of goods or services. This lack of diversification can leave their economies more vulnerable to macroeconomic shocks, as witnessed during the financial crisis of 2007-2008 by the troubles in small economies like Iceland and Ireland.

With more diverse economies, larger countries are also better equipped to share risk among their territories. If certain regions of the country suffer greater losses than the nation as a whole during an economic crisis, the government can transfer tax revenues from more prosperous areas to provide aid. Even in non-crisis times, large countries are better equipped than small ones to smooth income across the country by transferring tax revenue from wealthy regions to help boost development in poorer regions.

But size has downsides as well. According to research on the political economy of secession, larger nations are more likely to have regions that strongly disagree about public policy. As a result, decisions intended to improve the welfare of the country as a whole, such as economic transfers, can benefit some regions at the expense of others.

"That creates the beginning of political resentment," says Ángel Ubide, a senior fellow at the Peterson Institute for International Economics.

In 2012, on September 11, Catalonia's national day, hundreds of thousands of people gathered in Catalonia's capital, Barcelona, to demand independence from Spain.

Taxing Their Patience

When a region has a strong independent identity and a higher average income relative to the rest of the country, resentment over wealth transfers can prompt residents to question whether they might do better on their own. In a 1987 *American Economic Review* article, the late economists James Buchanan and Roger Faith reasoned that just as individuals might "vote with their feet" and exit a country to escape unfavorable tax treatment, so might entire regions or political groups threaten secession if they believe they can achieve a more equitable tax treatment through a government that is closer to home.

This is a key argument in the debate between Catalonia and Spain. Catalonia's per capita gross domestic product is higher than Spain's as a whole and the region accounts for more than a quarter of all Spanish exports. In the aftermath of the financial crisis of 2007-2008, Catalonia's government argued that it was contributing more in tax revenue to the national government than it received in benefits, with the difference going to support poorer regions of the country.

"That led to the slogan, 'Spain steals from us,' and from there, 'we would better off alone,'" says Ubide. He notes that in most cases, the political platforms of regional parties are built around achieving gains for their regions from the center. Eventually, the parties reach the end of the road in terms of

Independence Votes Since World War II

Did not lead to independence		Led to independence
	1957	Guinea
	1961	Samoa, Jamaica
	1962	Algeria
	1964	Rhodesia, Malta
Comoros (one island)	1974	Comoros (three islands)
Aruba	1977	Djibouti
	1979	Saint Vincent and the Grenadines
Quebec	1980	
New Caledonia	1987	
	1990	Slovenia
	1991	Armenia, Azerbaijan, Croatia, Estonia, Georgia, Latvia, Lithuania, Macedonia, Turkmenistan, Ukraine, Uzbekistan
Montenegro	1992	Bosnia and Herzegovina
	1993	Eritrea
Quebec, Bermuda	1995	
Nevis	1998	
	1999	East Timor
	2006	Montenegro
	2011	South Sudan
Scotland	2014	

NOTES:
Jamaica: Voted to withdraw from West Indies Federation; became fully independent on its own in 1962.
Rhodesia: Unilaterally declared independence in 1965 but was not fully recognized internationally until 1980, when it became Zimbabwe.
Comoros: Although 95 percent of all voters supported independence, a majority on the island of Mayotte voted against it. In July 1975, the parliament declared the independence of the three remaining islands; Mayotte remains an overseas department of France.
Aruba: Although 95 percent of valid votes favored independence, in 1990 the transition process was postponed indefinitely at Aruba's request.
Nevis: 62 percent voted to secede from St. Kitts and Nevis, short of the necessary two-thirds.
Djibouti: 99.8 percent of voters chose independence over remaining a French territory; fraud accusations marred two prior referendums, in 1958 and 1967, which came out in favor of the territory remaining French.
SOURCE: Pew Research Center

the threat of secession to exert pressure on the rest of the country and obtain concessions on tax treatment. This may place a cap on the tax level countries can impose on wealthy regions in particular, since they would not want to risk damaging their own economy by letting those regions go.

On the other hand, such concessions can generate secession pressures from other regions. In a 1997 *Quarterly Journal of Economics* article, Patrick Bolton of Columbia University and Gérard Roland of the University of California, Berkeley pointed to Belgium as an example of this dynamic: "Less redistributive policies may prevent the more right-wing Flanders from separation, but these may induce a revival of separatism in the more left-wing Wallonia."

Resource Control

Besides gaining control over their taxation, regions can gain economically from secession by assuming control of valuable natural resources.

Proponents of Scottish independence argue that their case for economic self-sufficiency is bolstered by the estimated 15-24 billion barrels of oil and gas in the North Sea off the Scottish coast. In fact, Paul Collier and Anke Hoeffler of Oxford University linked the rise of the modern Scottish secession movement to the discovery of that oil in the 1960s. When oil prices rose sharply in the 1970s, the United Kingdom government imposed a tax on most of the increase in oil revenues. The Scottish National Party enjoyed its greatest success up to that point in the 1974 election under the rallying cry "It's Scotland's Oil." Oil also figured prominently in the 2014 referendum, with Scottish nationalists again arguing that revenue from that resource belonged to Scotland and would help ensure its economic success as an independent nation.

But while control over such resources can make the case for independence more enticing, it also raises a number of uncertainties. One problem is that such resources don't last forever. Oil production in the North Sea seems to have peaked in 1999, and it is currently estimated that the oil will last another 30 to 40 years. Scotland's government has argued that it would invest revenue from the oil in a sovereign wealth fund, similar to Norway's oil fund, to provide a revenue stream after the resource is exhausted. Still, it's not clear how soon they would be able to do that. In the 2013 book *Scottish Independence: Weighing Up the Economics*, former Scottish government economist Gavin McCrone noted that current oil revenue would not fully cover the Scottish government's deficit, meaning spending cuts or tax increases would be needed to set aside any revenue in a fund. All of these calculations also depend on oil prices, which are highly volatile. In the run-up to the 2014 referendum, oil prices were more than $100 a barrel; today, they are a little less than half that.

Additionally, while wealthy or resource-rich regions may calculate that they would be better off on their own, there's no guarantee that the parent state will just let them go. And conflict can dramatically increase the costs of separation.

what the center will allow. "Then, either the center makes the road longer or the region decides to leave," he says. On Catalonia's national day in September 2012, hundreds of thousands of people demonstrated in favor of leaving.

The financial crisis also exacerbated regional income differences in Belgium between the wealthy region of Flanders and the less-prosperous Wallonia. The New Flemish Alliance made large electoral gains in the Belgium government last year and has pledged to take steps toward dissolving the current union.

Such disagreements don't always result in secession, though. Buchanan and Faith noted that regions can use

Rebellion and Resistance

Becoming a newly independent nation is rarely a straight-forward process. "Most countries will fight tooth and nail to keep hold of their territory," says James Ker-Lindsay, a senior research fellow at the London School of Economics who studies secession. Orderly referendums like the ones in Quebec and Scotland are more the exception than the rule, he says.

Resistance can usually be expected if the parent country would be made economically worse off by a region leaving, but economics isn't always the motivating factor. Ker-Lindsay notes that when Kosovo unilaterally declared independence from Serbia in 2008, Serbia would have been economically better off letting the territory go. "But even if there are good, rational, economic reasons to divest yourself of a territory, it doesn't always play out that states will sit down and make that rational calculation," he says. States may resist because the seceding region has cultural or historical importance, or because they don't want to set a precedent for allowing further disintegration of their borders.

In either case, when resistance comes in the form of armed conflict, the costs can be devastating. In a 2014 working paper, Rodríguez-Pose and Marko Stermšek of the London School of Economics studied the breakup of Yugoslavia in the 1990s. Unsurprisingly, regions that were able to break away quickly with minimal conflict, such as Slovenia and Macedonia, suffered smaller dips in economic performance than regions that were embroiled in protracted armed conflict, such as Kosovo and Bosnia. And the costs accrue to both sides during a war of secession. For example, in a 1975 paper, Claudia Goldin of Harvard University and Frank Lewis of Queen's University evaluated the costs of the U.S. Civil War by examining, among other things, changes in per capita consumption. According to their estimates, it took the North until 1874 to catch up to its level of per capita consumption in 1860, the year before the war started — and the South did not return to its 1860 level until 1904, nearly four decades after the war's end.

Seceding regions may face opposition from the international community as well. In the 1999 book *The Dynamics of Secession*, Viva Bartkus of the University of Notre Dame noted that the international response to secession can be mixed, as international organizations like the United Nations (U.N.) recognize both the right to self-determination (which favors the seceding entity) and the right to territorial integrity (which favors the parent). On the whole, Bartkus found that international support for territorial integrity is stronger, particularly in cases where the secession is contested. Kosovo, for example, is not recognized by the U.N. as an independent country, despite having the support of key U.N. members like the United States.

In some cases, seceding countries can find themselves cut off from the rest of the world. The Turkish Republic of Northern Cyprus, for example, is a self-declared state recognized only by Turkey. This has greatly limited its ability to

Divided States of America

The United States faced its biggest secession threat during the American Civil War. But there have been cases where states broke away from existing ones while still remaining part of the country. This has only happened successfully four times in America's history, with the creation of Kentucky in 1792, Tennessee in 1796, Maine in 1820, and West Virginia in 1863. There have, however, been hundreds of unsuccessful attempts over the years. Under the Constitution, the division of any state must have the approval of both the state legislature and Congress.

In late 1941, a handful of counties in southern Oregon and Northern California briefly declared themselves the independent state of Jefferson. The movement died out following the attack on Pearl Harbor little more than a week later, but it has enjoyed periodic revivals since then. California, the most populous and third-largest state, has been the subject of hundreds of proposals to break it into multiple states since it first joined the union in 1850. Most recently, venture capitalist Timothy Draper launched a campaign in 2014 to divide it into six states.

And similar movements have occurred at the city level too. In 1969, Norman Mailer campaigned for mayor of New York City on a platform of making the city the 51st state. Residents of San Fernando Valley in the city of Los Angeles failed to secure the votes in a 2001 referendum to secede and form their own city.

The driving forces behind these movements are often similar to the ones that motivate secession at the country level. Disaffected residents argue that their tax dollars are misspent or that local or state governments are not responsive to their needs. Differences in culture also play a major role. But these movements face many of the same challenges as country-level secessions. For example, the recent proposal to split California into six states raised questions about how public debt and services would be apportioned. Water is currently distributed across the state; splitting the state into six pieces would create the challenge of somehow dividing that infrastructure across new state lines. Economic disparities between different regions could be exacerbated as well. Critics of Draper's California proposal contended that it would have created both some of the wealthiest and some of the poorest states in America.

Proponents of splitting states or cities do avoid some of the headaches involved in splitting countries, though. The new entities would retain the same currency, language, and national laws, which would likely make trade between newly split states somewhat easier than between newly separated countries. But given that partitioning states requires both local and congressional support to succeed, it is likely to occur as infrequently as national secessions.

— TIM SABLIK

trade with other countries, and it relies heavily on Turkey for economic support.

For secession to have the best chance of success, it takes consent on both sides. "And that very rarely happens," says Ker-Lindsay. Although the United Kingdom agreed to allow a vote on Scottish secession, Spain has thus far ruled any similar referendum in Catalonia unconstitutional. The separation of Czechoslovakia in 1993 is often held up as the best example of consent. Called the "Velvet Divorce," the secession was handled quickly and peacefully. But it's unclear what lessons from that event apply to today's movements. It was decided by leading politicians on both sides rather than popular referendum, which made it easier to reach agreement.

Separation Anxiety

Even when countries agree to part ways, there are still a number of difficult questions to resolve. How will the debt be split between the seceding entity and the parent? How will public assets like roads, communications infrastructure, or military facilities be divided? What monetary system will the seceding country follow? Will the parent allow it to keep the same currency or will it have to establish its own?

Negotiating the answers to these questions takes time, and that adds to the costs of secession in the form of uncertainty. In a 2013 paper, Robert Young of the University of Western Ontario noted that uncertainty is both the most important transition cost in secession and the hardest to predict. Without knowing how debt will be apportioned or what the monetary regime of the new state will be, businesses and individuals can't make contracts for the future. If the seceding state's participation in international organizations like the European Union is in doubt, then businesses and foreign investors might choose to pull out of the country.

"The size of these transition costs is a political question," says Young. Many of these issues could be resolved ahead of time to reduce uncertainty, Young explains, but opponents of separation have an incentive to maintain uncertainty in order to bolster their cause. In Quebec, he says, opponents argued that secession meant "taking a great big leap into the unknown." Similar arguments were made by opponents of Scottish secession.

And secession votes can raise uncertainty costs even when they are not successful. Quebec's 1995 referendum to secede from Canada failed by a margin of less than 55,000 votes. The wake of that close decision left the specter of future votes, imposing costs on capital in the region. In a 2005 paper in the *Journal of International Financial Management and Accounting*, Roger Graham of Oregon State University and Cameron and Janet Morrill of the University of Manitoba found that Quebec firms were undervalued relative to other firms in Canada, in part due to uncertainty of future independence votes. Others have also attributed the loss of several business headquarters in Quebec over the last two decades to this uncertainty.

"The point I always make to those advocating independence is: You are gambling your savings on a lottery," says Ubide.

Hitting the Jackpot?

Given the potential transition costs, regions need to be relatively sure they will see a return to independence, says Young. "If the transition costs are high, it can take you an awfully long time to make up the losses from the transition period," he says. "If you take a loss of say 5 to 10 percent of GDP for a few years, you had better get a very serious accelerated growth path to make it up."

Do seceding countries enjoy faster economic growth once untethered from the weight of their parents? There is limited evidence, in large part due to the rarity of these events. But according to the 2014 study by Rodríguez-Pose and Stermšek, there doesn't appear to be an "independence dividend." Even when regions in the former Yugoslavia were able to transition to independence fairly quickly and amicably, the authors found that those countries largely continued along the same growth path they had before becoming independent. Moreover, they still suffered significant economic losses immediately following their independence.

Likewise, it is unclear that downsizing necessarily boosts growth chances. In a 2006 National Bureau of Economic Research working paper, Andrew Rose of the University of California, Berkeley studied a panel of more than 200 countries over 40 years. He found no strong evidence of size affecting economic well-being. And while there are plenty of examples of successful small countries, such as Luxembourg, Norway, and Singapore, many economists argue that institutions matter more than size.

"It all depends," says Ubide, "on what you do with your economy once you are out."   **EF**

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The Crop Insurance Boom

A long-standing U.S. farm support program now covers almost every crop — but it attracts more and more critics as well

BY HELEN FESSENDEN

Since he began planting cotton in the 1970s, South Carolina farmer John Hane has invested heavily in irrigation to manage risk. Despite the cost, he considers it the best possible protection against drought as well as a way of ensuring that fertilizer and pesticides are evenly distributed through the soil.

In addition, Hane also buys crop insurance. This federal program, which today covers more than 100 crops, lets farmers purchase policies from insurance companies at a subsidized rate. Cotton is among the many crops it covers, protecting against drops in yield or price, and cotton farmers now have more policies to choose from than before. For Hane, however, some of the new policies are more confusing than the traditional system of direct payments from the federal government, which were phased out for all crops in the 2014 farm bill.

"Irrigation helps a lot, but it's not a total solution," says Hane. "It doesn't protect you from hail or hurricanes. So we need something in addition."

A Success Story?

Under the multiyear farm bill enacted in early 2014, crop insurance is expected to cost taxpayers $41 billion over five years — a jump of almost 20 percent over the previous farm bill, enacted in 2008. Crop-insurance advocates argue it is a far more efficient program to manage an array of risks than ex post disaster relief. It has evolved from an underused program that was plagued by adverse selection in the 1980s to one that covers almost every crop today, with high participation. By 2013, 89 percent of all U.S. farmland was covered by the program, covering more than 290 million acres. In 2012, lawmakers didn't even pass stand-alone disaster aid legislation after a devastating drought because insurers' payouts were comprehensive enough for the crops affected. In the view of its supporters, crop insurance has succeeded as a risk management tool because it covers most farmers, pre-empts the need for ad hoc disaster relief, and effectively substitutes for other, less efficient forms of support.

Critics of crop insurance subsidies, however, point to the fact that the program is still a transfer from taxpayers to farmers and private insurance companies, and as constructed, it is more income support than classic insurance. The government covers about 60 percent of the cost of farmers' insurance premiums as well as 100 percent of administrative and operating costs for insurers, which means farmers can sign up for policies that provide payouts far more generous than reflected by their out-of-pocket cost.

This camp, which includes economists, deficit hawks on and off Capitol Hill, and the nonpartisan Government Accountability Office (GAO), argues there are less expensive ways for the government to help farmers protect themselves against extreme or unanticipated losses, and that private insurers do not need taxpayer assistance regardless. And some economists say that these subsidies have a distortionary effect. For example, they may reduce farmers' incentive to manage risk through other means, such as crop storage or prudent fertilizer and pesticide use; subsidies also may encourage planting in high-risk regions and on marginal land.

"The paradox is that crop insurance may be intended as risk management for farmers, but it actually encourages more risk-taking," said Vincent Smith, agricultural economist at Montana State University. "It's a transfer of risk away from the insurance firms and the farmers."

One of the program's most controversial aspects is the policy design. For most crops, farmers have an array of plans to choose from, but the most dominant is an option called revenue protection. Under one of the most popular revenue-protection plans, a farmer can purchase a policy to insure yield losses or revenue losses on certain crops, but he bases that coverage on the highest price of the season. If a low yield drives up the price of a crop from spring to harvest, the farmer is indemnified for lower yields at the higher harvest-time price; if the price falls over the course of the season due to overproduction, the farmer may use the higher springtime baseline when calculating compensation. Either way, this option

Corn withers during a drought in Texas in 2013.

maximizes the payout from the insurer. Revenue protection contrasts with yield protection, in which a farmer is protected against harvest-time losses in yield, say, in the case of drought; those payouts are pegged to the price projected at springtime. In 2014, about 75 percent of policies were revenue protection, compared with only 13 percent that were yield protection.

The effect of crop insurance on farmers' behavior and the agricultural economy is hard to quantify, because until recently, crop insurance has always co-existed with other farm programs with potentially distortionary effects of their own. Even in the most recent farm bill, which eliminated or overhauled other traditional forms of support, lawmakers still channeled $24 billion in aid over five years to commodity programs. Some economists, however, say evidence suggests that subsidies reduce farmers' willingness to manage risk more efficiently. And more broadly, the program's growing cost has prompted calls to cut the price tag through such measures as trimming payments to high-income farmers or scrapping the revenue-protection option.

Swapping Safety Nets

Farmers of most major crops have received government aid since the Great Depression. These programs have often consisted of price supports, production controls, and ad hoc disaster relief. Insurance has also been available for many crops for years, but a long-standing challenge was finding ways to encourage farmers to sign up for policies. Even after the government began subsidizing premiums in 1980, covering 30 percent of the cost, participation in the program rose only modestly, from 16 percent to 25 percent of eligible acreage. Accordingly, the crop insurance industry was challenged by adverse selection, as most policies were bought by at-risk farmers rather than a broad pool. With too few farmers paying in, the premiums that were paid to insurers often failed to cover the payouts to farmers, even with government subsidies.

All the while, Congress kept passing disaster relief legislation on an as-needed basis, which became frequent. For example, between 1987 and 1994, more than 60 percent of all farms got disaster aid at least once, with some getting it every year. These trends, taken together, bolstered the argument that farmers needed more incentives to buy crop insurance: Ad hoc disaster relief was expensive and unpredictable, but farmers viewed insurance premiums as too pricey.

"The challenge was whether we offer ex ante protection through insurance or ex post protection through disaster relief," said Keith Coble, agricultural economist at Mississippi State University. "Over the years, a consensus grew that ex ante is more efficient, because that way, farmers go into the growing season knowing what coverage they'll have."

New legislation in 1994 offered farmers subsidized catastrophic risk protection as well as the option to "buy up" coverage beyond that. But it was not until 2000, after more rounds of disaster relief, that the government ramped up the premium subsidy and equalized its support for both yield- and revenue-protection policies. Participation took off: Enrollment jumped from 182 million acres in 1998 to 265 million in 2011. The higher participation rate, in turn, has largely eliminated the problem of adverse selection. Still, Congress passed a series of disaster relief bills, totaling around $10 billion from fiscal 2001-2009, to cover losses, especially for under-insured, high-risk regions.

Outside of crop insurance, another change was underway: In 1996, many traditional support programs, which were based on historical price averages, were abolished and replaced with direct payments. These were not based on annual income, prices, or output; rather, they were automatic transfer payments intended to temporarily help transition farmers to a more market-based system. Still, Congress kept on reauthorizing direct payments, effectively converting them into long-term support. By 2011, direct payments averaged $5 billion annually. These transfers came under increasing fire because the program allowed much of the money to go to wealthy farmers, as well as to farmers who did not plant the covered crop in that crop year.

The most recent farm bill, passed in early 2014 as a five-year authorization, eliminated direct payments and some other forms of support while increasing the budget for crop insurance subsidies and bringing more specialty crops (like fruits and nuts) under its purview. It also added a program called STAX specifically for cotton, offering a subsidy based on county prices to help cover a farmer's deductible on top of existing subsidies for premiums. This measure was intended to entice more U.S. cotton growers to ramp up insurance coverage, in conjunction with a WTO settlement that ordered the United States to dismantle long-running cotton price supports and export subsidies after a successful lawsuit by Brazil.

Risk Management or Income Support?

A farmer has to make two basic decisions when signing up for a policy: how much of the crop to cover, and which type of plan to select. Crop coverage is offered in 5 percent increments; farmers usually choose to cover 65 to 80 percent of

their crop. Many crops also have supplemental coverage options that help cover the deductible, which can bring effective coverage to as high as 90 percent.

Premiums are determined by the U.S. Department of Agriculture (USDA) Risk Management Agency and vary considerably, depending on the crop price and an array of risk factors. But the subsidy percentage rates are determined by legislation, and those have risen from an average of 37 percent in 2000 to 62 percent by 2013. Accordingly, the higher the premium is, the higher the dollar amount of the subsidy. And if commodity prices rise — as they have done for the most part in the past decade — the premium goes up as well, because the crop's insured value has grown.

The design and popularity of revenue protection explains much of the increase in crop insurance costs to the government: It offers the most generous payouts but does not require a commensurate hike in premiums compared to other policies. To critics, the revenue protection guarantee makes it easier for farmers to break even or make a profit on high-risk or marginal land that otherwise would not be worth the investment.

Blueberry Pricing and Other Puzzles

Some economists believe revenue protection crowds out other ways to hedge against price risk, such as futures contracts.

"The question is this: Why should we have revenue insurance when we already have futures markets that try to reduce price risk?" asked Mississippi State's Coble. "A lot of commodities already have mechanisms out there to protect against price risk, so revenue protection may be redundant. But with smaller crops, you can't really hedge against price risk. There is no consensus on what blueberries in New England will bring at harvest time."

More broadly, the linkage between crop insurance and planting patterns was examined in a recent report by the GAO, which looked at premium rates by county for the top five crops — corn, soybeans, wheat, cotton, and grain sorghum — from 1994 to 2013. Together, these crops accounted for 86 percent of all premiums in 2013.

The GAO found that the premiums set by the government ranged a great deal depending on the fragility of the land; some regions, such as the Texas high plains and the Dakotas, stood out in this respect. Furthermore, over 20 years, farmers in high-risk regions got back far more in payouts than those in less risky counties: $1.97 back in net gains for each dollar premium dollar they paid in, versus 87 cents per dollar for the rest. The GAO report concluded that the government spends far more insuring high-risk regions than it does elsewhere, by up to a factor of three, and it called on the USDA to use its authority to adjust premiums to account for this differential.

Two Policies, Two Payouts

In 2012, when a severe drought struck the Midwest, corn yields fell while the price rose. In Iowa, the price rose from $5.68/bushel in the spring to $7.50/bushel by harvest time. Here is a comparison between what a farmer would have received under a yield protection policy that covered 80 percent of his crop and what he would have received with an 80 percent revenue protection policy. In this example, his yield fell from 172 to 130 bushels per acre.

The farmer's premium is the same for both policies, but he gets a payout that is $13.83 more per bushel under revenue protection.

Yield Protection
Policy covers 80 percent of 172 bushels (projected yield) = 137.6 bushels Payout equals insured yield minus harvest-time yield — 7.6 bushels – times the *springtime price* of $5.68: **$43.17/bushel**
Revenue Protection
Policy covers 80 percent of 172 bushels (projected yield) = 137.6 bushels Payout equals insured yield minus harvest-time yield — 7.6 bushels – times the *harvest price* of $7.50: **$57.00/bushel**

SOURCE: U.S. Department of Agriculture, Risk Management Agency

Another question among economists is whether crop insurance subsidies affect farmers' behavior in different ways than older support programs did. The challenge is that crop insurance subsidies have always co-existed with other farm support, making it difficult to isolate their particular impact. And all of these programs, taken together, have changed over the decades.

Some economists also point out that agricultural data — in contrast to, say, data for auto insurance policies — is highly lagged. It takes years to gather due to the need to capture different weather events. For those reasons, the crop insurance program may buy time to gather information over decades that, at some point, can design policies that are more accurate.

Other economists, however, say the evidence is more clear-cut. In a widely cited 1996 article, Montana State's Smith and North Carolina State University economist Barry Goodwin published research suggesting that crop insurance was linked to decisions on risk-mitigating inputs such as fertilizer and pesticides. Using a sample of Kansas wheat farmers, they concluded that farmers made decisions on insurance and inputs jointly, and that the insurance coverage was inversely related to input use. Everything else being equal, insured farmers spent $4.23 less per acre on fertilizer than their uninsured counterparts.

Their broader conclusion still holds up today, says Smith.

"Farmers will do less to manage their production losses if the crop is insured, and will adopt more risky management techniques, like using less pesticide and fertilizer," Smith adds. "They're also likely to shift production to marginal land. This isn't a massive movement, but it's still movement."

This is, in short, a question of moral hazard: whether crop insurance makes farmers more inclined to adopt risky practices because they will not have to pay for the

downside. Economist Bruce Babcock, who led a study by the Environmental Working Group critical of the program, argues it can affect where a farmer choses to plant, especially fragile and marginal land.

"If a farmer has to decide whether it's risky to plant on particular ground, crop insurance makes planting slightly more likely," says Babcock.

To him, the more clear-cut argument is that the current crop insurance regime "crowds out" other forms of risk management that would be cheaper to the taxpayer, including futures contracts as well as more traditional techniques.

"If they were really looking to manage risk, farmers could use off-farm income, diversification of crops, storage, and other macro risk-management tools that are more efficient," he said. "But we have to remember they don't buy insurance for risk management benefits alone. They buy it because the subsidies make it worthwhile."

In Smith's view, if subsidies were cut, farmers would invest more in traditional risk-management techniques rather than pay the market price for most costly, unsubsidized insurance premiums.

"If farmers had to pay commercial rates for insurance, most would be priced out because the insurers would pass along the considerable administrative and operating costs to the customers," he says. "It's more likely they would go back to older, cheaper ways of risk management, like crop diversification, better input use, storage, and so on. This is what we saw in the 1970s and 1980s."

The crop insurance program's growing cost has spurred new reform proposals since the farm bill. President Barack Obama's most recent budget called for cutting $16 billion over 10 years by trimming subsidies for revenue protection, among other measures. A recent bipartisan Senate proposal would also trim payout costs, while another would set a cap on subsidies to $50,000 per recipient, saving more than $2 billion over 10 years. (Crop insurance currently has no caps on payments.) The challenge, however, is that farm bills are typically written only once every five years or so. The process has become more difficult in recent rounds, and what was once a bipartisan exercise has become a heavy lift. The last farm bill, in fact, took two years to complete.

The Cotton Case

Cotton is an unusual case for a U.S. commodity in that it has been affected by international trade litigation. The changes that South Carolina farmers like John Hane are adjusting to stem from a long-running dispute between the United States and Brazil. In 2004, Brazil charged that U.S. cotton price supports and export credit guarantees contravened World Trade Organization rules by keeping U.S. cotton acreage artificially high. The WTO ruled in Brazil's favor, forcing farm bill negotiators to find a way to make cotton compliant, and the case was finally settled in October 2014. Expanding crop insurance plans to growers was viewed as the easiest workaround once it was clear that cotton would lose its commodity-program support, and STAX was introduced in its stead.

Cotton, which is primarily an export commodity in the United States, is far less dominant in South Carolina than it used to be, but it remains among the top five crops. In 2012, the state's cotton sales totaled around $214 million, or around 7 percent of the agricultural economy. That share may well decline, however, as farmers face a global cotton glut, amid rising production and stock-piling abroad, and a resulting decline in prices. Cotton now fetches around $0.63 per pound, down from $0.94 per pound in 2012. Lower prices have coincided with the end of direct payments — seen as more generous than crop insurance — to make for a bumpy transition.

Moreover, cotton is more labor intensive than other crops, so it is seen as more expensive to insure. For years, growers were less inclined to buy insurance as long as they had other forms of assistance. Now that the older programs are gone, revenue protection policies are gaining popularity with the state's cotton growers, while STAX has had fewer sign-ups because most farmers see it as too confusing, according to Charles Davis, an agricultural adviser affiliated with South Carolina's Clemson University Extension Service.

Davis says he tells farmers that crop insurance is only one risk-management tool to consider, especially when compared to irrigation.

"In my county, Calhoun, we're highly irrigated, and we've taken the money made during good years and put it into long-term investments like irrigation to give us a high degree of security," he says. "Crop insurance can't do that. It helps cover your production costs and lets you survive another day, but it doesn't do much beyond that."

Davis adds that he has a standard response to farmers who tell him they are unhappy with the switch to crop insurance away from direct payments.

"This is still a benefit you paid for with your taxes," he says. "So quit complaining. You could have had no direct payments *and* no crop insurance subsidy."   **EF**

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Marriage on the Outs?

The institution of marriage is solid — but only for certain groups. Economics helps explain why

BY JESSIE ROMERO

You wouldn't know it from watching the wedding-dress shows on TV or browsing the celebrity-wedding headlines in the checkout aisle, but for years, marriage has been on the wane in the United States. Only 53 percent of adults were married in 2012, according to the Census Bureau, compared with 68 percent of adults in 1960.

In part, that's because people are waiting longer to get married than they did a generation ago. The median age of first marriage has increased by more than six years since 1960 for both men and women, to 29 and 27, respectively. But it's also because fewer people are choosing to get (or stay) married — a reflection of tremendous cultural and technological changes during the past five decades.

The decline in marriage is far from uniform, however; marriage and divorce rates vary significantly across socioeconomic lines. Given the large body of research that purports to show married people and their children are happier, healthier, and wealthier, many policymakers and researchers are concerned about the long-term consequences of changes in marriage. But the evidence in favor of marriage is far from conclusive, so it remains a hotly debated question: Does marriage matter?

Love, Economist-Style

To an economist (at least from a professional point of view), marriage isn't just about love. Instead, it's a decision that can be analyzed like any other economic decision: People get married when the net benefits outweigh the net benefits of being single. In his influential 1981 book, *Treatise on the Family*, Nobel laureate Gary Becker, an economist at the University of Chicago until his death in 2014, described the household as a small firm in which workers specialized in different tasks. In particular, because of their natural and historical comparative advantages in childbearing and rearing, women specialized in the domestic sphere and men specialized in the market sphere. In this framework, men and women formed households because they could produce more together than they could apart. Marriage was a contract that assured men their children and home would be cared for and that protected women who had forgone the opportunity to gain the skills needed to succeed in the market sphere when they opted for home life.

Beginning in the 1950s and 1960s, new technologies and changing cultural norms dramatically altered the calculation for people considering marriage. New devices such as dishwashers and washing machines and the increasing availability of goods and services for purchase — both domestically and from abroad — dramatically lowered the time and skill required to manage a household. "This reduces the importance of having domestic household specialists," says Justin Wolfers, a senior fellow at the Peterson Institute for International Economics and a professor at the University of Michigan. "My grandmother used to make clothes for my mother. My family also has a seamstress — it's someone who lives in China."

Other changes included the advent of reliable, female-controlled birth control in the form of the pill and the legalization of abortion, which lowered the cost — choosing between abstinence or the risk of having a child out of wedlock — of remaining single. With greater control over childbearing, women began increasing their educational investments and delaying marriage, contributing to a dramatic rise in women working. Between 1950 and 1990, women's labor force participation rate increased from 37 percent to 74 percent.

Shifting cultural norms also altered the calculation. "Think about the words we used to use," says Isabel Sawhill, a senior fellow in economic studies at the Brookings Institution. "Cohabitation was called 'living in sin.' Children born outside of marriage were called 'illegitimate.' All of that's changed. There's much less social pressure to marry." In addition, U.S. Supreme Court rulings in the late 1960s and early 1970s granted constitutional protections to children born out of wedlock, including overturning state laws that denied "illegitimate" children the right to paternal support, thus reducing the social and economic costs of single parenting.

The Retreat from Marriage

These changes have resulted in what many social scientists have deemed a "retreat from marriage." The marriage rate peaked just after World War II, when there were 16.4 marriages per 1,000 people, plateaued at around 10 marriages per 1,000 people during the 1970s and 1980s, and has declined steadily since then. In 2012, there were 6.8 marriages per 1,000 people, according to the most recent data available from the National Center for Health Statistics (NCHS).

The NCHS data do not yet include same-sex marriages, but the Census Bureau started publishing data on same-sex marriages in 2005 (and in 2013 began counting them in its overall marriage statistics rather than grouping them with cohabiting couples). Same-sex marriages currently are a small share of all marriages, and it's unclear how the nationwide legalization of same-sex marriage in June 2015 will affect long-term trends. In 2013, there were between 170,000 and 252,000 same-sex married couples, compared with about 56 million opposite-sex married couples. In the short-term, some estimate the number of same-sex marriages could increase to 500,000.

While opposite-sex marriage has decreased, cohabitation — living with an unmarried romantic partner — has increased. In 1995, cohabiting rather than marriage was the first union for 34 percent of women, according to the National Survey of Family Growth. During the 2006-2010 wave of the survey, cohabiting was the first union for 48 percent of women. For many of the couples in the 2006-2010 survey, living together was a precursor to marriage; 40 percent of cohabiting couples had gotten married within three years. But another 32 percent were still living together without getting married. (The remainder had broken up.)

Fewer and later marriages have coincided with a growing share of children born to single mothers. In 1970, about 15 percent of first births were to unmarried women. By 2011, nearly 50 percent of first births were to unmarried women, according to a report by the National Campaign to Prevent Teen and Unplanned Pregnancy, the Relate Institute, and the National Marriage Project at the University of Virginia.

The cultural and economic changes of the 1960s and 1970s also contributed to a large spike in divorce rates. Between 1960 and 1980, the number of divorces per 1,000 married couples more than doubled, from fewer than 10 to more than 20, according to research by Wolfers and Betsey Stevenson, also an economist at the University of Michigan. (Stevenson and Wolfers have been partners for nearly two decades and have children together, but they are not legally married.) Nearly 50 percent of all new marriages between 1970 and 1979 ended in divorce within 25 years. "As women's earnings went up, they were able to set the bar higher because they weren't dependent on marriage for their economic well-being," says Sawhill. "They opted out of marriages that might have been contracted in an era when women had fewer rights and opportunities."

But the divorce rate has steadily declined since the early 1980s, to about 17 new divorces per 1,000 married couples.

That's still higher than during the 1950s, but it is now in line with historical trends, according to Stevenson and Wolfers. That could be because the same changes that initially contributed to more divorces and fewer marriages also prevented a number of "bad" marriage matches that would likely have ended in divorce.

The Marriage Gap

The overall trends in marriage, divorce, and childbearing mask significant differences among socioeconomic groups, particularly between the more and less educated. Historically, people without a college degree have been more likely than the college educated to marry, but since World War II the gap has closed, although the patterns differ by gender.

For much of the 20th century, college-educated white women were much less likely to get married than white women with less education. But between 1950 and 1980, the marriage rate for college-educated women increased significantly, according to research by Stevenson and Adam Isen of the U.S. Treasury. Marriage rates for both groups began to decline after 1980, but the decline was larger for less-educated women, shrinking the gap between these two groups.

In contrast, a gap has emerged among white men. Historically, men's marriage rates have not differed by education, but starting in 1990 the marriage rate for less-educated men declined much more than the rate for men with a college degree, such that college-educated men are now more likely to marry than those without a degree.

Gaps also have opened up between whites and blacks and between whites and Hispanics. In 1986, 4.8 percent of white, non-Hispanic women aged 55 and older had never been married, according to Census data. Black women were slightly more likely to get married; 3.5 percent had never been married. In 2009, the rate for white women was virtually unchanged, at 4.7 percent. But the number of black women who had never been married by age 55 had increased to 13 percent. Hispanic women also are less likely to marry than white women, although the gap is much smaller (see chart).

Isen and Stevenson's research also suggests that the decline in the divorce rate is concentrated among the college educated. About 37 percent of the marriages of white female college graduates that occurred during the 1970s had ended in divorce 20 years later, compared with 46 percent of marriages for those with some college and 39 percent with a high school education or less. For marriages that occurred during the 1980s, the percent ending in divorce 20 years later had fallen to 31 percent for college graduates but was virtually unchanged for women with less education.

The trend was even more pronounced among white men; the percent of marriages ending in divorce after 20 years fell from 34 percent to 25 percent for the college educated but rose from 39 percent to 44 percent for those with a high school degree or less. Black men and women are more likely than whites to get divorced, but the trends by education are similar. While it's difficult to predict what will happen for

Percent of Women Never Married, 1986 vs. 2009
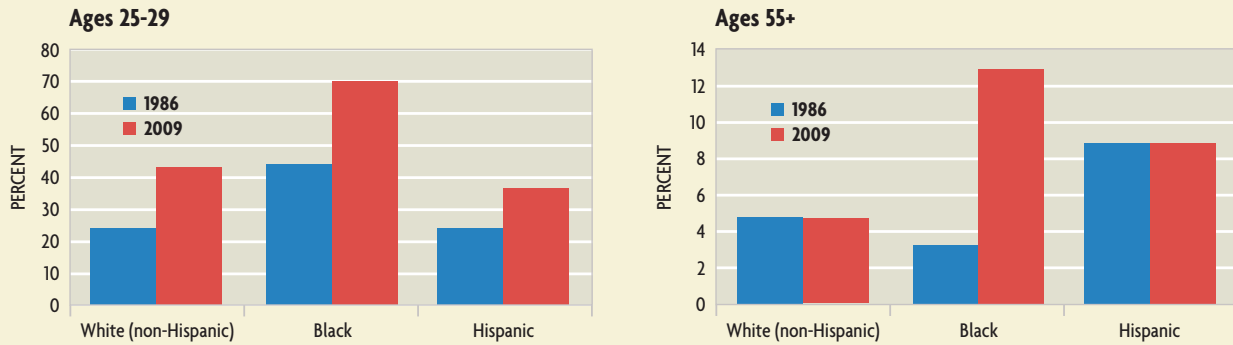
the marriages that occurred during the 1990s, the divorce rates after 10 years suggest the divergence by education will continue.

Differences in cohabitation and non-marital childbearing follow similar lines. Women with a high school diploma or less are significantly more likely to cohabit as a first union than women with a college degree, and it's less likely that their cohabitations transition to marriage. They also have children outside of marriage at much higher rates.

In economic terms, marriage trends reflect an increase in "assortative mating," or people marrying people who are similar to them. That increase could have an effect on the level of income inequality. In a 2014 paper, Jeremy Greenwood of the University of Pennsylvania, Nezih Guner of MOVE (a research institute in Barecelona), Georgi Kocharkov of the University of Konstanz (Germany), and Cezar Santos of the School of Post-Graduate Studies in Economics at the Getulio Vargas Foundation (Brazil) found that if married couples in 2005 were matched following the same patterns observed in 1960, the level of income dispersion would drop by more than one-fifth.

Opposites Don't Attract

What's behind the socioeconomic differences in marriage? Some researchers have pointed to declining economic prospects for less-educated men; between 1980 and 2010, the real wages of men with a high school education or less declined by 24 percent, according to research by Sawhill and Joanna Venator, also with the Brookings Institution. Numerous studies have found a positive correlation between men's economic prospects and marriage rates, so as men's wages decline, women might not consider them valuable partners in a marriage. In recent work, Sawhill and Venator found that declining wages can explain about one-quarter of the decline in marriage rates among less-skilled men. "They don't have good jobs, they don't earn enough, and so the women in their networks are taking a pass," says Sawhill.

In some communities, the issue might not be whether the men are marriage material, but whether there are enough men at all. High incarceration rates for black men have significantly skewed the gender ratio, according to research by Wolfers and David Leonhardt and Kevin Quealy of the *New York Times*. In some areas of the country, there are only 60 black men for every 100 black women not in jail. Nationwide, there are 83 black men for every 100 black women. Among whites, there are 99 men for every 100 women.

Another explanation might be that the changing nature of marriage has made it an institution more valuable to people higher up the socioeconomic ladder. Stevenson and Wolfers have proposed a theory of marriage based on "consumption complementarities" rather than Becker's production complementarities. Over time, families on average have seen an increase in leisure and consumption, and many hobbies and activities are more enjoyable with another person. "In our view, the person you want to marry is the person with whom you share interests and passions. At its most simple, this is a theory of love," says Wolfers. But such "hedonic marriage" might offer more to people at the top end of the distribution. "It's a forum for shared passions, and that works when you have the time, money, and energy for sharing."

When marriage was based on production complementarities, it was more likely that opposites would attract. "Back in our grandparents' day, women with graduate degrees had very low marriage rates. If you were looking for a good homemaker, a wife with a master's wasn't that helpful," says Wolfers. "Today, if you're looking to share income and passions with a soul mate, a highly educated woman is incredibly valuable."

The shift to hedonic marriage might also have made the institution more attractive to same-sex couples. In a 2012 article for *Bloomberg View*, Stevenson and Wolfers noted that same-sex relationships are less likely to involve traditional gender roles and separate spheres, limiting the economic gains from the Becker model of marriage.

A model of marriage based on consumption complementarities doesn't necessarily explain why a couple would choose to get married rather than cohabit, since many of the same benefits could be derived from living together.

In a chapter for the 2014 book *Human Capital in History: The American Record*, Shelly Lundberg of the University of California, Santa Barbara and Robert Pollak of Washington University in St. Louis try to explain how marriage today differs economically from cohabiting. They propose that highly educated men and women use marriage as a commitment device to make large investments in children.

In Becker's model, marriage was a long-term commitment that enabled both parties to make specialized household investments — the wife in caring for the home and children and the husband in providing for the family. Although changes in divorce law have made it less costly to exit marriage, divorce still entails more social, legal, and financial costs than ending a cohabiting relationship. As a result, marriage can still function as a long-term commitment device. But today, according to Lundberg and Pollak, the focus of the investment for both husband and wife is children.

For a variety of reasons, including time and resource constraints, cultural norms, or expectations about what the future is likely to hold for a child, parents with different income and education levels might differ in their willingness and ability to make large investments in their children's human capital. That could affect their willingness to enter into a long-term contract — marriage — to facilitate those investments. For couples with low levels of education, Lundberg and Pollak suggested, "a child's limited prospects for upward mobility combined with falling real resources ... precludes an intensive investment strategy for parents and limits the value of marriage and the commitment it implies." In contrast, couples with more education might view marriage as having a higher payoff for their current or future children.

"There's a strong consensus in economics that much of income inequality is generated by things that happen before people reach the labor market — family, school, neighborhood," says Pollak. "Parents' educational attainment is an important component. So these changes in marriage and childbearing patterns are likely to exacerbate income inequality in the next generation."

Is Marriage Good for You?

Beyond the possible implications for income inequality, a large body of research also contends that married people are both happier and healthier than their never-married or divorced peers. For example, research has shown that married men have lower rates of cardiovascular disease, hypertension, depression, and they have better outcomes after a cancer diagnosis. And many studies have found a positive correlation between marriage and life satisfaction, at least in industrialized countries.

Research on marriage is complicated by "selection effects," however — the possibility that people who get married vary in a systematic way from people who don't. Poverty can be a cause of family disruption, not just an effect, and it's possible that healthy, happy people are more likely to get married in the first place, rather than marriage making them that way. Economists and other researchers can employ a variety of techniques to control for such selection bias, and some have concluded there is in fact a causal relationship between marriage and positive outcomes. But others have found that selection plays a large role. In a 2006 article, Alois Stutzer of the University of Basel and Bruno Frey of Zeppelin University Friedrichshafen (Germany) found that happier people are more likely to get married, and that people who get divorced were already less happy when they were newly married or single.

The mere fact that fewer people are getting married could cast doubt on claims about the benefits. "If marriage is really so great for men and women," Pollak asks, "why aren't more people getting married and staying married? Is it just that they don't realize how great it would be? Economists tend to rely on the notion of 'revealed preference': You learn things about people's preferences from watching what they do, and most economists believe that people are reasonably good judges of what's in their best interest."

Adults might be able to make decisions in their own best interest, but what about their children's? Numerous studies suggest that children who grow up in single-parent families have worse economic and social outcomes — such as growing up in poverty, becoming a teen parent, or getting arrested —than children in two-parent families. Such studies also might suffer from selection bias, however. As Sara McLanahan of Princeton University, Laura Tach of Cornell University, and Daniel Schneider of the University of California, Berkeley noted in a recent article, "Family disruption is not random event and ... the characteristics that cause father absence are likely to affect child well-being through other pathways."

In the article, the researchers reviewed 47 papers that used innovative research designs to control for selection bias. The evidence was mixed regarding the effect of father absence on some outcomes, such as adult income or marital status. But they did find evidence that a father's absence has a causal effect on risky behavior such as smoking or becoming a teen parent, the likelihood of graduating from high school, and adult mental health. Still, the magnitude of the

effect was much smaller than in traditional studies that did not control for selection effects.

But even if there were conclusive evidence that growing up in a two-parent family causes better outcomes than growing up in a single-parent family, it doesn't necessarily follow that those parents have to be married. "It's stability that matters," says Sawhill. "It just happens to be that for historic and cultural and religious reasons, marriage has been the way we have created that stability."

Still, in recent decades, policymakers have made several attempts to encourage marriage. The Personal Responsibility and Work Opportunity Reconciliation Act of 1996, which reformed the welfare system, offered states cash bonuses for increasing the number of two-parent families, and the Deficit Reduction Act of 2005 authorized $150 million per year for five years for states to conduct marriage education programs and advertising campaigns, among other initiatives. Some marriage advocates have proposed altering the tax code or changing the qualifications for means-tested benefits to eliminate the "marriage penalty" many poor people face. But marriage promotion initiatives appear to have little effect on marriage or divorce rates, and research suggests the effects of tax and benefit changes are likely to be small.

Whether or not it's possible to encourage people to marry, the larger question is whether policy *should* encourage people to marry. Studies that link marriage to positive health and economic outcomes compare the average unmarried person to the average married person. But the more relevant comparison, as Stevenson and Wolfers have noted in their research, would be to someone in the marginal marriage created by policy. "If you ask the question, would someone be happier if they were married, you also have to ask, married to whom?" says Pollak.

The divergence in marriage and divorce rates among socioeconomic groups raises important questions about the long-term consequences for children and the perpetuation of advantage from one generation to the next. But economic, cultural, and technological changes make it seem unlikely, at the moment, that the overall retreat from marriage is going to reverse. What is certain is that the institution will continue to evolve.   **EF**

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Campbell Harvey

Finance has surely existed in one form or another since the earliest days of civilization. But finance as we know it, as a mathematical subfield of economics, is relatively young; many date its genesis to 1952, when economist Harry Markowitz published an article on the use of modern statistical methods to analyze investment portfolios. Today, the discipline seems as ubiquitous as the financial services sector itself, which grew from 2.8 percent of U.S. GDP in 1950 to a pre-recession peak of 8.3 percent of GDP in 2006.

Among the leading thinkers in academic finance is Duke University's Campbell Harvey. As a doctoral student at the University of Chicago in the 1980s, he turned out to be at the right place at the right time: Half of his dissertation committee was made up of future Nobel laureates — Eugene Fama, Lars Hansen, and Merton Miller. In the years since, his research interests have spanned such topics as the modeling of risk, the yield curve as a source of information about expectations of economic growth, equity and bond returns in emerging economies, and changes in the risk premium in financial markets. He has long been interested in bitcoin, a type of digital currency; this interest led him to offer a class at Duke this spring on creating new ventures based on bitcoin technology.

In addition to his appointment at Duke's Fuqua School of Business, Harvey is a research associate of the National Bureau of Economic Research. He has been a visiting professor at the Stockholm School of Economics and the Helsinki School of Economics and a visiting scholar at the Fed's Board of Governors. He is president-elect of the American Finance Association and a former editor of the *Journal of Finance*. He is also the investment strategy advisor to Man Group, one of the world's largest hedge funds. David A. Price interviewed Harvey at his office at Duke in April 2015.

◆

EF: How did you become interested in economics in general and finance in particular?

Harvey: In a summer internship during business school, I was working on a fascinating problem for a company that, at the time, was the largest copper mining company in the world. The price of copper correlates closely with the economy. They wanted me to figure out if there was a better way to forecast what was going to happen in the economy than

what was commercially available. I had an idea that turned out to be, I guess, a pretty good idea; I was using information in financial instruments — in particular, the term structure of interest rates — to extract information about what people in the market at least think is going to happen in the economy. That really got me interested. After that point, I had the research bug, so to speak, and I never looked back.

EF: Financial economists, of course, have a large practitioner community in addition to those in academia. How do the incentives of finance economists in the private sector differ from those of academics, and how does this affect how they approach their work?

Harvey: There's a lot of similarity in that you are interested in discovering something. To be published in academic finance or economics, the idea must be unique; it's the same in the practice of finance — you're looking to do something that your competitors haven't thought of.

There are differences, though. The actual problems that are worked on by practitioners are more applied than the general problems we work on in financial economics.

The second difference is that in academic financial economics, you have the luxury of presenting your paper to colleagues from all over the world. You get feedback, which is really useful. And then you send it in for review and you get even more feedback. In business, it's different; you cannot share trade secrets. You really have to lean on your company colleagues for feedback.

The third thing that's different is access to data for empirical finance. When I was a doctoral student, academia had the best data. For years after that, the pioneering academic research in empirical finance relied on having

this leading-edge data. That is no longer the case. The best data available today is unaffordable for any academic institution. It is incredibly expensive and that's a serious limitation in terms of what we can do in our research. Sometimes you see collaborations with companies that allow the academic researchers to access to data that they can't afford to buy. Of course, this induces other issues such as conflicts of interest.

The fourth difference is the assistance that's available. Somebody in academia might work on a paper for months with a research assistant who might be able to offer five to 10 hours per week. In the practice of management, you give the task to a junior researcher and he or she will work around the clock until the task is completed. What takes months in academic research could be just a few days.

The fifth difference is computing power. Academics once had the best computing power. We have access to supercomputing arrays, but those resources are difficult to access. In the practice of management, companies have massive computer power available at their fingertips. For certain types of studies, those using higher frequency data, companies have a considerable advantage.

EF: You've argued that more than half of the papers published in empirical finance are probably false because they have a mistake in common. Can you explain what that mistake is?

Harvey: It's a mistake that is made in the application of statistics. Think of testing for an effect. You try to see if there is a significant correlation between what you're trying to explain, let's call it Y, and the candidate variable, X. If you do that, we have well-established procedures and statistics; we look for a correlation that is a couple of standard deviations from zero — the so-called two-sigma rule, or 95 percent confidence level.

But suppose we tried 20 different versions of X, 20 different things, to try to explain Y. Then suppose that one of them, just one, satisfied this rule where the correlation is two standard deviations from zero. It's possible that this one "worked" purely by chance. That two-sigma rule is valid only for a single test, meaning there is one Y and one X. As soon as you go to one Y and 20 X's, then you need to change the rules because something is going to appear significant by luck. And when you go to even more than 20, there is almost a 100 percent probability something is going to show up by a fluke.

It turns out — and this is not just in empirical finance, it's also in economics more generally — that if you just open almost any scientific journal, and if there is an empirical paper, you will see a table with different variables tried. That is what we call multiple testing. With multiple testing, the standard sorts of cutoffs are not appropriate. So this has a wide ranging application in terms of how we do research in economics.

> What's really interesting is that other stuff can be done with bitcoin technology that is almost completely under the radar screen.

In medicine, there is a famous study that concluded that over half of the medical research that was published was likely false. The conclusion in economics is no different than in medicine; it's the same idea, that people do not properly account for multiple testing.

My paper tries to go beyond previous findings in other fields like medicine. I develop a framework to check for tests that we do not observe. A person says that X explains Y and is significant — well, what happens if that person tried 20 things but just didn't report it? My research also incorporates something that is important in finance — the tests can be correlated. In my example, with the 20 different X variables, it makes a big difference if the Xs are correlated or uncorrelated.

You might think that people might be upset at me for doing something like this, but that is not the reaction I have experienced. I think it helps that I made the mistake, too. I'm on the list of people who failed to properly account for multiple tests, so some of the things that I thought I had discovered in the past are below the bar. I'm pointing a finger at myself, also.

EF: You've written extensively about bitcoin and other so-called crypto currencies. How do you think their role will evolve and does the rest of the payments industry have anything to be worried about?

Harvey: This is a significant innovation that is poorly understood by the general public and poorly understood by the companies that are about to be disrupted. It is a method that makes transactions more efficient. When you swipe your credit card at the gas pump, most people don't realize that the credit card fee is 7 percent. It's very inefficient when you are faced with transaction fees like that. The lowest-hanging fruit that is going to be disrupted is money transfer done by companies like Western Union, where it's routine to charge 10 percent or more on a transfer. A similar transfer fee in bitcoin is about 0.05 percent. The worldwide money transfer market is $500 billion per year and potentially $50 billion a year can be saved. In a broader sense, bitcoin is not just about money transfers — it establishes a new way to exchange property.

The foundation of bitcoin the currency is the technology behind it, called the block chain. This is a ledger containing the transaction record of every bitcoin over the history of bitcoin. It is a ledger that is available to anybody who is on the network. It is fully transparent. The advantage is that if I go pay for something with a bitcoin, then the vendor checks this historical transaction record to see if I actually have the coin to pay. So there is no counterfeiting, there is no double-spending, there is no bouncing of a check. On top of that, this ledger is protected by cryptographic barriers generated by historically unprecedented computing power.

This technology is offside to the run-of-the-mill hacker because the entrance fee is about $500 million of hardware — and even with that, you cannot change the historical transaction records. So it is not going to be hacked. It's secure. There's plenty of talk about bitcoin being stolen and things like that, but that is all the result of incompetent third parties. It has nothing to do with the actual technology behind bitcoin.

With bitcoin, you also don't need to worry about your private information being hacked. In usual transactions, we routinely give up private information such as bank account numbers, debit cards, or even Social Security numbers. Of course, vendors accepting bitcoin might actually require some private information to verify your identity, which is fine. But bitcoin's much more secure.

And that's just the tip of the iceberg. What's really interesting is that there is other stuff that can be done with this technology that is almost completely under the radar screen. For example, in this ledger, you could also put what we call conditional contracts: very simple contracts like stocks, bonds, options, forwards, futures, or swaps. So it provides a different way to exchange at very low transaction fees and it is very fast.

EF: Apart from the potential just for disruption, these currencies seem to generate strong reactions, pro and con. Why is that?

Harvey: It's hard to think about the value of bitcoin because it isn't backed by anything, so it is only valuable if people believe it's valuable. Now that is also true with fiat currency. But the U.S. dollar, a fiat currency, is legal tender in the United States, which means you are obligated by law to accept dollars for payment. The government enforces taxation and can incarcerate you if you fail to pay your taxes. So there is more to the dollar than "it has value because people believe it has value."

On top of that, if you look at the currency of the United States and another country, the so-called foreign exchange rate, people are generally comfortable thinking about movements in those currencies in terms of the monetary policies and economic growth of the two countries. You put those together and you get an idea of what is driving variation in the exchange rate. With bitcoin, it's not so simple because there are no economic fundamentals. It is a world currency, so it is not tied to any particular country. The only monetary

Campbell Harvey

➤ **Present Positions**
J. Paul Sticht Professor of International Business, Fuqua School of Business, Duke University
Research Associate, National Bureau of Economic Research

➤ **Education**
Ph.D. (1986), University of Chicago
M.B.A. (1983), York University
B.A. (1981), Trinity College, University of Toronto

➤ **Selected Publications**
"... and the Cross-Section of Expected Returns," NBER Working Paper, October 2014 (with Yan Liu and Heqing Zhu); "Managerial Attitudes and Corporate Actions," *Journal of Financial Economics*, 2013 (with John Graham and Manju Puri); "The Theory and Practice of Corporate Finance: Evidence From the Field," *Journal of Financial Economics*, 2001 (with John Graham); numerous other articles in such journals as the *Journal of Finance, Journal of Political Economy*, and *Quarterly Journal of Economics*.

policy is an algorithm that says that bitcoins will be created at a decreasing rate and cap out at 21 million in about 2140. So it is much more difficult to think of the fundamentals behind bitcoin.

I think all this leads to considerable volatility in terms of the value of bitcoin. But there is a way to do transactions that bypasses the volatility issue. Given that there is a fully regulated exchange in the United States for bitcoin, I can have a wallet with U.S. dollars in it, and when I need to transact in bitcoin, I can move some dollars into bitcoin, I buy what I need to buy, the vendor accepts the bitcoin and immediately translates it back into U.S. dollars. All you see is a U.S. dollar price on both sides. Indeed, in the software, you see the pricing in U.S. dollars, you hit send, and the vendor gets what was promised in U.S. dollars.

So the volatility doesn't bite you for transacting, but it does bite you in terms of the store of value. Right now, bitcoin is not a reliable store of value because it is too volatile. Volatility will likely decrease when the market is more liquid and when bitcoin is better understood by the general public, but right now the people who hold bitcoin are mostly speculators. Given that it is eight times more volatile than the S&P 500, it is hard to recommend as a store of value at this point. Nevertheless, I believe this technology has considerable promise.

What will happen in the future will be something digital. Whether it's the bitcoin model, I'm not sure, but it will be something *like* bitcoin. And indeed, I have lot of confidence that the block chain technology is definitely here to stay.

EF: Speaking of the S&P 500 volatility, you showed in the late 1980s that the risk premium in the United States is countercyclical, but there isn't a consensus on why that is the case, is there? What do you think is the best explanation?

Harvey: What we're talking about when we're talking about the risk premium is that when you invest in the stock market, you expect to get a higher return on average than if you invest in Treasury bills. It is the same for investing in a corporate bond: You expect to get the higher rate of return for a risky corporate bond than for the equivalent maturity of a U.S. Treasury bond.

The risk premium changes over time. There are many different explanations as to why it would change, but the most intuitive one for me is that when you go into a recession,

there is much more uncertainty than when you're not in one. People are worried about what is going to happen in terms of their job stability or even their bonuses. It makes it less likely that you are going to take a chunk of money and invest it in the stock market. During these periods, stock prices fall. So think of the risk premium as the extra expected return you need to offer to get somebody into the stock market. It will be quite high in the depths of a recession.

On the other hand, when we are in good economic times, people are very calm, they do not want to miss out on financial opportunities, and the stock prices are driven up. When the stock price is high, almost by construction, the expected returns are lower. So you get a countercyclical pattern in risk premium. This pattern is found in many different types of markets.

EF: You co-founded the Duke University/*CFO Magazine* Global Business Outlook Survey, the poll of chief financial officers. Analyzing your survey results, you found, among other things, that CEOs and CFOs were overconfident and this affected their businesses.

Harvey: One of the questions we have been running for almost the entire survey, almost two decades, is that we ask the CEOs and CFOs to forecast the stock market return — the S&P 500 over the next year and the next 10 years. Why do we do that? We want them to provide a forecast of something that is common. We ask them about their firm also, but we are interested in the market as a whole. And on top of that, they are very knowledgeable of the S&P in general because they are often asked to explain why their company's stock price has changed — and you need to understand what is happening in the overall stock market to answer that question.

The unique thing in our question is we also ask for a confidence interval. We ask them for their assessment of a 1 in 10 chance the S&P 500 will be above X and a 1 in 10 chance it will fall below Y. So what we get is an 80 percent confidence interval for the forecast. We do not care that much about the accuracy of their forecast because it is very hard to forecast the S&P 500. We are more interested in the strength of their confidence in their forecast, and it turns out that the confidence bounds that they provide us are unreasonable by almost any metric. They are far too narrow. That was a surprising result.

We found that there was a correlation between this overconfidence and some of the investment policies within the individual firms. You see that this overconfidence affects the way that they choose investment projects and organize their capital structure.

EF: Financial economists have been saying for some time that index funds consistently outperform active management over time when fees are taken into account. Do you agree that this comports with what we see in the world, and if so, how do we account for the persistence of active management?

Harvey: I have thought a lot about this. The research on mutual funds basically concludes that the performance, once you have benchmarked to a passive investment, is negative. I have a new paper that uses the multiple testing techniques we talked about earlier and applies them to fund evaluation. Of course, if you have 7,000 mutual funds, some of them are going to look very good year after year after year, just by chance. In my research, we looked at mutual funds from 1976 onward and could not find one, not one, that significantly outperformed a passive benchmark.

For hedge funds, my colleague David Hsieh has concluded that the outperformance on average for hedge funds is essentially zero. This is better than mutual funds, but on average, it's zero.

So then the question is, well, why are there mutual funds? And why are there hedge funds? The key for hedge funds is that the excess performance is zero *on average* — that is different than every single hedge fund having a zero excess return. It means that there are many hedge funds out there that significantly underperform and many hedge funds that outperform. If you have a scientific process to try to separate the skillful from the lucky, then hedge funds become more attractive. So I believe that active management is something that, if it is done properly, can lead to positive excess returns.

The next category is maybe the most complex. There might be, let's say, a hedge fund that I know has zero excess return to benchmark, but I still might want to invest in it. How does that make sense? The key is that when we talk about the excess return, we think about adjusting for risk. If we take all of the risks that the hedge fund takes into account, and strip out the expected returns that are due to that risk, then whatever is left over is the so-called outperformance. Even with zero outperformance, I still might invest in that hedge fund because, as an investor, I do not have access to the types of risks that the hedge fund is actually taking. It is not as simple as buying an S&P 500 index fund. There are many other types of risks out there, and some of them are exotic. Maybe I would like to take some of those risks, and it is hard for me to actually do that on my own. For example, I might not be able to easily invest in an emerging market currency carry trade, where I buy the currencies of countries with high interest rates and sell the currencies of countries with low interest rates. I am just not equipped to do that, but this hedge fund is an expert at it.

The other thing to consider is behavioral biases on the side of the people selecting the investment managers. Even though the average return might be zero, people believe they are better than the average at selecting a mutual fund or a hedge fund. It is a classic behavioral bias: 85 percent of the people believe they are better than average.

EF: Researchers looking at the data on cash reserves of U.S. corporations have found that those reserves have been increasing, with 50 firms holding over $1 trillion in total. Why have corporations been holding so much cash?

Harvey: There are two main reasons and perhaps a third. The first one that people talk about is that a lot of this cash is offshore and it is not repatriated because of the punitive tax rates in the United States. The second has to do with thinking of this cash holding as a so-called real option. And what I mean by that is that you always want to be able to move quickly if you see a really good opportunity. You cannot wait around four months to get bank financing or float a secondary equity offering or something like that. You need to move with speed, and cash gives you the flexibility to move with speed. It might be that a firm is available for sale and you can use that cash to do the deal instantly.

EF: Do you think the importance of this has increased over time?

Harvey: We saw this flexibility in action during the financial crisis. Think of people like Warren Buffett, who had a lot of cash, just cleaning up, buying incredibly high-quality assets like Goldman Sachs at rock-bottom prices. So you could deploy that cash at a time when the expected returns were the highest. That is part of the flexibility. It is not just, "This firm is for sale, but we have to close it within a week or we're not going to get it"; it is also that through time, you can be strategic and pick and choose when you do the investment. During the financial crisis, it was not easy to borrow for an investment.

The third aspect is also related to time. This is just my opinion — I don't have any research paper on this — but I believe that with the exponential growth in technology, the rate of disruption has increased through time. It used to be product life was much longer than it is today. I think that some firms are thinking of the cash as insurance regarding this disruption. If a new technology arises, it gives them a cushion with which to try at least to attempt a counterattack. To adapt to the situation, to maybe disrupt the disruptor. I think if you put those three things together, it pretty well explains why cash holdings have increased. There are other technical reasons that are less important.

EF: You were editor of the *Journal of Finance* for six years, from 2006 to 2012. What are the main lessons for authors that you took away from that experience?

Harvey: For authors, the advice is probably no different for the *Journal of Finance* than for any top economics journal, namely, that the editors are looking for disruption. Indeed, it is not much different than the world of business; there is a status quo and we are looking for somebody to challenge that and to come up with a fresh approach. We are not as interested in ideas that tweak the status quo.

The ideal is that when people look at the abstract, they'll say, "Well, that can't be right." And then they read the paper and they are convinced. Within finance, it is also useful that your idea not only changes the way academics think, but it

also changes the practice of management. Just like if you're doing macroeconomics research, you hope not just to publish in, say, the *Journal of Political Economy*, but you hope that the policymakers will read it and that it changes the way they think about policy.

EF: What do you think are the most important open questions in finance?

Harvey: One is how you measure the cost of capital. We had the capital asset pricing model in 1964, but the research showed very weak support for it. We have many new models, but we are still not sure. That's on the investment side. On the corporate finance side, it would certainly be nice to know what the optimal leverage for a firm should be. We still do not know that. In banking, is it appropriate that banks have vastly more leverage than regular corporations? Again, we need a model for that. Hopefully these research advances are forthcoming. Some people have made progress, but we just don't know.

EF: Who were your main influences in your development as an economist?

Harvey: I was very lucky to be at the University of Chicago in the early to mid-1980s because there were all of these people who we knew were going to win Nobels. As students, we talked about it all the time. I remember seeing Gary Becker out jogging — he was always exercising — and we joked that he was jogging so that he'd be in good shape to stay alive to win the Nobel Prize. You were sitting in his class, in Robert Lucas' class, in Lars Hansen's class, and you knew they were going to win. And in the business school you had Merton Miller and Eugene Fama, an incredible environment for thinking and research.

The seminars were electric. Unlike the experience that often you see today where somebody goes through some PowerPoint slides, it was totally different. The audience members had thought about the research paper, and they were ready to go at it. And there were no hard feelings.

One thing that was pretty important for me in my development was an office visit with Eugene Fama, my dissertation adviser, where I had a couple of ideas to pitch for a dissertation. I pitched the first idea, and he barely looked up from whatever paper he was reading and shook his head, saying, "That's a small idea. I wouldn't pursue it." Then I hit him with the second idea, which I thought was way better than the first one. And he kind of looked up and said, "Ehh, it's OK. It's an OK idea." He added, "Maybe you can get a publication out of it, but not in a top journal." He indicated I should come back when I had another.

Even though he had shot down both of my ideas, I left feeling energized. The message from him was that I had a chance of hitting a big idea. That interaction, which I am sure he doesn't remember, was very influential — it pushed me to search for big ideas and not settle on the small ones.   **EF**

The Last Big Housing Finance Reform

BY HELEN FESSENDEN

In 2008, the Treasury Department took over near-broke Fannie Mae and Freddie Mac with a mandate to stabilize their finances. Seven years later, these two housing finance giants remain in government hands with no immediate prospects of escaping conservatorship. Many economists as well as policymakers in both parties agree the status quo is not a long-term solution and that these two government-sponsored enterprises (GSEs) should be downsized and at least partially privatized, but there is no consensus on how to achieve this. In fact, the share of single-family mortgages owned or backed by the GSEs rose to a high of 47 percent in 2013, up from 40 percent in 2007 and far higher than their 7 percent share in 1981. The enterprises also continue to hold a dominant position in the issuance of mortgage-backed securities (MBS), accounting for 70 percent of all issuances in the first quarter of 2015. The challenge of defining the basic mission and identity of the enterprises — public, private, or something in between — is not a new one, however. It was at the center of the debate the last time Washington tried to reform the GSEs, back in 1992.

On the surface, that year promised real momentum for housing finance reform. Congress had agreed to a costly rescue of the thrift industry three years earlier, and amid the bailout's widespread unpopularity, the George H.W. Bush administration and lawmakers in both parties were eager to prevent future rescues requiring taxpayer dollars. In 1991, Congress followed through with legislation that strengthened regulators' authorities over banks with federal deposit insurance. Then, with a strong push from the Treasury Department, Congress turned to reforming Fannie and Freddie, which were taking on an increasingly important role in providing liquidity to the housing market by buying mortgages from lenders and then issuing MBS backed by those loans.

But this time around, Congress reached a deal that left much of the status quo intact. Most importantly, it left in place the implicit government guarantee that, in the view of investors, backed the enterprises. When such a guarantee is present, investors are likely to underprice the risks the institutions take. And while the 1992 reform was an attempt at addressing this problem by ramping up regulation, many observers argue that it fell short. Among its outcomes were capital requirements far lower than those imposed on banks and thrifts, and a regulator that some say lacked the supervisory and regulatory tools commensurate with the GSEs' size and exposure to risk.

"The fundamental problem in 1992 was that it formalized the hybrid public-private model, which is destined to fail," says economist Scott Frame of the Atlanta Fed, who worked with the Treasury Department on the 2008 GSE rescue. "If you privatize the gains and socialize the losses, you will create excessive risk-taking incentives."

Modest Beginnings

The GSEs' original mission was to buy particular categories of government-insured mortgages, freeing up liquidity for lenders to issue more loans. The Federal National Mortgage Association, or Fannie Mae, was chartered in 1938 and initially bought mortgages that were backed by either the Federal Housing Administration or the Veterans Administration. In 1954, Congress converted it from a government agency to a mixed-ownership entity and granted it certain tax advantages. Another step occurred in 1968, when Congress took Fannie off the federal budget and turned it into a publicly traded company. Meanwhile, the Federal Home Loan Mortgage Association, or Freddie Mac, was chartered in 1970 and targeted its business toward buying mortgages from

> Policymakers concerned over the future of Fannie Mae and Freddie Mac may find a cautionary tale in the last time policymakers sought to reform the enterprises more than two decades ago

The Congressional Budget Office issued a report in April 1991 that outlined suggestions for improved oversight of Fannie Mae and Freddie Mac.
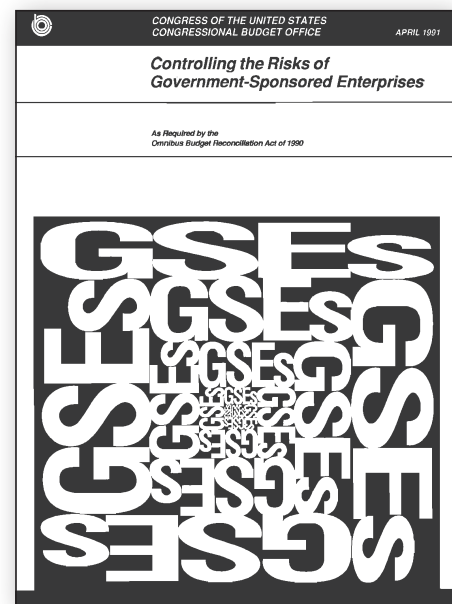
thrifts. In 1971, Freddie issued its first mortgage-backed securities, and it proceeded to grow its MBS business while Fannie tended to keep its mortgage purchases on its books. As a result, Freddie was better able to handle the interest rate volatility in the late 1970s and early 1980s, because it had transferred interest-rate risk to MBS investors. In contrast, Fannie struggled to stay afloat as many of the mortgages it bought and held in its portfolio lost value to inflation.

Once interest rates stabilized, both GSEs dramatically expanded their business, including issuance of MBS. In 1983, the two issued a combined $35 billion in MBS; by 1992, it was almost $675 billion. The number of mortgages held on their books also expanded, from a combined $49 billion purchased in 1983 to $443 billion in 1992. This rapid rate of growth far outpaced the rise in the value of the single-family mortgage market over the same period, from $202 billion to $894 billion.

These numbers would rise even more dramatically in the years that followed. But it was that rise in exposure in the 1980s and early 1990s, combined with the woes in the banking and thrift sectors, that compelled the Bush administration to turn to reforming Fannie and Freddie. Some in the administration became concerned that the GSEs could pose a long-term risk to taxpayers as long as their status as public-private hybrids remained unresolved. Multiple government agencies, including the Treasury Department and the Congressional Budget Office, addressed these worries in reports in the spring of 1991, and they concluded that Fannie and Freddie needed formal capital requirements and stronger government oversight, even though they were not in imminent danger of failing and had high credit ratings. The CBO report, for example, argued that the GSEs had developed more comprehensive ways to manage credit- and interest-rate risks, but the feature of the implicit government guarantee meant that formal capital requirements would be needed to serve as a buffer against taxpayer liability.

The House acted first, passing a bill in the fall of 1991 to establish a new GSE overseer within the Department of Housing and Urban Development: the Office of Federal Housing Enterprise Oversight, or OFHEO. Notably, this office would be funded from dedicated fees, like the Securities and Exchange Commission, rather than annual appropriations, which tend to be less predictable and more politicized. The bill also set a 2.5 percent capital requirement for the GSEs' balance-sheet assets (the loans it held on its books) and 0.45 percent for off-balance-sheet assets (the MBS). (By comparison, banks had a requirement of 4 percent for home loans they held and 1.6 percent for GSE MBS.) Finally, the bill authorized OFHEO to impose stress tests to see if higher capital requirements were necessary; if the GSEs failed those tests, they could face cease-and-desist orders and fines. As soon as the bill headed to the Senate, however, Fannie's senior management warned it would drop its support due to those two provisions, according to media accounts at the time. This move could have spelled trouble for the bill's prospects in the Democratic-controlled Congress, which had at the time liberal constituencies that also were close to the GSEs.

Negotiators released a new draft the following spring, this time making it easier for the GSEs to challenge regulatory findings and making it harder for OFHEO to set fines. Another provision established an affordable housing mandate, under which a certain percentage of loans and MBS on the GSEs' books had to come from home purchases in underserved communities. Backed by fair housing groups, the provision was intended to make borrowing easier and cheaper for low-income and minority homebuyers.

In the fall of 1992, the bill was finally close to passage when Fannie sent another unexpected warning: It still opposed the bill because, in its view, OFHEO had too much say over risk-based capital standards given that it lacked the necessary expertise to understand them, and it ultimately could cause a nationwide credit crunch if it compelled the GSEs to raise capital. According to press reports, a deal was struck in which OFHEO's funding was moved over to the appropriations process, and the capital-standards provision stayed. Congress finally sent the legislation, formally titled the Federal Housing Enterprises Safety and Soundness Act, to President Bush to sign in October.

The Legacy of Reform

One of the most important legacies of the 1992 reform is what it did *not* do: namely, resolve the question of whether the government would come to the GSEs' aid if they became distressed. On one hand, they were chartered by Congress, had access to a $2.25 billion line of credit with the Treasury Department, and were granted special tax and regulatory exemptions on account of their unique status. They were also entrusted with a public mission to enhance liquidity in the housing market and, after 1992, to meet affordable housing goals.

This was the "government" part of their acronym, and collectively, these provisions cemented the belief among investors that the GSEs enjoyed implicit support from Treasury. For this reason, the securities issued by Fannie and Freddie carried a lower interest rate than those issued by the private sector, reflecting the assumption that their debt was ultrasafe. At the same time, the GSEs had a private shareholder structure and New York Stock Exchange (NYSE) listings. This model worked well for them in the 1990s; the GSEs' combined net income in 1992, more than $2.2 billion, rose to $14 billion in 2002.

The 1992 reform did include language stating that the government would not come to the GSEs' aid if they were distressed. But the law left all of their quasi-governmental advantages untouched, thereby preserving the implicit government guarantee that was so central to their growth. As Thomas Stanton, a Washington lawyer who was involved with the legislation, points out, the proof of the durability of the implicit guarantee was in how markets treated GSE securities.

"Banks, pension funds, foreign governments — everyone — kept treating Fannie and Freddie MBS as if they were

almost as safe as Treasuries," he says. "So whether you have some language in the bill purporting to prohibit a bailout is really beside the point. And when these enterprises ultimately grow so large and become too big to fail, a government guarantee is inevitable."

Several economists have tried to estimate the size of the subsidy that the guarantee provided to the GSEs. By issuing securities at exceptionally low interest rates reflecting their perceived safety, and then using the money raised to buy higher-yielding mortgage securities from the private sector, the GSEs could count on making money off of this spread. In 2001, the Congressional Budget Office estimated that this differential created a subsidy worth $3.7 billion in 2000 for the GSEs' MBS business, in addition to $1 billion derived from their tax and regulatory exemptions. (That same year, in comparison, Fannie and Freddie reported a combined net income of $8.1 billion.) In another widely cited paper, published four years later, Federal Reserve economists Wayne Passmore and Shane Sherlund and Gillian Burgess of New York University estimated that the GSEs had a debt-funding advantage that ranged from 24 to 40 basis points over long-term, highly rated corporate debt.

The GSEs also earned money in other ways — notably, by securing fees from MBS buyers to guarantee timely payment of interest and principal. These "g-fees" — basically, an insurance premium taken out of the interest payments on the underlying loans — grew steadily until the financial crisis, from a combined $1.8 billion in 1992 to almost $11 billion in 2008. Because these guarantees also put the GSEs on the hook to pay back investors if these securities soured, however, they drove the enterprises' rapid financial deterioration in 2008.

Benefits and Costs

For their part, Fannie and Freddie executives consistently argued that this advantage ultimately benefited homeowners because it led to savings in the form of lower interest rates and the availability of fixed-rate, 30-year mortgages. Research has found those benefits to have been modest, however. In their 2005 paper, Passmore, Sherlund, and Burgess analyzed the difference in rates between conforming mortgages backed by GSEs and those for "jumbo" mortgages (that is, loans too large to qualify under the GSEs' conforming limit). They found not just a narrow spread, but a minimal pass-through effect of the GSE debt-funding advantage to homebuyers. Looking at more than 1 million loans from 1997 to 2003, they calculated a spread of only 15 to 18 basis points between conforming and jumbo loans. As for the savings passed along to homebuyers that resulted from the GSEs' cheaper yields, the researchers calculated that this amounted to about 7 basis points.

Economists argue that another effect of government guarantees that protect investors is to weaken market discipline, resulting in too much risk. In principle, regulation can help offset increased risk-taking, but critics argue that OFHEO had insufficient tools to do that.

"The excessive risk-taking incentives created by this hybrid model need to be countered with a strong regulatory regime," says Frame of the Atlanta Fed. "With the GSEs, you had the facade of regulation but no teeth."

For example, the office lacked the independent authority to bring lawsuits against the GSEs or to replace their executives. In the event the GSEs faced insolvency, OFHEO could opt to keep the enterprises operational (known as conservatorship) but could not close them down (that is, place them in receivership) as the FDIC can with struggling banks.

One of the more important but overlooked aspects of the reform, however, may have been the more esoteric issue of OFHEO's authority to conduct stress tests — one of the key sticking points during the 1991-1992 negotiations. Under the final deal, OFHEO could not set the GSEs' minimum leverage capital requirements by itself, but it was authorized to devise and conduct stress tests to assess the existing risk-based capital requirements for the GSEs. It took a full 10 years, however, to write and implement the rule; moreover, when the stress tests were conducted, up through the crisis, they underestimated the GSEs' losses.

A recent Atlanta Fed working paper that Frame co-authored with Kristopher Gerardi and Paul Willen dissected OFHEO's stress test methodology to find out why it failed. They noted that OFHEO used mortgage data from 1979-1997 to create the statistical model that guided the tests after 2002 — which meant the model did not reflect the many changes in mortgage underwriting practices after 1997. As a sign of how poorly this model worked, the researchers found that actual defaults during the housing bust were four to five times greater than what the OFHEO model predicted. To be sure, many market participants and regulators alike underestimated the extent of losses related to the housing bust. But in the case of OFHEO's stress tests, the researchers found that if the agency had used an alternative model with real-time mortgage loan data, it would have dramatically increased the quality of its forecast of defaults starting in 2005; similarly, if OFHEO had used real-time home price data, its model would have determined as early as late 2006 that the GSEs lacked enough capital to handle the risk of a national housing slump. But instead, the researchers found that OFHEO used an adverse home-price scenario that predicted property values would actually rise for the first 10 quarters of the stress test — contrary to the idea of a stress test, namely, to see how an institution would perform during a period of market turmoil.

The Atlanta Fed researchers traced these shortcomings back to the 1992 law, which required that OFHEO publish every detail of the model's construction through the federal rule-making process. This is a process that can take years, with multiple rounds of notice-and-comment and interagency clearance, which would make any updating an onerous task. For this reason, it took a decade to finish the first stress test; after that, the researchers argued, OFHEO lacked the time, resources, and political capital to update the model.

A Sudden Collapse

In the 15 years following the reform, the growth of the U.S. housing market bolstered the GSEs' performance as well. The GSEs kept the bulk of their mortgage purchases in relatively high-quality loans, and they kept their capital cushions, on average, higher than the minimum requirement. After 2003, however, they began buying more MBS issued by both bank and nonbank lenders with looser standards, including those backed by "Alt-A" and subprime loans. The GSEs' combined purchases of "private label" MBS rose from about $68 billion in 2002 to almost $300 billion in 2006. Then, when private investors began shedding these securities in 2007 as foreclosures began climbing and devaluing the underlying loans, Fannie and Freddie ramped up their purchases. As a result, their market share in the mortgage securitization business, which had fallen from 50 percent in 2003 to 27 percent in 2006, climbed to 44 percent in late 2007.

At the same time, the quality of the loans underlying the GSEs' MBS fell as their market share expanded. From 2003 to 2007, the percentage of these loans with a loan-to-value ratio over 80 percent (that is, for homes with little or no equity) rose from 12 percent to 23 percent. Some have contended that this shift was driven by the affordable housing mandate, which allowed the GSEs to apply private-label MBS toward their housing goals. Recent research on this topic suggests the impact is less clear-cut, however. For example, three economists at the St. Louis Fed —Ruben Mernandez-Murillo, Andra Ghent, and Michael Owyang — have found no evidence that lenders ramped up subprime loan originations or changed the pricing of their mortgages so that they would conform to the various cutoffs (for example, ensuring that a certain percentage of loans were made to homeowners under an income threshold) that the affordable housing provisions had mandated. As economist Ronel Elul argued in a recent article in the Philadelphia Fed's *Business Review*, profit and desire for market share, rather than the affordable housing provisions, prompted this late drive by the GSEs to buy private-label securities. "They did not significantly contribute to the development of risky lending practices in this sector," he concluded.

In the second half of 2007, the losses began to rise as the GSEs began paying out credit guarantees on bad loans. By summer 2008, the two had lost $14.2 billion over the year, and their combined capital dropped to about 1 percent. In July 2008, Congress established a new overseer for the GSEs, this time with the power of receivership, and Treasury Secretary Henry Paulson ordered a classified review of their finances, concluding that the GSEs no longer had enough capital to cover their obligations. Because the size of their exposure was so vast — $5.2 trillion in held or guaranteed mortgage debt, almost half of the roughly $11 trillion in household mortgage debt outstanding at the time — Paulson decided that only a government takeover could prevent systemic contagion. Treasury then executed the takeover in a surprise operation over the first weekend of September.

Paulson's concern that the GSEs no longer had enough capital to cover their losses was borne out by the numbers. Over the course of the bailout, the two suffered a capital erosion of $232 billion, $181 billion of which was in losses from credit guarantees. The bailout itself cost $187.5 billion.

Still Seeking a Solution

Under the Treasury Department's conservatorship, it offered assistance in the form of stock warrants so that the GSEs could continue to meet their obligations. The enterprises were placed under new leadership and de-listed from the NYSE, and they had to give up their dividends and any future profits to the government. Paulson and other senior administration officials assumed this arrangement would be only a temporary solution, and that Congress would legislate a permanent fix, whether it was a full-scale privatization, a shrunken but well-defined government backstop role, or something in between.

That has yet to happen. To date, the GSEs have yielded about $225.5 billion in their returns to the government, more than the dollar cost of their bailouts. The Treasury Department released a white paper in 2011 that laid out options for winding down or reforming the enterprises, but it did not kick off any sustained legislative action. To date, no proposal for reform has been able to advance in Congress beyond the committee level or gain support in both chambers. At the same time, as noted above, the GSEs back a greater percentage of mortgages than ever before.

Frame, of the Atlanta Fed, says the current impasse over resolving the GSEs' fate still leaves in place significant risks.

"As it stands, the status quo offers benefits in terms of significant control over mortgage credit standards, risk pricing, and generally lower mortgage rates than would otherwise be the case," he says. "But what it does do is generate an enormous contingent liability. That is still the case with Fannie and Freddie." **EF**

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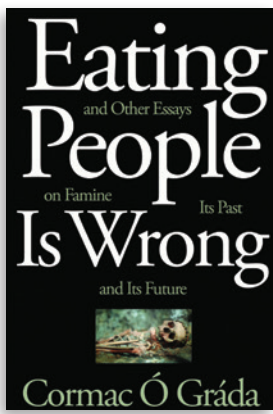
Food Fights

EATING PEOPLE IS WRONG, AND OTHER ESSAYS ON FAMINE, ITS PAST, AND ITS FUTURE
BY CORMAC Ó GRÁDA
PRINCETON, N.J.: PRINCETON
UNIVERSITY PRESS, 2015, 248 PAGES

REVIEWED BY JESSIE ROMERO

The Third Horseman of the Apocalypse has visited every corner of the world. Europe, Asia, Africa, the Americas — all have suffered the ravages of famine. Sometimes weather is to blame; 600,000 people starved to death in France in 1709-1710 following a winter so cold it became known as the "Great Frost." Sometimes the culprit is war, as when the Germans blockaded Leningrad and residents resorted to eating leather and wallpaper paste (and, according to some accounts, each other). In *Eating People is Wrong, and Other Essays on Famine, Its Past, and Its Future*, Cormac Ó Gráda, professor emeritus of economics at University College Dublin, explores the political, cultural, and economic forces that combine to create such crises.

In the title essay, Ó Gráda illustrates the "repulsiveness" of famines by broaching a gruesome topic: cannibalism. Ó Gráda finds that cannibalism, while rare, is more common in famines than previously believed. But in some cases, he says, reports of cannibalism are an attempt to demonize the "other" or achieve political ends. He describes some stories of cannibalism during famines in Ireland as colonialist discourse aimed at "indigenous savages."

In an essay on the Great Bengal Famine of 1943-1944, which killed more than 2 million people, Ó Gráda re-examines the conclusions of Nobel laureate Amartya Sen on the famine's causes. In an influential 1981 book, Sen blamed the famine not on an actual lack of food, but rather on large-scale speculation and hoarding that drove up prices. In contrast, Ó Gráda offers evidence of a substantial food shortage, precipitated by a poor rice harvest in 1942. For example, Indian officials conducted multiple food drives, which involved searching homes and businesses, but failed to turn up any hoarded food. In addition, the 1943 harvest was good, which should have prompted the release of hoarded supplies. But prices remained high in early 1944, arguing against the existence of large-scale hoarding.

Ó Gráda attributes the famine to British and Indian officials who repeatedly denied the problem and were unwilling to divert ships or food from the war effort. The problem in Bengal in 1943, he writes, was "the failure of the Imperial power to make good a harvest shortfall that would have been manageable in peacetime. ... The famine was the product of the wartime priorities of the ruling colonial elite."

The role of markets in famines is a contentious issue. On the one hand is the classical view that markets both prevent and remedy famines; in *The Wealth of Nations*, Adam Smith wrote that all famines in Europe had been the result of "the violence of government attempting, by improper means, to remedy the inconveniences of a dearth." On the other hand, a more populist tradition argues that markets exacerbate famines by diverting food away from the poor to the rich.

At the outset of the third essay in the book, it seems that Ó Gráda hopes to help resolve this debate by studying how markets functioned during four famines: France in 1693-1694 and 1709-1710, Finland in 1868, and Ireland in 1846-1852 (the Irish potato famine). In a technical section that most non-experts will likely find difficult to follow, he analyzes price data and concludes that, rather than markets helping or hurting, these four famines were the result of disastrous crop shortfalls and inadequate government assistance for the poor. But Ó Gráda does not go on to explain how these findings relate to a broader understanding of the role of markets in famines, leaving the promise of the essay unfulfilled.

The responsibility of government is a central theme in Ó Gráda's chapter on the Great Leap Famine, which killed tens of millions of people in China between 1959 and 1961. Mao Zedong's "Great Leap Forward," an attempt to forcibly industrialize the country, hobbled agricultural production and left millions of people in the countryside without enough food.

Ó Gráda's essay on the Great Leap Famine is mostly an analysis of three recent books on the famine, and as such lacks a clear conclusion. Still, he raises a number of interesting questions, including Mao's culpability, the role of local officials, and — one of the biggest questions surrounding the famine — how many people actually died during it.

Determining an accurate excess mortality rate (the number of people who died beyond the natural death rate) has been complicated by poor record keeping and limited access to what records there are. As a result, Ó Gráda explains, estimates vary widely and often reflect political ideology. Modern supporters of Mao claim only 2 million to 3 million people died; critics contend as many as 60 million died. The truth is probably somewhere in the middle; demographers have estimated excess mortality of between 18 million and 32.5 million — still making the Great Leap famine the most deadly in history.

In recent decades, famines have become relatively rare and small by historical standards, the result of productivity increases in agriculture, improved communication and transportation networks, and numerous international aid agencies. Still, while extraordinary famines are on the wane, steady-state malnutrition remains a serious problem. As Ó Gráda warns, "'making famine history' is not the same thing as 'making hunger history.'" **EF**

State Labor Markets: What Can Data Tell (or Not Tell) Us?

BY SONYA RAVINDRANATH WADDELL

From December 2007 through January 2010, the Fifth Federal Reserve District lost 766,000 net jobs — more than 5 percent of total employment in the District. Over the same period, the regional unemployment rate jumped from 4.4 percent to 9.4 percent. During the recovery, employment grew, and by March 2015, payroll employment in the region exceeded its pre-recession level by 179,100 jobs while the unemployment rate had fallen back to 5.5 percent (see chart).

As the national and regional economies have undergone the fluctuations of the last eight years, understanding state and local labor market conditions has been extremely important to academic economists, to practitioners in state and local government, and to other organizations involved in local economic development. Employment statistics at the national level mask significant movement at the state level, and even state numbers mask activity at the metropolitan area or county level. In addition, information availability at the state and local level is limited — for example, we don't have timely data on gross domestic product or consumer spending — so employment numbers are used even more broadly to understand local economic conditions and the breakdown of industry in a region.

There are many sources of labor market information, most of which are maintained by the Department of Labor's Bureau of Labor Statistics (BLS). For example, the information in the opening paragraph above on the number of net jobs lost in the Fifth District during the recession came from the BLS's Current Employment Statistics (CES) program. While the national unemployment rate is developed in the BLS's Current Population Statistics (CPS) area, state and local unemployment rates come from the BLS's Local Area Unemployment Statistics (LAUS) program.
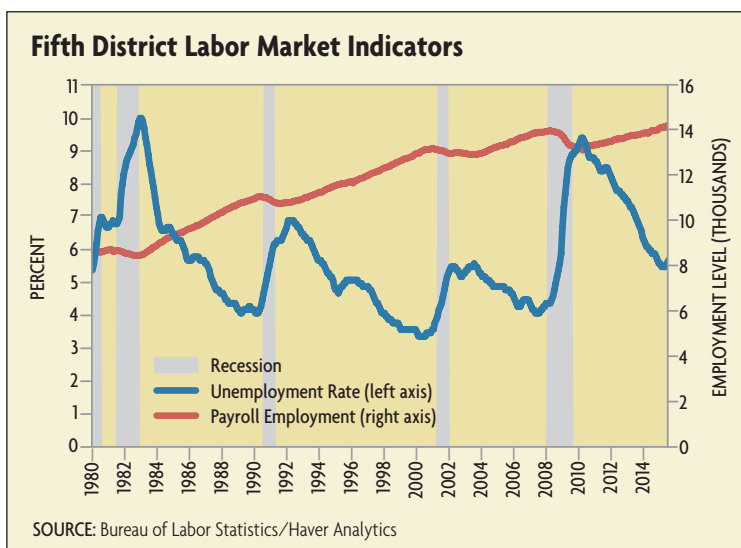
This article will focus on understanding the origination and use of three critical sources of labor market information at the state and local level: the CES data, the LAUS data, and the Quarterly Census of Employment and Wages (QCEW) data. It will shed light on questions such as what economists mean when they refer to "establishment" or "household" data and what role revisions play in developing the data. Finally, how does one interpret the data and what can it tell us about the Fifth District economy?

The Quarterly Census of Employment and Wages (QCEW)

The QCEW is the most comprehensive source of information on employment, hours, and wages by industry in the United States. The QCEW program cooperates with the various state labor market information agencies to collect data from the roughly 9 million U.S. business establishments covered by unemployment insurance (UI) on a quarterly basis (as well as federal agencies subject to the Unemployment Compensation for Federal Employees program). The data represent about 97 percent of all wage and salary civilian employment in the country and comprise a complete set of monthly employment and quarterly wage information at the national, state, metropolitan area, and county levels (see map).

In the decades since the national UI system was instituted in 1938, coverage has become quite broad. Today, all workers are covered except members of the armed forces, the self-employed, proprietors, domestic workers, unpaid family workers, and railroad workers covered by the railroad insurance system. UI coverage is largely consistent across states, although there are some differences; for example, in a number of states, certain types of nonprofit employers, such as religious organizations, are given a choice of coverage or exclusion. State agencies collect data on employment and wages from businesses and submit the data to the BLS each quarter.

Given that the QCEW program provides such a comprehensive view into employment, why do we need any other source of employment information? The first reason is timeliness. The QCEW data is usually released about six months after the end of the period in question, and those who follow the trajectory of the national and state economies depend upon getting data as soon as possible. Second, as noted above, states can differ in their requirements for UI coverage, which can create some inconsistency when comparing QCEW data across states. Third, QCEW provides no information on the number of unemployed in an economy. To address these limitations of the QCEW data, economists rely on survey data such as that collected through the CES and the CPS programs.

Fifth District Labor Market Indicators

Legend:
- Recession
- Unemployment Rate (left axis)
- Payroll Employment (right axis)

Left axis: PERCENT (0–11)
Right axis: EMPLOYMENT LEVEL (THOUSANDS) (0–16)

SOURCE: Bureau of Labor Statistics/Haver Analytics

The Establishment Survey and the CES

The modern surveys and methods for collecting information on employment and unemployment in the United States developed throughout the 20th century. Before 1915, only a few states produced employment statistics. In 1915, the BLS entered into a cooperative agreement with New York and Wisconsin whereby sample data was collected from employers by a state agency and used jointly with the BLS to prepare state and national series. The Great Depression prompted increased interest in employment data and by 1933, the federal government published employment, average hourly earnings, and average weekly hours for total manufacturing, 90 manufacturing industries, and 14 nonmanufacturing categories. By 1940, estimates of total nonfarm employment for all 48 states and the District of Columbia were available. Since 1949, the CES program has been a joint federal-state program that provides employment, hours, and earnings information by industry on a national, state, and metropolitan area basis.

The CES sample covers employment, hours, and earnings from about 143,000 businesses and government agencies, which, in turn, cover approximately 588,000 individual worksites — about one-third of all nonfarm payroll employees in the 50 states and Washington, D.C. The sample is drawn from the QCEW database (that is, from the 9 million establishments that are covered by unemployment insurance).

The CES data is frequently cited. On the first Friday of every month (unless the Friday is a holiday), the BLS releases information on the number of jobs added to the U.S. economy the previous month; for example, on July 2, 2015, the BLS announced that the United States added 223,00 jobs in June. Later in the month, the state data is released. For example, on July 21 the BLS announced that Virginia added 13,400 jobs in June.

Although modeling techniques are used to develop the CES results for some locality and industry combinations that do not have a large enough sample, at the state level estimates are based on the same establishment reports as the national estimates, using direct sample-based estimation. The size of the samples for Fifth District states can be seen in the table; it is important to remember that because state and area samples are smaller, the error component associated with these estimates are bigger than that for the nation.

The Household Survey and the LAUS

In the beginning of July, the public found out not only that the United States had added 223,000 jobs in June, but also that the unemployment fell slightly to 5.3 percent — in other words, 5.3 percent of the total labor force was defined as unemployed by the household survey. The figure of 223,000 jobs came out of the CES program, discussed above. The unemployment rate, however, is developed through an entirely different survey; while the payroll numbers come from a survey of establishments, the labor force and unemployment rate come out of a survey of about 60,000 households across the United States.

Precise definitions, or at least more specific concepts, of

Average Weekly Wage Across the Fifth District

Wage (Dollars)
- 531 - 637
- 638 - 698
- 699 - 759
- 760 - 869
- 870 - 1696
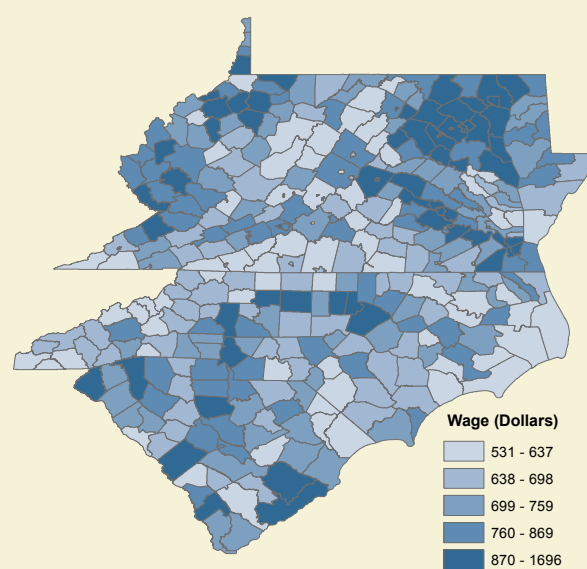
SOURCE: QCEW (December 2014)

labor force, employment, and unemployment were developed during the Depression and throughout the 1930s. The mass unemployment in the early 1930s created the need to directly measure the number of jobless people, and widely conflicting estimates based on a variety of indirect techniques began to appear. In 1940, the Works Progress Administration used the concepts developed in the late 1930s for a national sample survey of households, called the Monthly Report of Unemployment. The household survey was transferred to the Census Bureau in 1942 and in 1948, the name was changed to the Current Population Survey (CPS). Although the Census Bureau continues to collect the data, responsibility for analyzing and publishing the CPS labor force data was transferred to the BLS in 1959.

The Department of Labor began developing unemployment estimates at the subnational level during World War II in order to identify areas with inadequate labor supply, material shortages, or transportation difficulties. After the

Number of Unemployment Insurance Accounts and Establishments in the CES Sample

	UI Accounts (% of U.S.)	Establishments (% of U.S.)
U.S.	143,179 (100)	587,531 (100)
DC	944 (0.66)	1,441 (0.25)
MD	2,069 (1.45)	7,931 (1.35)
NC	3,778 (2.63)	22,309 (3.80)
SC	2,195 (1.53)	9,530 (1.62)
VA	2,669 (1.86)	13,398 (2.28)
WV	1,635 (1.14)	5,501 (0.94)
Fifth District	13,290 (9.28)	60,110 (10.23)

SOURCE: Bureau of Labor Statistics, as of March 17, 2015

Major Sources of State and Local Labor Market Information

BLS Program	Major Data Pieces	Geography Available	Sample
Quarterly Census of Employment and Wages (QCEW)	Employment, Hours, Wages	County, MSA, state, U.S.	Data collected from UI records: 97% of all wage and salary civilian employment
Current Employment Statistics (CES)	Payroll employment	MSA, state, U.S.	Approximately 143,000 businesses and 588,000 individual worksites (about ⅓ of all nonfarm payroll employees)
Current Population Survey (CPS)	Unemployment rate, Labor Force Participation rate	U.S.	Approximately 60,000 U.S. households
Local Area Unemployment Statistics (LAUS)	Unemployment rate, Labor Force Participation rate	County, MSA, state	CPS sample plus model/other data (*signal+noise* for state data *Handbook method* for sub-state)

SOURCE: Bureau of Labor Statistics/Author's Analysis

war, the emphasis was to identify areas of labor surplus, and a program was established to classify areas in accordance with severity of unemployment. In 1950, the Department of Labor published a handbook entitled *Techniques for Estimating Unemployment* in order to produce comparable estimates of the unemployment rate for all states. This led to the formulation of the "handbook method" in the late 1950s: a series of computational steps designed to produce local employment and unemployment estimates using available data at a much lower cost than a direct survey.

In 1972, the BLS assumed technical responsibility for the state and local program, and in 1973 a new system for developing labor force estimates was introduced, combining the handbook method with the concepts, definitions, and estimation controls from the CPS. Beginning in 1989, the handbook estimation was discontinued for states in favor of time series statistical modeling, although estimates for most substate areas continue to be based on the handbook method. Until 1996, for a handful of the largest states, labor force estimates were calculated directly from the CPS data. Starting in 1996, however, labor force data have been estimated for all states using the time series approach mentioned in this section.

At the state and local level, the 60,000-household sample is not large or representative enough to use the straight sample data. In January 2015, for example, the CPS sample contained 3,347 individuals (in 1,567 households) from North Carolina — only about 0.04 percent of the total state population. In West Virginia, the CPS sample in January 2015 contained only 2,839 individuals from 1,156 households. Variance estimates of employment and unemployment in the household survey are low enough to be acceptable for the nation, but at the state level, the small sample size results in the data being much more variable.

To address the high variability, the BLS develops estimates of unemployment using signal extraction techniques developed in the time series literature. The model takes advantage of the time series of sample estimates in order to reduce the variance by pooling data over time for a given area.

In other words, the model uses past data to help reduce the variance associated with current estimates. In addition, the model incorporates additional data series. To estimate employment, the model uses CES data; to estimate unemployment, the model includes unemployment claims as an input. (The labor force is then the sum of employment and unemployment.) The model is referred to as a signal-plus-noise model because it postulates that the observed CPS estimate consists of a true, but unobserved, labor force value (the signal) plus noise that reflects the error arising from taking a sample of the adult population rather than the full population.

To calculate labor force indicators at the local labor market level, the handbook method is used. As mentioned earlier, this approach is a building block approach that utilizes data from the CPS, the CES program, state UI systems, and the American Community Survey (recently changed from the decennial census) to create estimates that are adjusted to statewide measures of employment and unemployment. Below the labor market area level (i.e., for counties and cities/towns), estimates are prepared using disaggregation techniques based on inputs from the decennial census, annual population estimates, and current UI data.

Data Revisions and Interpreting Differences

There is another important part of CES data development: the annual benchmarking process. Because the CES data is a sample, it does not account for the opening and closing of firms during the year. When the economy is growing and new businesses are opening, the CES data is likely to underestimate employment growth. On the other hand, in periods of decline, when firms are closing their doors, the CES data is likely to overestimate employment. The CES program uses non-sampling methods to account for this bias, but the BLS also uses the QCEW data to adjust the CES data (called "benchmarking") — a revision that can have a substantial effect on the employment numbers. For example, with the benchmark that came out on March 17, 2015, the average employment in the Fifth District in 2014 was revised up by 9,300 jobs.

The LAUS estimates are also revised. Monthly, the BLS imposes a process to ensure that substate employment/unemployment estimates add up to the state estimates and state totals add up to the national total. Annual revisions are also made at the beginning of each calendar year using statistical techniques that are built into the model process and incorporating changes to the inputs (revision to the CES

data, revision to unemployment insurance claims counts, new population controls, etc.).

It is not uncommon at the state level to see contradictions between the CES data and the LAUS data, particularly before the annual revisions occur. That's because the data come from different surveys. Furthermore, even when the data trend together (see table), they show slightly different numbers for employment. Most of the time, what analysts are interested in are the trends, however, and particularly the QCEW and the CES data tend to trend together.

### Where Else Do Labor Market Data Come From?

Different agencies repackage the QCEW data and combine them with other data to offer the user alternative ways of analyzing local area labor markets. For example, the Census Bureau produces Longitudinal Employer-Household Dynamics (LEHD) data using UI earnings data, QCEW data, and censuses and surveys. Firm and worker information are used to create data on job-level quarterly earnings, on where workers live and work, and on firm characteristics. Some of these data are available only to qualified researchers on approved projects, but the LEHD program also creates public use data sets and online tools.

States themselves often provide further information about state and local labor markets. The Virginia Employment Commission (VEC), for example, provides data on Virginia labor markets through its Labor Market Information (LMI) website. Some of the data, such as unemployment rates, are just repackaged BLS data. Some other data, such as characteristics of the unemployed who have access to UI benefits, include pieces that are available for states through the BLS as well as pieces or geographies unavailable anywhere else. Finally, some of the data, such as characteristics of new job applicants or top employers by county, are available only through the VEC's LMI tools. Different states have different amounts of data available to the public. For the most part, outside of the QCEW, CES, and LAUS data, the information the public can get and at what level of geography varies considerably by state.

Interpreting the Data for the Fifth District

Although there can be short-run discrepancies between the CES and the LAUS data, over the long term they usually tell the same stories. In the Fifth District, the main story they tell is that the states in the southern part of the District experienced a more severe economic downturn but have recovered more quickly and more completely than the northern part of the District. Combined, North Carolina and South Carolina lost almost 60 percent of the 828,700 jobs lost in the Fifth District from December 2007 through February 2010, but both of them regained the losses of the recession by the fall of 2014. As of June, North Carolina was 70,200 jobs above the pre-recession level and South Carolina was 53,700 jobs above. On the other hand, although employment declined less steeply (as a percentage of total employment) in Virginia, Maryland, and the District of Columbia,

Fifth District Employment Growth
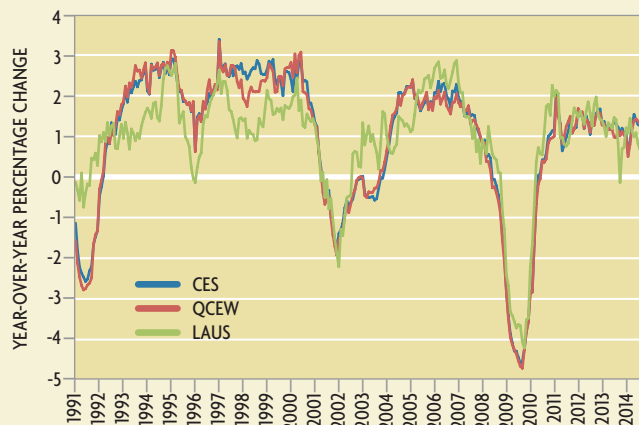
SOURCE: Bureau of Labor Statistics/Haver Analytics

they have also not grown as strongly during the recovery, particularly in the last few years.

A major factor in the slower recovery in the latter states has been employment in professional and business services. Using the CES data, we can drill down by industry; in Virginia, for example, the professional and business services industry was a driver of growth coming out of past recessions, but the industry expanded more slowly coming out of this recession. More recently, that sector of the state has suffered losses. One of the contributors to the sluggish growth in the northern part of the region, and particularly in professional and business services, is the decline in and uncertainty surrounding federal government contract spending, which plays a large role in the economies of Maryland and Virginia.

West Virginia also survived the recession better than North Carolina and South Carolina, but that state's labor market has also been struggling in the last few years. The decline in energy prices and, more particularly, the contraction in the coal industry has hit the state hard. Of the 8,800 net jobs lost from June 2014 through June 2015 in West Virginia, 2,900 were in mining and logging.

This story plays out in the LAUS data, as well. For example, in December 2009, South Carolina, with an unemployment rate of 11.7 percent, had one of the top unemployment rates in the country. By June 2015, the rate had fallen to 6.6 percent.

Conclusion

The Fifth District economy has expanded slowly but steadily in recent years — a trend best evidenced by the employment data provided through the Bureau of Labor Statistics. In addition, much of the job expansion and the sharpest decline in unemployment has occurred in the southern part of the District, namely in North Carolina and South Carolina. We know this primarily because of the data the BLS provides to the public. Economists, analysts, and various researchers use this information not only to judge current economic activity, but also to better understand the structure of local economies and to analyze which other parts of the economy affect and are affected by labor markets. **EF**

State Data, Q3:14

	DC	MD	NC	SC	VA	WV
Nonfarm Employment (000s)	752.0	2,621.5	4,150.7	1,949.9	3,777.0	761.9
Q/Q Percent Change	0.0	0.1	0.4	0.3	0.1	-0.5
Y/Y Percent Change	0.3	1.0	2.2	2.3	0.5	-0.5
Manufacturing Employment (000s)	1.0	103.3	449.0	230.3	231.8	47.7
Q/Q Percent Change	0.0	-0.3	0.4	0.1	0.0	-0.6
Y/Y Percent Change	0.0	-2.1	1.4	2.6	0.5	-1.8
Professional/Business Services Employment (000s)	157.9	424.8	576.1	255.0	679.8	67.2
Q/Q Percent Change	0.5	0.2	1.2	0.1	0.0	1.4
Y/Y Percent Change	0.9	1.9	4.9	4.8	0.3	3.4
Government Employment (000s)	233.9	503.8	716.5	357.2	707.3	152.7
Q/Q Percent Change	-0.5	0.0	0.0	0.4	0.3	-2.2
Y/Y Percent Change	-1.9	0.1	0.2	1.0	0.0	-1.3
Civilian Labor Force (000s)	379.2	3,103.7	4,627.5	2,197.0	4,236.4	784.7
Q/Q Percent Change	1.4	0.1	-0.1	0.8	-0.1	-0.8
Y/Y Percent Change	1.8	-0.3	-0.6	1.1	0.1	-1.4
Unemployment Rate (%)	7.8	5.7	6.0	6.5	5.0	6.4
Q2:14	7.8	5.8	6.3	6.2	5.2	6.7
Q3:13	8.5	6.4	7.5	7.3	5.5	6.5
Real Personal Income ($Bil)	46.3	303.2	363.7	164.6	380.4	62.5
Q/Q Percent Change	0.2	0.4	1.0	0.5	0.3	0.4
Y/Y Percent Change	1.8	2.0	2.4	2.7	1.1	1.7
Building Permits	2,095	5,209	14,278	7,027	7,346	651
Q/Q Percent Change	996.9	32.7	15.2	5.0	-5.0	26.7
Y/Y Percent Change	93.6	4.4	18.8	12.4	-8.9	5.5
House Price Index (1980=100)	703.1	427.0	314.6	317.5	413.3	225.2
Q/Q Percent Change	0.8	0.8	1.2	0.9	0.5	1.2
Y/Y Percent Change	8.0	3.5	3.5	3.9	3.3	2.2

Nonfarm Employment
Change From Prior Year
Third Quarter 2003 - Third Quarter 2014

4%
3%
2%
1%
0%
-1%
-2%
-3%
-4%
-5%
-6%

04 05 06 07 08 09 10 11 12 13 14
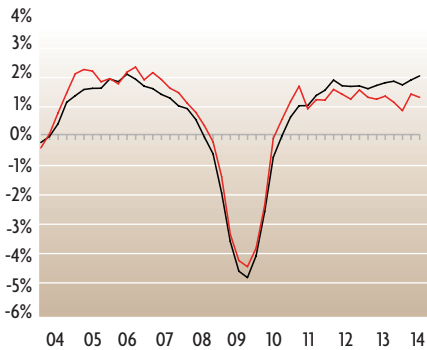
Unemployment Rate
Third Quarter 2003 - Third Quarter 2014

10%
9%
8%
7%
6%
5%
4%
3%

04 05 06 07 08 09 10 11 12 13 14
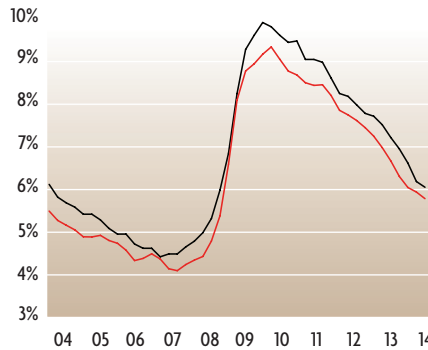
Real Personal Income
Change From Prior Year
Third Quarter 2003 - Third Quarter 2014

8%
7%
6%
5%
4%
3%
2%
1%
0%
-1%
-2%
-3%
-4%

04 05 06 07 08 09 10 11 12 13 14
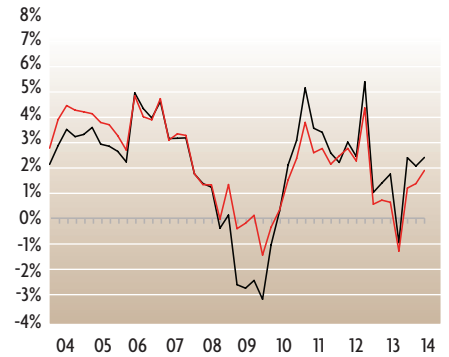
—— **Fifth District**   —— **United States**

Nonfarm Employment
Major Metro Areas
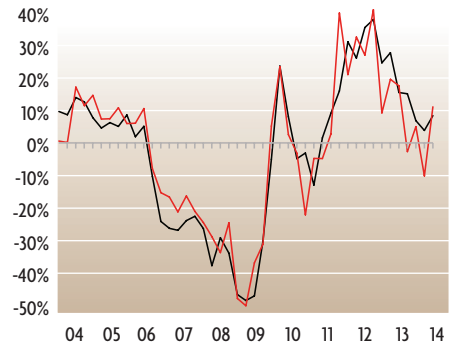**Change From Prior Year**
Third Quarter 2003 - Third Quarter 2014

7%
6%
5%
4%
3%
2%
1%
0%
-1%
-2%
-3%
-4%
-5%
-6%
-7%
-8%

04 05 06 07 08 09 10 11 12 13 14

—— **Charlotte**   —— **Baltimore**   —— **Washington**
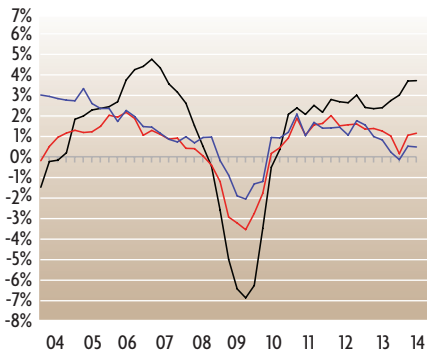
Unemployment Rate
Major Metro Areas
Change From Prior Year
Third Quarter 2003 - Third Quarter 2014

13%
12%
11%
10%
9%
8%
7%
6%
5%
4%
3%
2%
1%

04 05 06 07 08 09 10 11 12 13 14

—— **Charlotte**   —— **Baltimore**   —— **Washington**
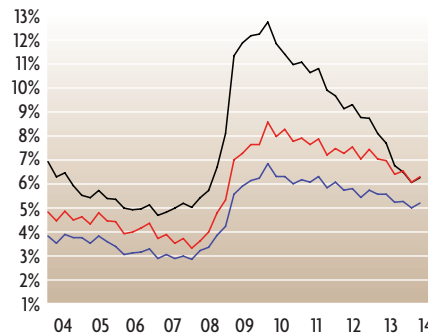
Building Permits
Change From Prior Year
Third Quarter 2003 - Third Quarter 2014

40%
30%
20%
10%
0%
-10%
-20%
-30%
-40%
-50%

04 05 06 07 08 09 10 11 12 13 14

—— **Fifth District**   —— **United States**

FRB—Richmond
Services Revenues Index
Third Quarter 2003 - Third Quarter 2014

40
30
20
10
0
-10
-20
-30

04 05 06 07 08 09 10 11 12 13 14
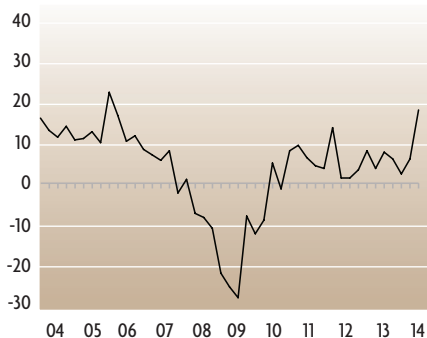
FRB—Richmond
Manufacturing Composite Index
Third Quarter 2003 - Third Quarter 2014

30
20
10
0
-10
-20
-30
-40
-50

04 05 06 07 08 09 10 11 12 13 14

House Prices
Change From Prior Year
Third Quarter 2003 - Third Quarter 2014

16%
14%
12%
10%
8%
6%
4%
2%
0%
-2%
-4%
-6%
-8%

04 05 06 07 08 09 10 11 12 13 14

—— **Fifth District**   —— **United States**

Metropolitan Area Data, Q3:14

	Washington, DC	Baltimore, MD	Hagerstown-Martinsburg, MD-WV
Nonfarm Employment (000s)	**2,536.3**	**1,347.2**	**103.1**
Q/Q Percent Change	-0.2	-0.3	0.1
Y/Y Percent Change	0.5	1.2	0.3
Unemployment Rate (%)	**5.1**	**6.1**	**6.0**
Q2:14	5.1	6.2	6.2
Q3:13	5.4	6.8	6.6
Building Permits	**7,223**	**2,189**	**282**
Q/Q Percent Change	35.3	26.8	36.2
Y/Y Percent Change	25.6	-8.9	8.9

	Asheville, NC	Charlotte, NC	Durham, NC
Nonfarm Employment (000s)	**176.9**	**1,060.8**	**290.8**
Q/Q Percent Change	-0.4	-0.5	-0.2
Y/Y Percent Change	1.5	3.8	2.9
Unemployment Rate (%)	**4.9**	**6.0**	**5.0**
Q2:14	4.9	6.2	5.0
Q3:13	6.0	7.6	5.9
Building Permits	**373.0**	**5,176**	**884**
Q/Q Percent Change	-6.0	44.1	8.3
Y/Y Percent Change	-10.8	77.8	-33.5

	Greensboro-High Point, NC	Raleigh, NC	Wilmington, NC
Nonfarm Employment (000s)	**346.2**	**562.5**	**116.6**
Q/Q Percent Change	-0.8	0.9	0.5
Y/Y Percent Change	0.9	3.6	3.4
Unemployment Rate (%)	**6.5**	**4.9**	**6.0**
Q2:14	6.7	5.0	6.2
Q3:13	8.1	6.0	7.5
Building Permits	**586**	**3,199**	**640**
Q/Q Percent Change	5.4	8.6	1.7
Y/Y Percent Change	-12.0	37.2	-30.3

	Winston-Salem, NC	Charleston, SC	Columbia, SC
Nonfarm Employment (000s)	**251.9**	**322.9**	**372.1**
Q/Q Percent Change	-0.6	-0.2	-0.4
Y/Y Percent Change	1.6	3.0	2.6
Unemployment Rate (%)	**5.9**	**5.7**	**6.1**
Q2:14	6.1	5.3	5.6
Q3:13	7.4	6.2	6.6
Building Permits	**688**	**1,264**	**1,330**
Q/Q Percent Change	25.5	-1.4	29.4
Y/Y Percent Change	14.5	-1.8	46.2

	Greenville, SC	Richmond, VA	Roanoke, VA
Nonfarm Employment (000s)	**387.3**	**631.5**	**160.0**
Q/Q Percent Change	-0.6	-0.2	-0.5
Y/Y Percent Change	1.9	1.5	0.7
Unemployment Rate (%)	**6.0**	**5.4**	**5.2**
Q2:14	5.5	5.6	5.3
Q3:13	6.6	5.9	5.7
Building Permits	**1,044**	**1,252**	**116**
Q/Q Percent Change	-28.3	-12.4	-16.5
Y/Y Percent Change	30.2	-22.7	6.4

	Virginia Beach-Norfolk, VA	Charleston, WV	Huntington, WV
Nonfarm Employment (000s)	**759.0**	**123.9**	**140.0**
Q/Q Percent Change	0.2	-0.5	-0.8
Y/Y Percent Change	0.1	-0.2	0.5
Unemployment Rate (%)	**5.6**	**6.3**	**6.4**
Q2:14	5.8	6.5	6.7
Q3:13	6.1	6.2	7.3
Building Permits	**1,242**	**6**	**34**
Q/Q Percent Change	-22.2	20.0	-8.1
Y/Y Percent Change	-50.3	-88.2	78.9

For more information, contact Jamie Feik at (804) 697-8927 or e-mail Jamie.Feik@rich.frb.org

Keeping Monetary Policy Constrained

BY JOHN A. WEINBERG

Some have proposed that the Fed follow a binding, explicit rule — a mathematical formula — to determine monetary policy. Such a prescription has even found its way into legislation introduced in Congress last year, with proponents arguing that it would enhance monetary policy transparency and accountability. Is this a good idea?

An early example of such a rule is one advanced by Milton Friedman in 1960, his "k-percent" rule, under which the Fed would choose a measure of the money supply and increase the money supply by a constant percentage every year. Several decades later, in 1993, Stanford University economist John Taylor proposed a somewhat more complex type of monetary policy rule, known as the Taylor rule. This type of rule more closely reflects the operations of modern central banks, which tend to conduct policy by setting a target for a short-term interest rate.

One purported benefit of adhering strictly to a rule is that it would make the Fed's actions more predictable, eliminating an unnecessary source of uncertainty in the economy and financial markets. Research has shown, for instance, that the uncertainty created by highly variable inflation can hurt the performance of the economy.

Committing to a fixed rule is also sometimes seen as a response to the so-called time consistency problem discussed by Edward Prescott and Finn Kydland, among others. A central bank might always perceive that a short-run gain in real economic activity can be had by producing a bit more inflation than the public expects. But acting on this temptation ultimately only leads to ever-higher inflation.

Yet when assessing the concept of a monetary policy rule, it is important to ask what we are comparing it to. During the 1960s and 1970s, Fed policy was indeed highly activist and discretionary. This period was marked by policymakers acting on a perceived trade-off between inflation and unemployment. The resulting economic performance was far from desirable, with volatile inflation that ratcheted up in each cycle.

For several decades now, as many observers have noted, the FOMC has instead operated as if it were pursuing an explicit inflation target. In this sense, the behavior of the Fed has already been broadly rule-like for some time, albeit with some exceptions. In fact, the Taylor rule began as an effort — a successful effort — to show that Fed monetary policy had been following a path described by that rule. Fed policy arguably continued to follow such a path until the 2007-2009 recession, when most Taylor-type rules began calling for negative interest rates.

In January 2012, the Fed's policy of constrained discretion again took a step in the direction of being rule-like. At that time, the Fed announced an explicit long-run inflation target of 2 percent. Since then, the Fed has continued to commit publicly to achieving this target and to addressing substantial departures from it with monetary action, if need be.

Why not take that final step, then, and adopt a formal rule such as Friedman's or Taylor's — and follow it strictly all the time?

I think the main answer is that while a monetary policy rule could be useful during normal times, we don't always live in normal times. In fact, if we think of "normal" as "average," then times are almost never normal. This might not matter if the economy's abnormal times always looked like its abnormal times of the past; in that case, we could write the rule to deal with them, too. As we know well from the financial crisis and its aftermath, however, this is not the case. As Leo Tolstoy wrote of unhappy families, each unhappy economic period is unhappy in its own way.

Thus, it is unlikely anyone could have constructed an autopilot prior to 2007 to steer the Fed through the ensuing recession and weak recovery. Nor is it plausible to think that monetary policy rules in existence today are necessarily sufficient to get us through the next crisis, whatever it may turn out to be. FOMC members will then need to draw upon lessons of history and theory and upon their own judgment.

Further, a formula like the Taylor rule embodies assumptions about underlying characteristics of the economy. Concepts like the potential rate of output growth or the natural rate of unemployment could affect one's view of what the exact rule is that the central bank should follow. These are theoretical concepts — they can have a precise meaning in an economic model but are not directly observable in the data. The process of discussing policy within the FOMC can in part revolve around the sorting out of different views about these "latent variables."

Monetary policy rules can serve a useful function within a regime of constrained discretion by helping the Fed communicate what it is doing and intends to do. But for the Fed to prescribe a policy rule for itself and to commit always to follow it, or for Congress to impose such a rule, could actually reduce rather than increase the Fed's credibility with markets — because market participants understand that a commitment never to vary from a monetary policy rule is a commitment that neither Congress nor the Fed could realistically keep.   **EF**

John A. Weinberg is senior vice president and special advisor to the president at the Federal Reserve Bank of Richmond.

NEXT ISSUE

Private Debt

In the run-up to the Great Recession, private debt as a share of GDP reached historic levels. Debt serves many useful economic functions, but research suggests that excessive debt can be harmful for the broader economy — for example, the most severe financial crises and slowest recoveries of the 20th and 21st centuries were preceded by large credit booms. Why do households and firms choose debt financing, and why might it be damaging during economic downturns?

Evaluating Medical Treatments

It's hard to put a price on an extra day or year of life. But many health care experts believe considering cost-effectiveness is crucial to lowering health care costs and improving patient care.

Smart Grid

Technology to enhance monitoring and communication across the electrical grid, called the "smart grid," enables utilities to charge prices that change as the cost of producing electricity fluctuates. Some economists believe such dynamic pricing could help reduce demand during peak usage times, leading to economic and environmental gains. But can the technology live up to expectations?

Jargon Alert

The "real" interest rate is the inflation-adjusted cost of borrowing and return on investment. It has taken on a broader significance in monetary policy, as some economists have argued that central banks should push real interest rates into negative territory when nominal interest rates are close to zero yet the economy remains weak.

Economic History

Development of Hilton Head Island transformed one of the poorest and most isolated corners of South Carolina into a haven for wealthy people from all over the world, creating a popular model for resort and residential development. How did it happen, and who benefited from this economic miracle?

Interview

James Poterba of the Massachusetts Institute of Technology on the shifting financial sands of retirement, the debate over the home mortgage interest deduction, and how MIT's economics department reached the top ranks after World War II.

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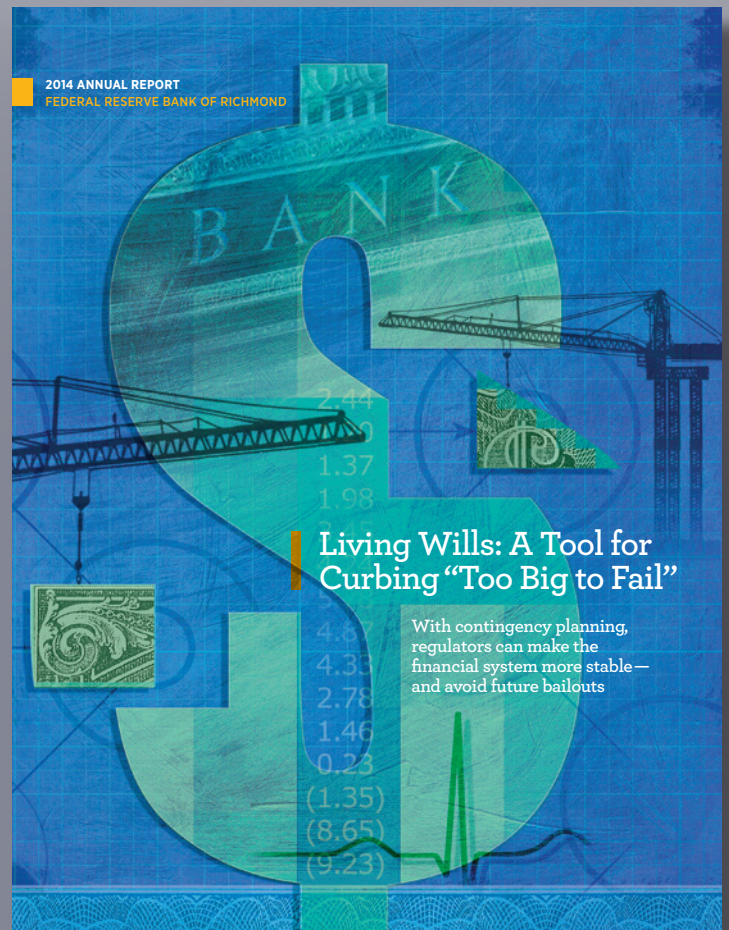- To request an email alert of our online issue postings

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The Richmond Fed's *2014 Annual Report* features the essay

Living Wills: A Tool for Curbing "Too Big to Fail"

In the essay, Richmond Fed economist Arantxa Jarque and senior editor David A. Price explore an innovation of the Dodd-Frank Act of 2010, which requires the largest and most complex financial institutions to create resolution plans to follow if the institutions fall into severe financial distress. In these plans, or "living wills," the institutions must give regulators a road map for resolving them via the bankruptcy process — without disrupting the financial system or resorting to public bailouts. Jarque and Price argue that living wills are a tool that regulators can use to curb the "too big to fail" problem by decreasing the odds that policymakers will feel compelled to rescue large, complex firms for fear that their failure would damage the economy.

In addition to the essay and the Bank's financial statements, the *Annual Report* includes a summary of the region's economic performance in 2014 and an update on activities by the Fed and the payments industry to improve the U.S. payments system.

2014 ANNUAL REPORT
FEDERAL RESERVE BANK OF RICHMOND

Living Wills: A Tool for Curbing "Too Big to Fail"

With contingency planning, regulators can make the financial system more stable— and avoid future bailouts

The Annual Report is available on the Bank's website at www.richmondfed.org/publications/research/annual_report/