

SECOND QUARTER 2014

ECON FOCUS

FEDERAL RESERVE BANK OF RICHMOND

CROWDED

**The Economic
Effects of
Population
Growth
(It's Not All Bad)**

Islamic
Banking

The Making of
Bar Codes

Interview with
Nicholas Bloom

ECON FOCUS

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Investing in People as an Economic Growth Strategy

It might not be obvious why the president of a Federal Reserve Bank would be interested in workforce development — what does it have to do with interest rates and inflation? But workforce development is intimately related to part of the Fed's legislative mandate, which is promoting maximum employment. That has proven to be a difficult task in the wake of the 2007-2009 recession, as I'm sure you are all too aware. This has led me and other policy-makers to ponder a difficult question: Given the limitations of monetary policy, what can be done to improve labor market outcomes in the long run?

At the Richmond Fed, our research suggests that much of what we're currently seeing in the labor market reflects structural trends rather than a primarily cyclical change in labor market behavior. That has prompted us to think about long-term strategies to prepare workers for the labor market. We've been thinking about workforce development at the level of the individual: What can be done to improve people's skills and adaptability, which economists call "human" capital?

To think about those strategies, it's helpful to begin in the early 1960s, when economists began seriously studying the forces and decisions that lead people to differ in their capabilities. They proposed thinking about knowledge and skills as simply another form of capital that makes workers productive, just like physical capital such as machines or computers. Workers acquire this human capital by making investments, such as attending school, getting on-the-job training, or even receiving medical care.

More recently, a consensus has developed that human capital is more than just the number of years spent in school or on the job. Research suggests that noncognitive skills — such as following instructions, patience, and work ethic — lay the foundation for mastering more complex cognitive skills and may be just as important a determinant of future labor market success. These basic emotional and social skills are learned very early in life, and it can be difficult for children who fall behind to catch up: Gaps in skills that are important for adult outcomes are observable by age 5 and tend to persist into adulthood.

What does the economics of human capital imply for workforce development programs? Several insights are especially relevant. First, it makes economic sense to concentrate intensive human capital investment in the form of formal schooling on the young: The earlier workers invest, the longer they have to profit from their investments. In addition, because earnings typically increase with age, young people attending school tend to sacrifice less by way of forgone earnings than older workers. Another key takeaway is that investments in early childhood can affect later decisions about formal schooling. If the foundations for learning are

laid very early, then even mild delays in acquiring noncognitive skills might make skill acquisition more challenging later in life; after all, why try as hard to get good grades, stay in high school, or enroll in college when those efforts might not pay off?

Human capital economics also implies that higher education should lead to higher future wages, both because education is costly to acquire and because it can elevate a person's productivity. Indeed, the data confirm that the payoff to education is quite high.

Just as this view of workforce development points toward investment early in life, it also points toward the challenges confronting later interventions. Asking adults to reinvent themselves in the face of a relatively short remaining working horizon, when early retirement and exiting the labor force become viable options, is asking a lot of both the workers and the workforce development professionals who train them. And, indeed, research suggests that workforce development efforts that focus solely on training or retraining adult workers might have only modest effects on employment and job retention.

Of course, this does not mean that adults cannot or should not learn new skills; I am deeply sympathetic to the plight of workers who have been laid off from jobs they performed admirably for decades, and I commend those who wish to complete or further their education. But we may need to be cautious about treating older workers' difficulties as remediable through training, when the appropriate course of action may actually involve greater use of the social safety net.

We may be able to help a large number of future workers, however, by expanding our focus and thinking about workforce development not as a cure for the short-term shocks that individuals may experience, but rather as a long-term vaccine that will protect them against future shocks. **EF**



JEFFREY M. LACKER
PRESIDENT
FEDERAL RESERVE BANK OF RICHMOND

This message was excerpted from a speech delivered June 26, 2014, and appears here as condensed by the *Washington Post* on July 14, 2014.

Coal Crunch

Massive Mining Layoffs Hit WV

During the summer of 2014, three major coal mining companies announced plans to lay off a total of 1,800 employees in West Virginia.

The largest announcements came from Bristol, Va.-based Alpha Natural Resources. In late July and early August, the company put 1,129 employees on notice at various subsidiaries in the southern half of the state, where mine productivity is low compared with other U.S. coal-producing regions.

The company cited several reasons for reducing its West Virginia operations, including persistently weak demand for coal, competition from lower-cost operators in other regions, competition from natural gas as an alternative to coal for power generation, and new regulations from the Environmental Protection Agency.

(For more on the prospects for West Virginia coal, see “The Future of Coal,” *Econ Focus*, Fourth Quarter 2013.)

“EPA’s new MATS (mercury and air toxics standards) air emissions rule alone is expected to take more coal-fired power generation offline next year than in the previous three years combined,” the company predicted. “Much of that is in markets historically supplied by Central Appalachian mines.”

Other major layoff announcements during the summer came from Cliffs Natural Resources of Cleveland (397 employees) and Coal River Energy of Alum Creek, W.Va. (280 workers). Coal River Energy blamed its pending layoffs on “weak coal demand and government regulations,” while Cliffs Natural Resources cited poor market conditions for metallurgical coal (coal used to make steel).

The summer’s total number of announced layoffs represents 9.5 percent of the state’s jobs in coal mining and coal mining support, but the industry’s employment will not decline 9.5 percent because hiring will offset some of the layoffs. The net loss of jobs during the past two years, however, has accelerated a downward trend that began in 2012. Coal mining employment in West Virginia, including support positions, has plummeted from an 18-year high of 24,928 jobs in 2011 to a 10-year low of 19,040 jobs in the first quarter of 2014. The most recent wave of layoff announcements suggests that the number will continue to decline rapidly for at least the rest of the year.

—KARL RHODES



Open-pit mining in Wyoming is far more efficient than underground mining in West Virginia.

PHOTOGRAPHY: UNITED MINE WORKERS OF AMERICA

In for a Dollar

Discount stores engage in a high-price bidding war

The Charlotte area-based retailer Family Dollar has been targeted for takeover by two of its competitors. In July, the company announced it was being acquired by Dollar Tree, which is headquartered in Chesapeake, Va., for \$8.5 billion, or \$74.50 per share. In August, rival Dollar General offered to pay \$78.50 per share, an offer that Family Dollar’s board of directors rejected on the grounds that the Federal Trade Commission (FTC) would be unlikely to approve the deal. Dollar General upped its bid to \$80 per share, or \$9.1 billion, but Family Dollar spurned that offer as well. On Sept. 10, five days after being rebuffed the second time, Dollar General launched a hostile take-

over bid. Family Dollar’s board is recommending that shareholders reject Dollar General’s tender offer. The shareholder vote is scheduled for December 11.

The three chains are the major players in the “super discount” retail sector, which grew significantly during the Great Recession and has continued to expand. Dollar General is the largest of the three, with more than 11,000 stores in 40 states. Family Dollar has about 8,000 locations, and Dollar Tree has about 5,000 locations in the United States and Canada. By comparison, Wal-Mart has around 4,200 U.S. locations.

Despite the moniker “dollar store,” both Family Dollar and Dollar General sell goods at a range of

prices, and Family Dollar says that proximity to a Dollar General is a major factor in its pricing decisions. According to Family Dollar's board of directors, it's thus likely the FTC would block the deal on antitrust grounds, or at the very least require a protracted review process. "The government wants to prevent mergers that transform the structure of a market in a way that raises prices and thus injures consumers in that market," says Alan Meese, an antitrust expert at William & Mary Law School and former antitrust litigator.

Invoking antitrust concerns is a common tactic for companies that don't want to be bought, according to Meese. "Raising antitrust concerns to thwart a more generous bid can raise suspicions about the motives of the target's board." Still, the Dollar Tree deal may be more likely to pass muster with the FTC; Dollar Tree caps its prices at \$1 and has promised to divest itself of as many stores as necessary to win regulatory approval. Dollar General has agreed to sell up to 1,500 stores, but so far it is unwilling to promise more. "In this context Family Dollar's directors have a fiduciary duty to obtain the best deal for shareholders," says Meese. "If they

have a well-informed good faith belief that the FTC will block the more lucrative transaction, they should recommend shareholders approve the sure thing."

Just how much monopoly power a combined Dollar General-Family Dollar would actually be able to exercise depends on how the relevant market is defined. The dollar stores' \$48 billion market is only a tiny slice of the total market for fast-moving consumer goods, such as groceries and toiletries; Walmart's U.S. sales alone were more than \$279 billion in fiscal year 2014. And an analysis of shopping data for about 80,000 households by the company InfoScout suggests that consumers have plenty of other options. In any given month, nearly 93 percent of households also shopped at a supercenter such as Walmart or Target, and when asked, 81 percent of Family Dollar shoppers said Walmart was a good substitute for Family Dollar.

Regardless of which company ultimately wins over Family Dollar's shareholders, the deal will come under close FTC scrutiny to ensure that consumers can stretch their dollars as far as they did before.

—JESSIE ROMERO

It's All Business

NC expands the role of its business court with new law

North Carolina's business court has been in existence since 1995, but it recently got quite the facelift. On Aug. 6, Gov. Pat McCrory signed into law an act aimed at modernizing and streamlining the state's specialized business court. Proponents believe these changes will make the state more business-friendly by establishing clear precedents and definitive case law.

Business courts are specialized courts that hear only designated business cases. They currently exist in varying forms in 20 states, with Delaware's Court of Chancery being the longest-running and most prestigious.

But the makeup of business courts differs greatly from state to state in several respects. For instance, North Carolina and Delaware have specialized business courts, while some other states only have business divisions within their existing general courts; some business courts are statewide and some are limited to metro areas, such as Pittsburgh and Chicago; and the criteria for qualifying for business court is different in every location. Despite this wide variety, each state with a business court system generally creates it with the goal of improving efficiency and predictability in business litigation.

The new North Carolina law was spearheaded by Republican state senators Tamara Barringer and Bob Rucho, who told the *Charlotte News & Observer* in June that their goal was to enhance the existing court and "make the state more attractive to businesses, including

out-of-state companies looking to relocate."

One of the ways that North Carolina hopes the law will help it to compete is through new rules on holding company reorganizations — that is, when a new corporation becomes the sole shareholder of an existing corporation through a merger. In a page taken from Delaware's playbook, an entirely new section was added that permits holding companies to reorganize without shareholder approval as long as certain requirements are met. Once the merger is complete, the shareholders will maintain the same rights in the new holding company.

Other sections in the law deal directly with the operation of the business court. Business court appeals will now go directly to the state Supreme Court, rather than through the Court of Appeals. The law also creates a category of mandatory complex business cases that are required to be tried in business court: Cases valued at more than \$5 million involving corporate law, intellectual property law, and certain other areas fall under this designation, as do business contract disputes worth more than \$1 million when all parties consent to the designation.

While the law does not create any new judgeships, the 2014 Appropriations Act does call for two new business court judges in 2015, bringing the total to five.

The updated law applies only to cases brought to the court after Oct. 1, 2014, and most provisions of the new law went into effect on this date.

—LISA KENNEY

Will the Graying of America Change Monetary Policy?

BY DAVID A. PRICE

Economists ponder whether demographic change will reduce the potency of the Fed's interest rate moves

America, like many industrialized countries, is aging. The Census Bureau projects that by 2030, over 20 percent of U.S. residents will be 65 or older, up from 13 percent in 2010 and less than 10 percent in 1970. For elder-law attorneys and hearing-aid companies, the economic implications of this trend are more or less obvious. For fiscal policymakers, especially with regard to programs like Social Security and Medicare, the implications are also obvious — although the precise extent of the effect is up for debate. But what are the trend's implications for monetary policy?

Despite the certainty of the oncoming demographic change, little is known about how it is likely to affect the Fed's policy tools. Some policymakers and observers have expressed concern, however, that the Fed's ability to stimulate the economy may decline for demographic reasons, if it hasn't already done so. For example, New York Fed President William Dudley suggested in a 2012 speech that “demographic factors have played a role in restraining the recovery,” in part because spending by older Americans is “less likely to be easily stimulated by monetary policy.”

If the contentions of some economists are correct, the aging trend will affect asset markets in ways that will influence how the Fed conducts monetary policy, perhaps forcing the Fed to make bigger interest rate changes for the same amount of stimulus or tightening it wishes to apply to the economy. It could also lead the Fed to resort more frequently to unconventional tools such as massive purchases of assets — the so-called “quantitative easing” in which the Fed engaged after the Great Recession.

An Aging America

America's aging trend reflects several distinct causes. The most famous of them, the baby boom, is the jump in fertility that took place following World War II and continued for 18 years. Birth rates during this period ranged from 24 to 26.5 per 1,000 people in the population, compared with 18 to 19 per 1,000 people during the Great Depression years leading up to the war. The term “baby boomer” commonly refers to people born in the United States from 1946 to 1964, when birth rates finally fell to their pre-boom levels.

The baby boom wasn't America's first postwar birth boom — a brief, shallow one took place during the two years following World War I — nor was it a historical peak in U.S. birth rates. What has made it a powerful driver of today's aging trend is partly the sheer number of baby boomers who were born in its long duration, some 72.5 million in all.

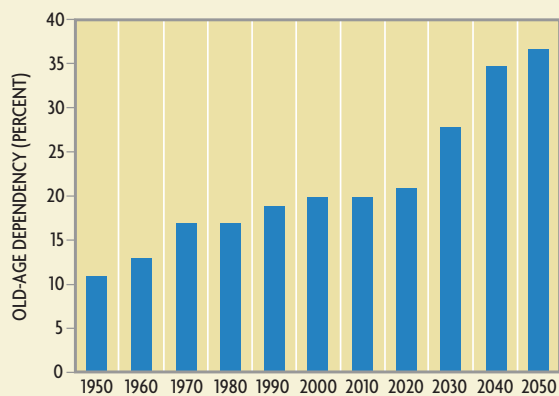
Another reason for the aging trend is the pattern of U.S. birth rates in the 50 years since the end of the baby boom. During that time, birth rates never returned to even the lowest levels of the baby-boom years. They have hovered around 15 per 1,000 people since the early 1970s, declining further with the 2007-2009 recession. In 2012, the latest year for which data is available, the rate was down to 12.6 per 1,000.

Combined with the declines in birth rates are the increases in our life expectancies, from 47.3 years in 1900 to 68.4 years in 1950 and 78.2 years in 2010.

While America is aging, it is far from alone in doing so. The other large developed countries are generally older. In 2012, the populations of Germany, Italy, and Japan were at least one-fifth seniors aged 65 or older, a level that the United States is not expected to reach for decades.

To be sure, population forecasting is not foolproof. John Maynard Keynes asserted in a 1937 speech before the

America's Aging



NOTE: The Census Bureau defines the old-age dependency ratio as the population aged 65 and over as a percentage of the population aged 18 to 64. SOURCE: U.S. Census Bureau, *An Aging Nation: The Older Population in the United States* (2014)

Eugenics Society that Britain would soon face “a stationary or declining level” of population — a prediction he made on the eve of that country’s wartime and postwar baby booms. In the case of the present-day United States, one of the variables that will affect the age structure of the population is the course of future immigration. Still, given the size of the baby-boomer pig moving through America’s demographic python, there is little debate that America will be getting older.

Defanging the Fed

People’s patterns of consumption and savings tend to vary in predictable ways as they get older. That’s according to the “life cycle hypothesis,” originated in the early 1950s by Franco Modigliani, then an economics professor at Carnegie Mellon University, and Richard Brumberg, a graduate student at Johns Hopkins University. The basic idea is simple: Individuals try to smooth out their consumption over their lifetimes by borrowing when they are young adults, building up savings as their incomes increase during their working years, and drawing down their savings after they retire.

For economists studying the effect of demographic change on financial markets, the ages 40 to 64 are often considered the asset-accumulating years. Some economists have argued that the long-term upward trends of recent decades in the stock market and housing markets have been driven in part by the rise of the baby boomers. Indeed, since the late 1980s, a number of economists, starting with Greg Mankiw of Harvard University and David Weil of Brown University, have suggested that the influence of life cycle effects may lead to declining house prices as the baby boomers leave their asset-accumulating years behind.

One aspect of the life-cycle effect with implications for monetary policy is that older households tend to hold less debt as a fraction of net worth, which could work to reduce the sensitivity of their consumption to interest rates. “A change in interest rates on a large sum of debt implies higher interest payments,” International Monetary Fund (IMF) economist Patrick Imam said in an email. “Therefore, younger households have to cut their expenditure much more to pay the higher interest payments than older households, and vice versa if interest rates go down.”

Another life-cycle effect that could dampen the influence of monetary policy is the assumed tendency of older individuals to be more risk-averse in their investments than younger ones, in line with the common advice of financial writers and advisers to shift assets into less risky investment categories as one ages. Such risk-aversion by a growing population of older investors could create headwinds for the Fed because its low-interest-rate policies get some of their effectiveness from a “risk-taking” channel of monetary policy: that is, the tendency of some investors in a low-interest-rate environment to reduce their holdings of safe assets such as Treasuries in favor of riskier assets such as stocks and high-yield bonds, a process sometimes known as a search for yield. But that effect works only if people actually take greater risks in response to easier monetary policy, and some econo-

mists believe that older households may be less willing to do so. In this view, the less risky the investments that investors move into in response to low Fed policy rates — if they move their money at all — the less stimulus to economic activity through the risk-taking channel of monetary policy.

“Financial entities and households have been found to take more risk by borrowing more and investing in riskier assets when interest rates fall and less when interest rates rise,” Imam said. “Older people, who are more risk-averse — as they cannot easily make up for losses — may be less sensitive to the ‘search for yield’ effect than younger ones. Elderly households would not want to invest as much in risky sectors, thereby not allowing those sectors to take off on a large scale.”

Into The Gray Unknown

Yet a number of complicating factors leave it unclear how much the Fed’s policy tools will be weakened, or even whether they will be significantly affected at all. As it turns out, households don’t seem to dissave as much in retirement as the classic life-cycle hypothesis predicts. Despite the theory, moreover, households increasingly keep borrowing even in their later years.

“We have seen in the last couple of decades, as households have refinanced mortgages in midlife into their 50s and sometimes even 60s, more households reaching traditional retirement age with mortgage debt on the books,” says Massachusetts Institute of Technology economist James Poterba, who has studied the effect of aging on financial markets. “The days of people borrowing when they were 32, paying off the mortgage when they were 62, and burning their mortgage have become fewer and fewer as more people have refinanced.”

The risk-taking channel also doesn’t seem to behave entirely in accord with the predictions of theory, Poterba notes: The Fed’s Survey of Consumer Finances indicates that older households continue to hold risky assets, such as stocks, in significant amounts. “Even at the traditional retirement age of 65, the typical household has quite a number of years left that it needs to draw its resources down over,” Poterba says. “There probably is some shift toward less risk appetite in those older years, but people don’t hit retirement and say they don’t want risky assets anymore.”

A further complicating factor is that in an increasingly open global economy, financial assets can cross borders. Countries are not aging in lockstep: For example, China, Japan, and continental Europe are aging faster than the United States, which, in turn, is aging faster than many emerging-market economies. In theory, to the extent that changing demographics leads to changes in asset prices and returns, investors in aging, lower-return markets can be expected to move their assets to younger economies in pursuit of higher returns, somewhat muting the effects on asset markets of demographic shifts within a country. But the extent to which such movements would offset the influence of demographics on the effectiveness of monetary policy is unclear.

“Our ability to model these cross-border macroeconomic effects is still very inadequate,” says Brookings Institution economist Ralph Bryant. “There are miles and miles to go before we are in a better place to generate reliable conclusions about effects on policy.”

Finally, there is another channel through which life-cycle behavior may affect the power of monetary policy — a wealth effect that pushes in the opposite direction as the effect on consumption by the young, possibly amplifying the influence of interest-rate changes. A more familiar example of a wealth effect is the effect on a household’s financial behavior when it enjoys significant appreciation of its house, an increase in its wealth that may lead it to spend more. In the context of life-cycle behavior and monetary policy, the idea is that although many older households are cash-strapped, older households as a group tend to be wealthier than the young and hold more financial assets. Older households, therefore, are likely to be more exposed to the effect of interest-rate changes on financial assets through changes in their wealth. In an older society, that effect may increase the responsiveness of the household sector as a whole to monetary policy.

Which effects will prevail? It’s challenging to reach firm empirical conclusions in this area because demographic change is slow. One such effort, by Imam of the IMF, studied the effect of monetary policy shocks on inflation and unemployment in the United States, Canada, Japan, the United Kingdom, and Germany and found that their effect has decreased over time. Imam further looked at whether this effect was associated with the timing of the aging of those societies and found “quite a strong negative long-run effect of the aging of the population on the effectiveness of monetary policy.” Imam estimated the change that a 1 percentage point increase in the old-age dependency ratio — the ratio of people older than 64 to those of traditional working age — would make in the effectiveness of a 1 percentage point shock to interest rates by monetary policymakers. He determined that a 1 percentage point increase in the old-age dependency ratio reduces the effect of such an interest-rate change on inflation by 0.1 percentage point and its effect on the unemployment rate by 0.35 percentage point.

The Census Bureau estimates that the old-age dependency ratio in the United States will rise by 14 percentage points from 2010 to 2030. If Imam’s estimates and the Census Bureau’s estimates were to hold, they would imply a 1.4 percentage point drop in the Fed’s ability to affect

inflation and a 4.9 percentage point drop in its ability to affect unemployment. Over the course of a 20-year period, such a change might be perceived as modest from one year to another, but cumulatively it would amount to a strong negative effect indeed.

Higher Expectations

If such a scenario occurred, the Fed would need to use its policy tools in an increasingly aggressive way to achieve the same results. In addition, any downward push from demographics on the Fed’s influence would increase the chances that it will one day have to grapple again with the zero lower bound — the assumed inability of monetary policy to reduce nominal short-term interest rates below zero. This limitation has led to the use of some unconventional monetary policy tools since the Great Recession, most notably quantitative easing. Because quantitative easing enables the Fed to add further monetary stimulus to the economy even when interest rates are at or near zero, it is possible that the ship QE would sail more often in the future.

Demographic change would also affect Fed policy in other ways. The fact that the elderly are more likely to be out of the labor market would probably have ripple effects on other features of the economy that Fed officials look at to determine monetary policy, such as the natural rate of unemployment (that is, the lowest level of unemployment that the economy can maintain in the long run).

An older society may also bring the Fed a somewhat different set of political pressures. The disproportionate absence of the elderly from the labor force would tend to lead them to be more concerned about the Fed’s inflation mandate than its employment mandate. Charles Bean, former deputy governor of the Bank of England and its chief economist before then, suggested in a 2004 speech that aging may affect central banks by increasing the constituency for low inflation in another way, as well. Given the higher asset holdings of an older cohort, he predicted, with more of its wealth in bonds than stocks, an older society will tend to favor low-inflation policies (to the extent that bond holdings of seniors are not inflation-protected). At the same time, Bean said, with the decline of defined-benefit pensions, an older society will expect more from its central bank in preventing falls in asset prices.

While the effects of aging on monetary policies are uncertain for now, one prediction can be made with confidence: We won’t be getting any younger. **EF**

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Accounting for the Vagaries of the Wind

BY TIM SABLİK

On April 29, the U.S. Supreme Court upheld the Environmental Protection Agency's Cross-State Air Pollution Rule (commonly called the Transport Rule), the agency's third attempt in two decades to address the "Good Neighbor" provision of the Clean Air Act. That provision poses a tricky puzzle for regulators, requiring them to prohibit air pollutants emitted by sources in one state from "significantly" interfering with the ability of a downwind state to meet clean air standards.

The Transport Rule applies to 27 states in the eastern half of the United States that were found to have contributed at least 1 percent of sulfur dioxide (SO₂) and nitrogen oxides (NO_x) pollution to at least one downwind state. These upwind states were given an "emissions budget" for the pollutants, which took into account the cost effectiveness of implementing pollution controls within each state. A number of affected upwind states and power companies challenged the Transport Rule in the U.S. Court of Appeals for the D.C. Circuit. They argued, among other things, that the EPA's use of cost-effectiveness as a guide for pollution reduction would require some states clean up more than their "fair share" of downwind pollution.

In the case, *Environmental Protection Agency v. EME Homer City Generation*, the Supreme Court ruled that the EPA's cost-based approach was an "efficient and equitable solution" to the problem of cross-state pollution. Justice Ruth Bader Ginsburg, who delivered the majority opinion, noted that assigning blame to each state proportionally would require regulators to "account for the vagaries of the wind" — a nigh impossible task. For example, West Virginia contributes significantly to air pollution in a dozen states, and it receives pollution from about half a dozen.

This challenge is a classic example of what economists call a negative externality. The costs of a polluting coal-burning power plant, for instance, are not fully borne by the residents who receive its electricity because some pollutants blow downwind and damage residents in other states. This can artificially lower the price of the plant's electricity, leading to overproduction of both the electricity and the pollution byproduct.

There are a variety of ways to address such externalities. One proposed by early 20th century English economist Arthur Pigou is to place a tax on the polluter equal to the cost of the externality, thus requiring producers to account for the full cost of their products. Determining the right tax level is the challenge. Making the tax too low would fail

to fully address the externality problem, and setting it too high would be costly and inefficient. Expecting regulators to determine the proper level may be unrealistic.

In light of this, Nobel prize-winning economist Ronald Coase proposed an alternative solution. In his famous 1960 paper "The Problem of Social Cost," he argued that externalities should be viewed simply as a market transaction. As with any transaction, externalities involve two sides: the producer of the externality and the recipient. As long as property rights were well-defined and transaction costs were minimal, both parties could negotiate an efficient solution to the problem. For example, if it were cheaper for

downwind residents to pay a factory to stop polluting than to accept the pollution or relocate themselves, they would do so, and vice versa. In either case, the externality would be mitigated efficiently.

The EPA's Transport Rule incorporates some of Coase's insights by using cost-effectiveness to determine pollution limits. But by making those determinations itself, the agency has

opened itself up to criticism from some states that may have to clean up more than their share of downwind pollution if that is the most cost-effective option. "Most economists are going to say that the least-cost sources of pollution should be cleaned up first," says John Whitehead, chair of the department of economics at Appalachian State University. "But it's hard to argue with the fact this approach might not turn out as fair as some people would like."

In the case of other pollutants, such as carbon dioxide (CO₂), states have established regional pollution credit markets to facilitate the negotiation envisioned by Coase. The first of these programs, the Regional Greenhouse Gas Initiative, covers northeastern states from Maryland to Maine. Polluting factories in these regions can either reduce their pollution to comply with environmental mandates or purchase offset credits from other factories, ensuring that overall pollution is reduced efficiently. Whitehead says a similar approach for SO₂ and NO_x would be optimal, and the EPA's Transport Rule does allow states to adopt this solution. Unlike harm from CO₂, however, the damage caused by SO₂ and NO_x varies by distance traveled, making it harder to price pollution credits in a regional market.

This summer the EPA filed to lift the stay on the Transport Rule in light of the Supreme Court's decision, and the U.S. Court of Appeals for the D.C. Circuit granted that request on Oct. 23. Other challenges to the rule remain, however, and are scheduled for hearings through early 2015. **EF**

The costs of a polluting coal-burning power plant, for instance, are not fully borne by the residents who receive its electricity because some pollutants blow downwind and damage residents in other states.

Adverse Selection

BY KARL RHODES

Democrats and Republicans passionately disagree about the pros and cons of the Patient Protection and Affordable Care Act (ACA). But even the most partisan policymakers can agree that the ACA debate has brought a somewhat obscure economics concept — adverse selection — into popular parlance.

In the market for individual health insurance, adverse selection refers to the fact that, all else being equal, sick people are more likely to purchase health insurance than healthy people. In many cases, health insurers cannot observe the difference between sick people and healthy people. Prior to implementation of the ACA, many insurers required customers to disclose extensive details about their health status. Insurers then used this information to screen applicants and set premiums.

Under the ACA, however, health insurers can set premiums only on the basis of age, which is a rough proxy for health status. They can charge older people up to three times more than younger people, but even this price difference is not enough to cover the cost difference between the average 64-year-old and the average 21-year-old. So if insurance plans within an ACA exchange fail to attract sufficient shares of young people, they might have to raise premiums for everyone, which would make it even harder to attract and retain young people. This could result in an adverse selection “death spiral.”

Adverse selection occurs whenever asymmetrical information — information known to one party but not the other — makes it difficult for potential trading partners to distinguish between high-risk and low-risk transactions. This problem is particularly endemic to insurance markets. Without underwriting safeguards, for example, people could delay buying homeowners’ insurance until their houses are on fire. Likewise, people could postpone purchasing life insurance until they are terminally ill. If insurance companies unwittingly assumed such risks, the resulting claims would drive up the cost of insurance for everyone.

Adverse selection is most commonly studied in the context of insurance, but it applies to many other markets. For example, a restaurant owner in Charlottesville, Va., decided to replace his individually priced entrées with an all-you-can-eat buffet. He expected a certain amount of adverse selection — people with bigger appetites would be more likely to select his restaurant — so he priced the buffet higher than the entrées on his old menu. The owner was not surprised

by the copious quantities that his new customers consumed, but he was shocked by the massive amounts they wasted. Rather than risking a death spiral by raising the buffet price, the owner added a surcharge for customers who did not clean their plates.

Another hotbed for adverse selection is the used-car market. In 1970, economist George Akerlof made that connection in a *Quarterly Journal of Economics* article, “The Market for ‘Lemons.’” He noted that as soon as a car’s owner learns whether it is a lemon or not, “an asymmetry in available information has developed.” Based on this premise, Akerlof modeled a used-car market in which all cars have the same price because buyers cannot discern between good risks and bad risks. If a car is a lemon, its owner will sell it because the market price exceeds the car’s true value, but if the car is good, its owner will keep it because the market price falls short of the car’s true value. When sellers know the quality of individual cars and buyers know only the average quality

of all the cars, the market sputters like a 1970 Gremlin. But when buyers and sellers are able to discern the quality of individual cars, the market purrs like a late-model Honda.

Flexible prices based on symmetrical information would guard against adverse selection, but as noted above, the ACA prevents health insurers from discriminating on the basis of health status. So they use age as a rough proxy for health status as they attempt to set premiums that are competitive and profitable.

In December 2013, a Kaiser Family Foundation study estimated that young people (ages 18-34) comprise 40 percent of the potential market for ACA insurance exchanges. And at the end of the first open-enrollment period, 28 percent of enrollees were from that age group. That share is only 3 percentage points better than the Kaiser study’s worst-case scenario, but the national percentage is not as important as the share of young people joining each exchange. As of late April, the District of Columbia’s exchange ranked first with 45 percent. Utah was a distant second with 33 percent, and West Virginia was last with 19 percent.

No one knows what percentage would signal a death spiral, but a report from the National Association of Insurance Commissioners emphasized that states must be vigilant against adverse selection under the ACA. The report warned that “if the market outside of the exchange is perceived as more attractive to younger and healthier people, the exchange could become a ‘risk magnet’ and will ultimately fail.” **EF**



ILLUSTRATION: TIMOTHY COOK

RESEARCH SPOTLIGHT

Benefits of B.A. Alternatives

BY WENDY MORRISON

In recent years, the pursuit of a bachelor's degree has become as common a part of rhetoric about the "American Dream" as homeownership. Indeed, many point to the estimated \$1 million additional lifetime earnings of those who complete a traditional bachelor's degree, a figure made famous by a 2012 report from the Census Bureau, as evidence that college is likely a good bet for everyone. In addition to research on the returns to bachelor's degrees, there has been a substantial amount of research on the benefits of associate's degrees, which are often considered similar to the first two years of a four-year college curriculum. The results generally find substantial earnings increases linked to associate's degrees, as much as 24 percent for men and 31 percent for women.

Research looking at the value of a bachelor's degree or an associate's degree has generally measured the value of the degree relative only to that of high school completion, however. The literature has said little, if anything, about alternate forms of tertiary education like diplomas and certificate programs from community and technical colleges, despite more people receiving such diplomas and certificates every year than associate's degrees. In a recent *Journal of Labor Economics* article, Christopher Jepsen of University College Dublin, Kenneth Troske of the University of Kentucky and the Institute for the Study of Labor, and Paul Coomes of the University of Louisville attempt to fill this empirical gap by providing one of the first rigorous estimates of the labor market returns to community college diplomas and certificates.

Unlike associate's degrees, diplomas and certificates typically require significantly fewer credit hours to complete and are primarily awarded in technical programs. According to the authors, the few studies of the effects of certificates that do exist offer inconclusive evidence and often rely on small, unreliable samples. The authors use detailed administrative data on individuals within the Kentucky Community and Technical College System, which provides the ability to control for a variety of variables that might affect employment outcomes, such as employment experience, individual aspiration, innate ability, and race/ethnicity. Additionally, the authors believe that the richness of the data and the similarities among community college systems around the country make their findings more broadly applicable.

The authors use a traditional "fixed-effects" human capital model in order to discern the causal effects of

different award attainments on average quarterly earnings. In other words, the model measures the effect of the award on the earnings of the individual student as compared with his earnings before obtaining the award. They measure the variation in individual earnings over time, as well as the variation between individuals, in order to capture the full effect of attaining each award. In addition to controlling for demographic variables like age and sex, the authors attempt to compare outcomes for individuals with similar anticipated earnings trajectories by capturing differences based on a student's initial aspirations and age.

The authors find substantial labor market gains associated with associate's degrees and diplomas, and more modest gains associated with certificates, whose returns varied highly among fields. One trend that characterized all the results was that awards had larger positive effects on the average earnings of female students than on those of male students. Men who pursued associate's degrees

earned an additional \$1,484 on average, whereas women earned an additional \$2,363 on average. Average quarterly earnings increases associated with diplomas were comparable to associate's degrees, at \$1,265 for men and \$1,914 for women. Certificates were associated with a more modest but still positive

effect of around \$300 on average for both men and women. Income gains associated with certificates were more highly variable than gains for associate's degrees and diplomas, and they were the largest by far for men who entered vocational programs such as electrician and mechanic training and women who entered programs in health. Based on the results of a sensitivity analysis, the authors find that their results are indeed robust and speculate that the similarity between community and technical college programs across the United States means that their findings can be considered representative of analogous programs around the country.

These results suggest that human capital investments in alternate forms of tertiary education in technical and vocational fields have substantial labor market returns. Judging from the relative scarcity of economic literature on the effect of these programs and the longtime focus of policymakers on four-year degrees, further study of the benefits of these alternatives may be warranted. Such research may become increasingly relevant as the conventional wisdom on the value of bachelor's degrees is called into question amid rising tuition costs and rising levels of student loan debt. **EF**

"The Labor-Market Returns to Community College Degrees, Diplomas, and Certificates." Christopher Jepsen, Kenneth Troske, and Paul Coomes. *Journal of Labor Economics*, January 2014, vol. 32, no. 1, pp. 95-121.



CROWDED

While more is not always merrier, population growth over the last century has had many positive effects

BY TIM SABLİK

The 1973 science-fiction film *Soylent Green* may be best remembered for Charlton Heston's line about the titular food source: "Soylent Green is people!" The story takes place in the year 2022, when severe overpopulation has exhausted nearly all natural resources and people scrape by in hot, dirty, crowded cities. Outside of theater walls, that future seemed even more imminent. In 1968, American biologist Paul Ehrlich published *The Population Bomb*, which opened with the prediction that "a minimum of ten million people, most of them children, will starve to death during each year of the 1970s." In 1973, then-president of the World Bank Robert McNamara declared that "the threat of unmanageable population pressures is much like the threat of nuclear war."

LEE YIU TUNG / SHUTTERSTOCK

Why were Ehrlich, McNamara, and others so worried? In the last two centuries, world population underwent a previously unimaginable growth spurt (see chart). It took roughly 200 years for the population to double from 500 million in the 17th century to 1 billion around 1830. But within 100 years it had doubled to 2 billion, and then it doubled again by the mid-1970s — less than 50 years. This geometric growth, coupled with apparent resource shortages like the oil crises of the 1970s, alarmed both scientists and the public.

After releasing his book, Ehrlich co-founded the group Zero Population Growth to advocate reducing fertility rates to replacement level (slightly more births on average than deaths) either voluntarily or by government coercion if necessary. Indeed, some countries enacted extreme measures during this time to limit their population growth. In 1970, China's fertility rate was 5.5 children per woman, and government officials feared that the population would soon overrun available resources. They began encouraging citizens to marry later, postpone having children, and have fewer children. This culminated in the announcement of the "one-child policy" in 1980, restricting most couples to one child with the goal of reducing China's population growth rate to zero by 2000.

Today, China's fertility rate is 1.6, and it is confronting a different problem: rapid population aging. Nearly 10 percent of the population is over the age of 65, and that is expected to more than double by 2045. Late last year, China's government announced a change to the one-child policy: Couples in which at least one parent is an only child are allowed to have two children.

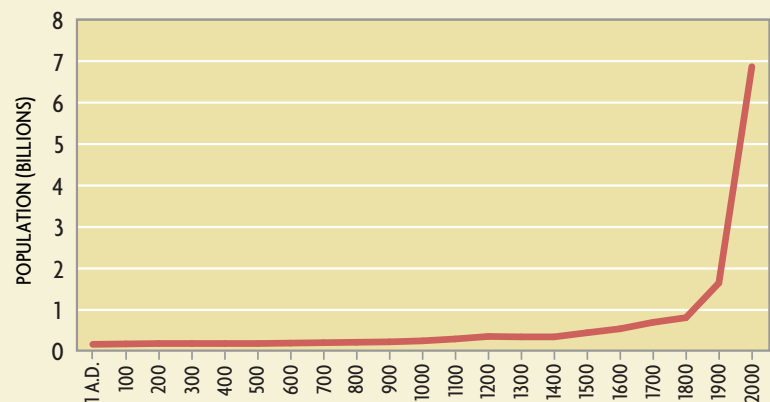
Other developed nations are facing similar demographic shifts (see chart on next page). According to an August report from Moody's Investors Service, the number of countries in which at least a fifth of the population is older than 65 will jump from three to 13 by 2020. Swelling retiree ranks are expected to strain tax-funded pension and health care programs, potentially slowing economic growth. In a July report, the Organization for Economic Co-operation and Development projected global economic growth will slow from 3.6 percent to 2.4 percent over the next 50 years, in part due to aging populations and stagnant or declining workforces.

So what happened? Why were the doomsayers so wrong? Did government policies go too far in averting an overpopulation crisis? Research shows that there never really was an overpopulation crisis in the sense that many feared. The demographic movements of the last two centuries were largely natural responses to advances in science and medicine, and population growth seems to have been a positive force for many countries.

False Prophets

Concerns about food and resource scarcities due to overpopulation were certainly not new to the 1970s. In fact, the

The World Population Takeoff



SOURCE: U.S. Census Bureau

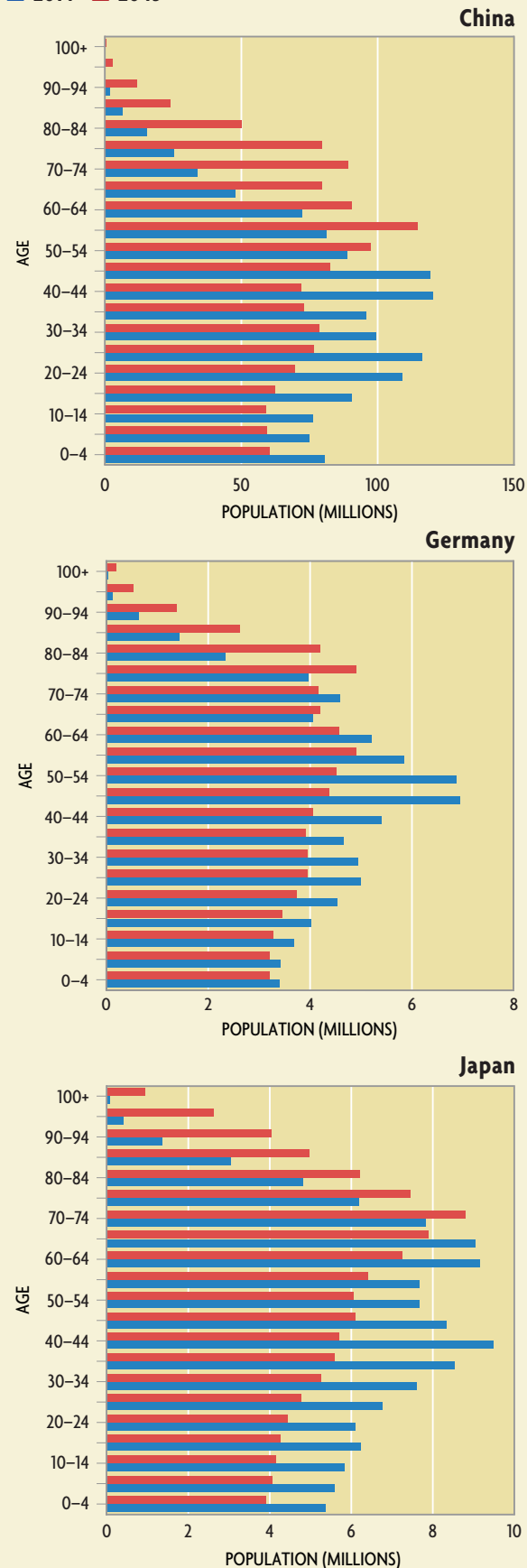
predictions of Ehrlich and others in some ways echoed the writings of 18th century economist Thomas Malthus. In his 1798 *Essay on the Principle of Population*, Malthus observed that the Earth's supply of arable land was largely fixed. He believed that improvements to existing land could increase the yield of subsistence, but only gradually. On the other hand, population, when unbounded from any constraints, would double roughly every 25 years, quickly outpacing food supply.

"By that law of our nature which makes food necessary to the life of man, the effects of these two unequal powers must be kept equal," Malthus wrote. "This implies a strong and constantly operating check on population from the difficulty of subsistence." Malthus saw two possible types of checks: voluntary (choosing to marry later, have fewer children) or involuntary (famine, war). Malthus believed involuntary checks were typically not necessary because people took into account their ability to provide for children when deciding to have a family. But he saw little means for near-term improvement. Malthus thought that population would increase when food became more available and economic conditions were good and contract during lean times, resulting in a populace that always hovered around subsistence levels.

His view largely fit the pattern of human history to that point, but it failed to predict the two centuries that followed. Population and productivity of arable land increased dramatically, while the quantity of land used for agriculture remained largely the same. In fact, economic research suggests that gains in agricultural productivity may have occurred because of rapid population growth. In a 1999 survey of more than 70 studies of the impact of population growth on the land quality of developing nations, Scott Templeton of Clemson University and Sara Scherr, president of Ecoagriculture Partners (a nonprofit that supports sustainable agricultural development), found a "U-shaped" relationship between population density and land productivity. All else being equal, increases in local population density make existing land more expensive and labor cheaper.

Aging Populations

■ 2014 ■ 2045



SOURCE: U.S. Census Bureau International Database

Initially, this can lead to some resource degradation in the form of deforestation as farmers use land more frequently or convert land to agricultural production. But as labor becomes comparatively cheaper, people begin to invest in techniques that economize on land, like soil fertilization or land improvements like terraces.

Similar economic processes can work to extend other natural resources as well. The late University of Maryland economist Julian Simon wrote in his 1981 book *The Ultimate Resource* that most natural resources were actually becoming more abundant in the 20th century despite rapidly growing populations. Simon argued that as long as markets were functioning, resource scarcity from higher populations would be reflected in higher prices, which in turn would prompt people to seek new ways to extract previously unprofitable resources or develop new ways to conserve and economize existing resources.

Simon famously wagered Ehrlich and his colleagues in 1980 that any raw materials of their choosing would be cheaper in 10 years after correcting for inflation, indicating that they had in fact become less scarce. Ehrlich selected \$1,000 worth of five different metals, agreeing that the loser of the bet would pay the other the difference in value 10 years later. In 1990, all five metals were significantly cheaper, and Ehrlich sent Simon a check for \$576.07. In some ways, Simon was lucky. Some of the metals Ehrlich chose were at cyclical highs. Had the bet been conducted during each decade of the 20th century, Simon would have come out ahead only about half of the time. And despite his overall optimism about the positive effects of population growth, Simon readily acknowledged that they were contingent on many other factors, like government institutions and functioning markets.

“A lot depends on the context,” says John Pender, a senior economist at the U.S. Department of Agriculture who studied the impact of population growth in developing countries like Honduras and Ethiopia. In a contribution to the 2001 book *Population Matters*, Pender found that increased population was negatively associated with crop yields and land sustainability in Honduras. But the effects were minor compared with more important factors like underdeveloped infrastructure and inefficient government policies.

Population can also impact resource sustainability through its interaction with economic development. “In a densely populated, resource-dependent economy, the real problem is poverty,” says Pender. “When you’re depending on a very small number of assets, you may sometimes be led to degrade your resources.”

Indeed, economists over the last 50 years have tried to pinpoint how population growth affects the economy.

Demography and Economic Growth

Does having more people help or hinder economic growth? As the typical economist refrain goes: It depends. Initially, there was little evidence that the rate of population growth played much role in economic development. But by looking at

both sources of population growth — rising fertility and falling mortality — economists have found that population does indeed influence economic potential in important ways.

The majority of the extraordinary population increase over the last century has been due to reductions in infant mortality and gains in overall life expectancy. In 1900, average life expectancy was 30 years, but by 2005, it had more than doubled to 66 years worldwide, and most demographers expect it to continue to rise. In addition to improving the quality of life of individuals around the world, such gains in lifespan have fostered economic growth. As people live longer, it becomes more profitable for them to invest in training and education. This means workers are better skilled when they enter the workforce and they live longer, healthier, more productive lives. And these gains have been widespread. According to research by Harvard University School of Public Health economists David Bloom and David Canning, infant mortality in poor countries is one-tenth to one-thirtieth as much as it was in countries with comparable levels of income in the 19th century.

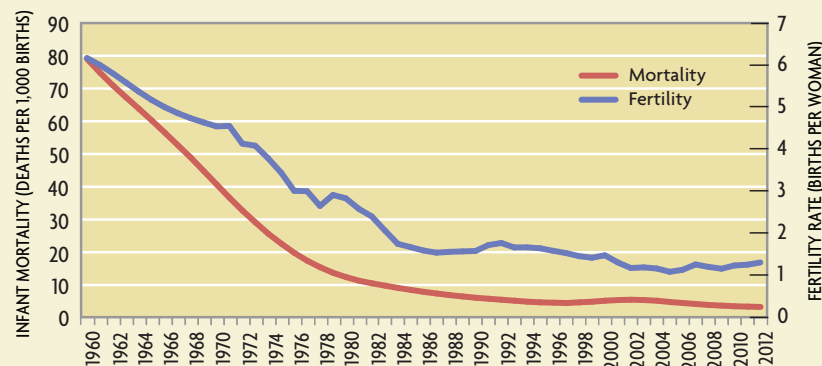
On the other hand, population growth driven by high fertility rates seems to be correlated with lower income, as measured by GDP per capita. The data seem to suggest that many countries fall into one of two “clubs”: low income and high fertility, or high income and low fertility. Just as higher life expectancy increases incentives to develop human capital, higher fertility rates make it more difficult to do so.

“If families are very large, then households have less money to invest in their children’s education,” says Abdo Yazbeck, lead economist at the World Bank’s Africa division. Having many children back-to-back also limits the opportunities for women to enter the workforce.

But the correlation between income and fertility runs in the opposite direction as well. The late University of Chicago economist and Nobel laureate Gary Becker showed that economic conditions influence family size decisions. In wealthier, developed nations where education and labor market opportunities for women are higher, the cost of forgoing wages to have children is greater, leading couples to have fewer children. Conversely, in nations with poor economic or education opportunities, women often marry younger and have more children at a younger age. This means the strong correlation in the data may reflect the tendency for countries to be pushed into one club or the other through positive or negative feedback effects. That is, good labor market and education opportunities reinforce lower fertility rates and vice versa.

The good news for developing nations is that mortality rates have been declining worldwide due to the spread of modern medicine, and there are also strong feedback effects between mortality and fertility rates. When mortality rates are high, families tend to “overshoot” their desired family size to insure against the possibility that some of their children

South Korea’s Demographic Transition



NOTE: Example of the rapidly falling mortality and fertility rates during the “East Asian miracle.”
SOURCE: World Bank

may not survive. But as mortality rates fall, families adjust and fertility rates decline. Depending on the speed of adjustment, this process can create a “demographic transition,” which creates the potential for significant economic gains.

“As both mortality and fertility decline, it changes the age structure of the population, impacting what is known as the dependency ratio,” explains Yazbeck. The dependency ratio refers to the number of young people (up to age 14) and old people (age 65 and over) in an economy compared to the number of working-age individuals.

High fertility rates imply a higher dependency ratio, as there are a larger number of nonworking children per family. This can act as a drag on economic growth as more resources are required for education and childcare, potentially diverting them from more productive areas of the economy. But if fertility rates change quickly in response to declining mortality, then the dependency ratio can decline as a “baby boom” generation enters the workforce with fewer dependents to care for.

“The key is the speed at which this process takes place. If both legs of the transition move fast, we now have very good evidence to suggest the impacts on the economy are huge,” says Yazbeck.

According to research by Bloom and fellow Harvard economist Jeffrey Williamson, this “demographic dividend” accounted for as much as a third of the economic growth enjoyed by a number of East Asian countries like Japan and South Korea between 1965 and 1990. During that time, the dependency ratio in East Asia fell from 0.77 to 0.48 as mortality and fertility rates both fell rapidly (see example in chart). Williamson estimated that a 1 percent increase in the growth rate of the working-age population is associated with a 1.46 percent increase in the growth rate of GDP per capita. Similarly, a 1 percent decrease in the growth rate of the dependent population is associated with a 1 percent increase in the growth rate of GDP per capita.

Of course, demography alone is not enough to produce an economic boom. In order to reap the rewards of the

demographic dividend, a country must have the institutions in place to productively put individuals to work. For example, during the same period as the “East Asian miracle,” demographic trends in Latin America resembled those of Southeast Asia. But episodes of high inflation, political instability, and restrictive trade or labor policies seem to have prevented those countries from benefiting from the demographic window in the same way. And for countries that do manage to capture the dividend, it doesn’t last forever. As the large working-age cohorts approach retirement, dependency ratios climb again.

Demographic Challenges and Opportunities

The last stage of the modern demographic transition is population aging. Gains in life expectancy alone will increase the number of retirees, but as “baby boomers” age, many countries face a dramatic reversal of the dependency ratio declines they enjoyed in previous decades. Japan, one of the earliest East Asian countries to begin its demographic transition, is now undergoing rapid population aging. About one in four people are currently over the age of 65, but by 2045 the number could be nearly two in five, according to the Census Bureau’s international database. European nations like Germany face similar patterns, as does China.

Just as elevated dependency ratios from high fertility rates can slow economic growth, an increase in retirees can have a similar effect. The European Union’s Economic Policy Committee wrote in 2010 that the increase in the proportion of retirees will “amplify expenditure on public pensions and health and long-term care and thus puts a burden on maintaining a sound balance between future public expenditure and tax revenues.” In addition to the challenges they pose for public finance, older individuals tend to work and save less, which means a decline in both labor and capital for developed economies.

In a 2011 working paper, Bloom, Canning, and fellow Harvard economist Günther Fink looked at the economic growth of countries between 1960 and 2005 (when dependency ratios were falling) and estimated what that growth might have looked like under the projected demographic trends for 2005 to 2050. Out of the 107 countries they analyzed, about half would have grown more slowly under the aging population trend. The authors estimated that OECD countries would have grown at 2.1 percentage points per year rather than

the observed 2.8. This means that the average OECD income per capita of \$10,000 in 1960 would have grown to \$25,500 in 2005, about \$10,000 less than actually observed.

But the authors note that their estimates likely overstate the effects for a number of reasons. For one thing, populations will adjust to changing demographics. As workers live longer, healthier lives, they may work longer. Additionally, other demographic groups may enter the labor force in greater numbers in response to increased demand for labor as baby boomers retire. Finally, the demographic shift that produced the dividend may also help to soften the blow of population aging: Because of declining fertility, the cohorts that followed the boom generation have higher levels of human capital as families and governments invested more in each child. Their higher productivity could then offset some of the losses from the large number of retirees.

In contrast, many developing nations have just begun their demographic transition. Youth dependency ratios in sub-Saharan Africa appear to have peaked in 1985, about 20 years after East Asia. Fertility and mortality rates have been falling steadily in many African countries, presenting the opportunity for an economic growth dividend from falling dependency ratios. In a 2011 article in *Population Studies*, University of Sussex economists Robert Eastwood and Michael Lipton estimated that between 1985 and 2025, sub-Saharan African countries may enjoy a demographic dividend equal to 0.32 percent per capita GDP growth per year. That dividend is smaller than the one enjoyed by East Asia, but given that demographic changes happen slowly, there is still time to build up markets and institutions to take even greater advantage of positive demographic forces.

“In general, the story is quite hopeful,” says Yazbeck. “But the reality is that this is a country-specific process, so some countries in Africa will be able to capture a sizable demographic dividend, and some probably will not.”

Yazbeck and other economists stress that having the correct policies in place — opportunities for human capital development, robust market economies, and access to modern health care — is the key to reinforcing and taking advantage of the demographic changes that have been occurring over the last two centuries. The upside for policymakers is that many of these policies are beneficial in and of themselves. Reinforcing growth-enhancing demographic changes is a free bonus. **EF**

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Islamic Banking, American Regulation

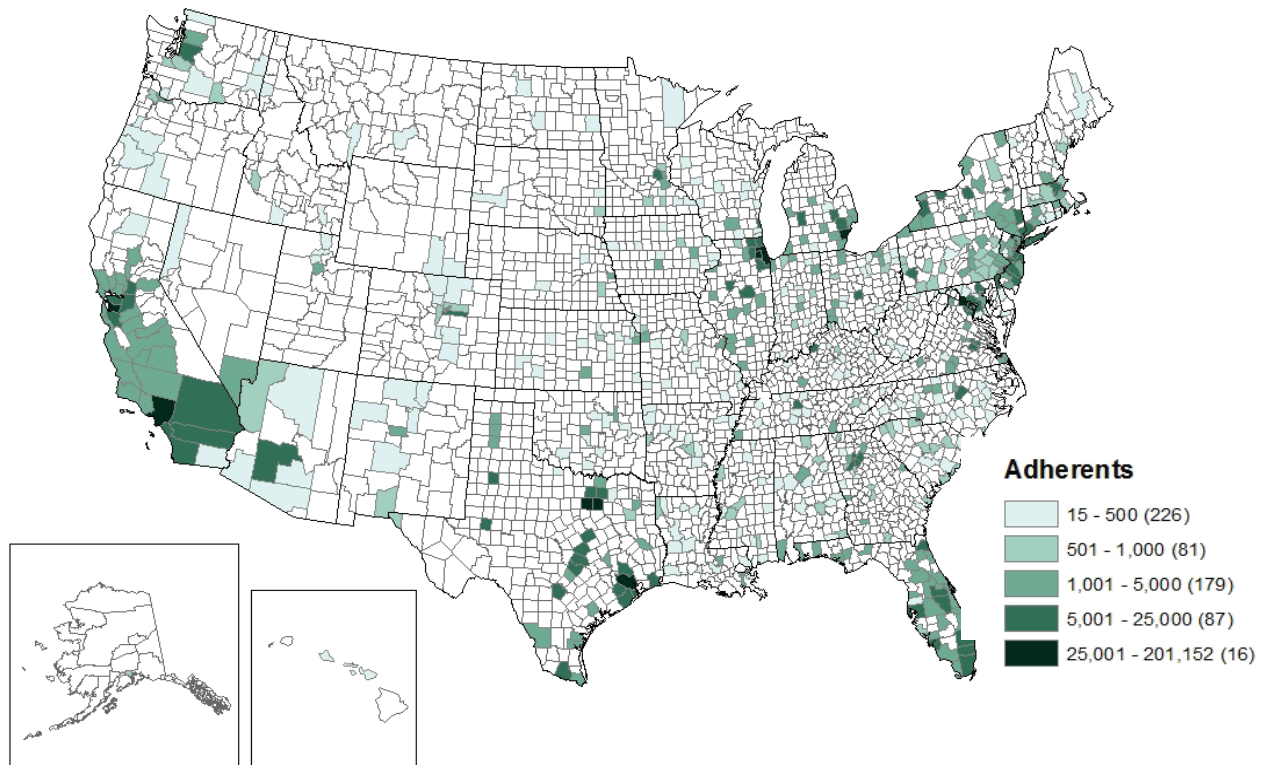
For some American Muslims,
Sharia-compliant banks are an important
part of the financial landscape

BY RENEE HALTOM

Most Americans don't have to think about whether basic banking services are available. If anything, it feels like the choices in savings accounts, auto loans, mortgages, and investment vehicles are overwhelming.

Not so for a certain segment of the U.S. population. There were roughly 2.8 million Muslims in the United States as of 2010, according to the Pew Research Center's Religion and Public Life Project, though estimates vary (see map on next page). The most recent study published by the Association of Statisticians of American Religious Bodies estimates that Islam was the fastest-growing religion in the United States between 2000 and 2010. Yet there are relatively few financial products available here for those followers who require their financial contracts to comply with Islamic laws and moral codes, called *Sharia* law.

Muslim Population in the United States



NOTES: There were 2,106 congregations and 2.6 million Muslim adherents reported in 592 counties in 2010. The numbers in parentheses indicate the number of counties that fall within each range. Only two counties — Harris County, Texas, and Cook County, Ill. — were reported as having more than 100,000 adherents.
SOURCE: 2010 U.S. Religion Census: Religious Congregations and Membership

Islamic finance is rooted in the principle that investments should create social value and not merely wealth. The Quran, the 1,400-year-old text that governs followers of Islam, prohibits *riba*, the charging or receiving of monetary benefit from lending money, interpreted in modern terms as a prohibition against interest. Islamic finance also prohibits excess risk or uncertainty (*gharar*), gambling (*maysir*), and sinful activities (*haram*). Transactions generally must be tied to real, tangible assets.

Globally, the Islamic finance industry is between \$1 trillion and \$1.5 trillion in size, according to the World Bank, in the vicinity of Australia's or Spain's gross domestic product. It's unsurprising, perhaps, since Muslims are almost a quarter of the world's population. That's an upper bound on the demand for Islamic finance, since not all Muslims demand *Sharia*-compliant contracts. But in Muslim-majority countries like Bangladesh, Islamic financial products constitute as much as two-thirds of total financial sector assets. There are more than 400 Islamic financial institutions across 58 countries. Roughly 5 percent of total Islamic financial assets are housed in non-Muslim regions like America, Europe, and Australia.

The United States' Muslim population is roughly equal to that of the United Kingdom, a country that houses \$19

billion in Islamic financial institution assets, more than 20 banks, and six that provide *Sharia*-compliant products exclusively. Yet our market for Islamic financial products is much smaller. There's no single list of participating firms or aggregate estimate of assets, but one can find roughly a dozen firms that routinely offer Islamic banking and investment products to businesses and consumers, though several don't even market such products on their websites.

At the same time, this is an industry on the rise. Just 20 years ago, there were few Islamic financial products being offered at all in the United States. The industry is rapidly growing and adapting to American regulation. Should we expect it to be a large presence in our future financial landscape?

How Does it Work?

Islamic finance may be rooted in ancient texts, but as an industry it is relatively young.

The broader field of Islamic economics originated in 1930s India, when the country's Muslim population, then about one-fifth of its total, feared marginalization by British colonialism and the Hindu-led movement for Indian independence. Heavily indebted Muslim farmers throughout the country were at risk of losing their land.

Scholars blamed an abandonment of Islamic principles and called for a return to “true” Islam. Economist Timur Kuran of Duke University, author of several books and articles on Islamic economics, has argued that this revival was part of a broader movement to restore Muslims to their faith, carve out an identity for Muslim minorities, and generally protect Muslim interests. The state of Pakistan emerged from the same effort.

Usury discussions in religious texts far predate this movement, of course. Many followers of Islam, along with other religions, loosened usury restrictions over time, until the last century when older notions of usurious interest were revitalized. Still, what constitutes *riba* has long been controversial. To some scholars, it means excessive interest — which led poor, indebted citizens to slavery in medieval times — while to others, it means any interest at all. Scholars have also disagreed on the virtues of charging interest for business investment versus consumption, allowing for inflation compensation, and a host of other matters.

Modern Islamic finance takes the narrower interpretation that no interest is permissible. Three alternative products are available in the United States. One of the most common contracts is *musharaka*, in which the lender and customer own an asset together, with the borrower’s share of the property increasing gradually with his payments until he assumes ownership entirely, with profits and losses shared. In a *murabaha* contract, the lender purchases an asset — a home or even commercial equipment — on behalf of a borrower, who gradually pays back the principal plus an agreed-upon markup and assumes ownership at the end. *Ijara* contracts resemble a lease-to-own arrangement that includes both repayment of principal and a rental fee for exclusive use of the asset.

The first bank following Islamic law opened in Egypt in 1963. Following the global oil boom, the industry developed in earnest in the Middle East in the mid-1970s. In the 1990s, the first international accounting standards were developed for Islamic finance, and the first market emerged for Islamic bonds. Those bonds, called *sukuk*, tie investments to tangible assets that issue payment streams based on their revenues, much like securitized equity financing.

Islamic finance came to the United States in the 1980s when two institutions opened on the West Coast. Their investment and home finance services were available only regionally. The market broadened considerably in the late 1990s, paralleling the Muslim population growth in the United States: 50 percent in the 1990s, and two-thirds in the 2000s.

The institutions operational today provide services in several states, most prevalently where the Muslim population is concentrated. University Islamic Financial (a subsidiary of University Bank) based in Ann Arbor, Mich., serving the large Muslim population of metropolitan Detroit and surrounding states, is the first and only exclusively *Sharia*-compliant bank in the United States — it offers no other products. Devon Bank in Chicago is the only other bank

regularly offering Islamic financing products. Reston, Va.-based Guidance Residential is the largest nonbank financial institution offering Islamic finance services, having provided more than \$3 billion — which it claims is nearly 80 percent of the total — in *musharaka* mortgage financing in 22 states since its doors opened in 2002. California-based LARIBA is another large Islamic mortgage lender, and it also provides business financing.

Is it Really Islamic?

To critics, Islamic finance is a distinction without a difference. According to research by Feisal Khan, an economics professor at Hobart and William Smith Colleges in upstate New York, most Islamic finance transactions are economically indistinguishable from traditional, debt- and interest-based finance. Where there is principal and a payment plan, there is an implied interest rate, Khan argued in a 2010 article. He is not the first economist to make such a claim. Many Islamic scholars argue that *murabaha* contracts don’t share risk and thus are not *Sharia* compliant — and experts estimate that such contracts constitute up to 80 percent of the global Islamic finance volume.

Other economists have noted that the terms of Islamic financial contracts often move with market interest rates. In the United States, Islamic financial products are frequently marketed with information about implied interest rates to allow customers to compare prices or simply to comply with American regulation. A study of Malaysia, the world’s largest Islamic finance market, found that Islamic deposit rates fluctuate in step with market interest rates.

To economists, it would not be surprising if Islamic and traditional finance tended to converge. A tenet of banking theory is that debt contracts with collateral minimize risk better than equity contracts when it is costly for banks to identify borrower-specific risks. Equity contracts, by comparison, entail greater monitoring costs or more risk. If equity contracts are less efficient, then one would expect banking institutions to gravitate away from them.

But to Islamic finance advocates, equivalent pricing does not create an equivalent product. Stephen Ranzini, president and CEO of University Bancorp, the holding company of the Islamic bank, acknowledges that there are firms that market themselves as *Sharia* compliant but that are taking standard loan documents and replacing the word “interest” with “lease.” But he says this does not describe the majority of Islamic financial service providers, who are concerned with the intent behind Islamic law. “True Islamic finance is absolutely not the same as traditional finance. The contracts are different; the risks are different.”

Ranzini also notes that Islamic lending is designed to protect borrowers who fall on hard times: Recourse if a borrower is unable to pay is rare, and firms generally cannot profit from a borrower’s financial distress since late fees in most cases can only cover the cost of collection. Most Islamic financial institutions have a supervisory board of *Sharia* scholars to review and approve the details of contracts.

Islamic investment firms have some more obvious differences from traditional finance. Their holdings must not involve alcohol, gambling, pork-based food — and according to some Islamic scholars, defense and weaponry, tobacco, or entertainment. Perhaps surprisingly, the United States is the fourth-largest domicile of Islamic investment funds, due almost entirely to the Amana Mutual Funds Trust based in Bellingham, Wash., whose income and growth funds hold almost \$3.5 billion in assets. As a group, Islamic investment funds hold primarily equities. Many employ a third party to screen the investments for *Sharia* compliance, or *halal*, often as defined by the Accounting and Auditing Organization for Islamic Financial Institutions, a body that sets global finance standards. Eligible investments typically must not derive more than 5 percent of income from activities considered unethical.

Regulatory Challenges

Regardless of whether Islamic finance is truly distinct, its economic similarities to traditional finance have opened doors in the United States.

Banks here are normally prohibited from taking on partnership or equity stakes in real estate, a provision meant to limit speculation. But in Islamic finance, the bank assumes formal ownership. Regulators in the United States have held, however, that Islamic finance is compatible with the prohibition on real estate investments in some cases. In 1997, the United Bank of Kuwait (UBK), which then had a branch in New York, requested interpretive letters from its regulator, the Office of the Comptroller of the Currency (OCC), on *ijara* and *murabaha* mortgage products. The OCC approved them on the very grounds that they were economically equivalent to traditional products.

In the OCC's view, because the purchase and sale transactions are executed simultaneously, the bank's ownership is merely for "a moment in time," and therefore the Islamic contracts avoid the type of risk that real estate restrictions were intended to limit. (The joint ownership that defines *musbaraka* contracts, on the other hand, is not currently approved for use by banks and is used in the United States only by nonbank mortgage lenders.) From an accounting standpoint, the transaction appears as a loan (an asset) on the bank's balance sheet. The borrower is responsible for maintaining the property and paying all expenses, and in the event of default, the bank may sell it to recover what is owed, as in a mortgage. UBK left the U.S. market in 2000 after financing the purchase of 60 homes, but regulators have since applied the OCC's guidance to other institutions.

In other ways, however, *Sharia* requirements have made

proliferation of Islamic finance difficult. Possibly because the products are unfamiliar to many investors, there is a smaller secondary market for Islamic financial products, so it has been harder for Islamic mortgage lenders to remain liquid, hindering the market's growth. In the United States, housing agencies Freddie Mac and Fannie Mae started buying Islamic mortgage products in 2001 and 2003, respectively, to provide liquidity, and they are now the primary investors in Islamic mortgages. By 2007, one firm, Guidance Residential, was relying on more than \$1 billion in financing from Freddie Mac.

Overall, there are few opportunities to take advantage of economies of scale with Islamic finance. "There's not a big enough market now for large, national banks to offer Islamic

products, and only in states with the largest Muslim concentrations is it worthwhile for the smaller banks to expand into that market," says Blake Goud, Islamic finance expert with the Thomson Reuters Islamic Finance Gateway.

Moreover, traditional deposit insurance — which banks rely on for stability — is at odds with *Sharia* law. In 2002, Virginia-based SHAPE Financial Corp. sought FDIC deposit insurance for an Islamic deposit-like product for which returns would fluctuate with the bank's profits and losses. The FDIC refused because the deposit could

decline in value, so SHAPE had to alter the product to be based solely on profit — not loss — sharing. This is now the United States' only Islamic deposit product, currently being offered by one institution, University Bank. Muslim depositors have been known to donate undesired proceeds to Islamic charities, a way to offset, or perhaps make peace with, a degree of *Sharia* noncompliance.

Prospects in the United States

Though the growth rate of the American Muslim population may have peaked due to demographics, it'll remain high in the near term. Globally, the Muslim population is forecast to grow twice as fast as the non-Muslim population through 2030. They'll continue to be small minorities here but will still more than double in that timeframe.

Some factors seem to suggest there is large latent demand for Islamic financial products in the United States. On average, Muslims in the United States are relatively high income and highly educated. They are also significantly younger than the average population — the median Muslim in North America is just 26, but the average American is 37 — and thus still approaching peak earning years.

But there are little data on what fraction of the U.S.

For the fraction of the U.S. Muslim population that demands *Sharia*-compliant financial services, the alternative is to not use financial services, to use conventional Western financial products, or to rely on informal avenues, such as borrowing and investing among family and friends.

Muslim population actually demands *Sharia*-compliant financial services. “There are not even consistent estimates of the size of the Muslim population,” Goud notes. A 1998 study from LARIBA contended that at most 2 percent of American Muslims will use only Islamic financing. The alternative is to not use financial services, to use conventional Western financial products, or to rely on informal avenues, such as borrowing and investing among family and friends.

There are limited data from countries with larger Muslim populations. A 2013 World Bank study of 64 such countries found that Muslims were significantly less likely than non-Muslims to have formal banking accounts, but they were no less likely to use financial services overall. It’s not clear whether that suggests simply a preference for informal financial services, or rather that customers could be drawn in if the right compliant products were available. Four percent of unbanked people in non-Muslim countries cite religious reasons, according to the World Bank, but the number is 7 percent in Organization of Islamic Cooperation countries, suggesting that Muslims may be somewhat more likely to have religious reasons for avoiding formal financial services. There are no data on whether U.S. Muslims are relatively unbanked. Only one-third of U.S. Muslims own their homes, compared with 58 percent of the general public, although that discrepancy could be partly explained by the relatively young age of the U.S. Muslim population (the average first-time American homebuyer is 34 years old).

At the same time, there’s no reason Islamic financial products must be restricted to Muslims, Ranzini says. For example, there is considerable overlap between Islamic finance and so-called “socially responsible” investing, such as mutual funds that buy equities of environmentally friendly or tobacco-free companies. A 2013 survey commissioned by Abu Dhabi Islamic Bank found that between 12 percent and 20 percent of customers in Turkey, Egypt, the United Arab Emirates, and Indonesia said they would bank only with *Sharia*-compliant institutions. But up to half said they preferred ethical investing, whether or not it was Islamic. If anything, Goud argues, Islamic standards are more restric-

tive because “socially responsible” investment products generally do not exclude leverage.

Because of restrictions on leverage, proponents argue that Islamic finance could be good for financial stability. “Islamic investors sold their stock in Worldcom and Enron as those companies’ leverage levels rose. Some potentially bad behaviors — excessive leverage and excessive financial engineering — wouldn’t even be possible in Islamic finance,” Ranzini says. Globally, Islamic finance assets have grown by more than 20 percent annually since the financial crisis, according to the Islamic Financial Services Board (IFSB), a multinational assembly that sets international standards for the industry.

It’s not that Islamic banks are better performers as a rule, since what they gain in safety, they may lose in efficiency. Where the differences seem to matter is during crises. A study by international economists Thorsten Beck, Asli Demirgüç-Kunt, and Ouarda Merrouche of several hundred institutions in 22 countries found that while Islamic banks tend to be less efficient, they are less prone to disintermediation during financial crises, when they remain better capitalized with lower loan losses. Separate studies by the International Monetary Fund and the IFSB also found superior performance following the 2007-2008 crisis.

Another factor is that non-Muslim governments are moving toward issuing *sukuk* to draw the investment of oil-rich Muslim countries. In June, the United Kingdom issued more than \$330 million in *sukuk* — compared with more than \$100 billion in global *sukuk* offerings in 2013 — becoming the first country outside the Islamic world to do so. Prime Minister David Cameron said he wanted to make London “one of the great capitals of Islamic finance anywhere in the world.” Luxembourg, Hong Kong, and South Africa have announced plans for their own offerings. *Sukuk* may also provide liquid assets to help domestic Islamic banks manage their balance sheets.

Whether Islamic finance continues to grow in the United States, the market is a small but significant segment of the American financial system. **EF**

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Expanding Unemployment Insurance

Longer unemployment benefits often mean longer unemployment spells, but economists say that's not always a bad thing

BY TIM SABLİK

As unemployment surged during the 2007-2009 recession, individuals who lost jobs turned to unemployment insurance (UI) for support. In normal times, states provide up to 26 weeks of UI benefits funded by a tax on employers. On average, these benefits replace about half of a worker's previous weekly wages. Since the 1970s, states and the federal government have also shared the cost of providing an additional 13 or 20 weeks of benefits to states with exceptionally high unemployment. During the last recession, the federal government took on 100 percent of the cost of these emergency benefits. Congress also enacted a series of additional extensions based on individual state unemployment rates. The combined programs meant that unemployed workers in many states could receive an unprecedented 99 weeks of UI benefits between 2009 and 2012 (see chart).

Proponents of the UI extensions argue that they provide valuable assistance to individuals struggling to find work in a weakened labor market. This allows the unemployed to maintain their consumption, supporters say, which also

helps boost the economy. But critics of the large extensions argue that UI provides a disincentive to look for work until the benefits expire, prolonging unemployment spells.

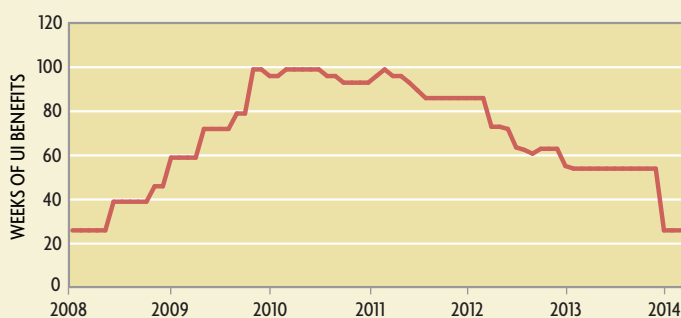
The emergency benefits expired on Dec. 28, 2013, returning the maximum duration for benefits to 26 weeks in most states. (North Carolina cut its benefits six months earlier; see "Moral Hazard and Measurement Hazard," p. 44). Lawmakers who favored the expiration say that labor market conditions have improved five years after the official end of the recession and that eliminating emergency benefits will improve conditions further by prompting more job seekers to find work. They point to the drop in unemployment from 6.7 percent to 6.1 percent in the seven months since the program expired as evidence of this improvement. But others in Congress want to reinstate the emergency benefits, arguing that labor market conditions are still weak and the falling unemployment rate reflects job seekers giving up rather than finding work; job seekers still need the additional help, they say.

Most economists agree that UI extensions contribute to longer unemployment spells, but the magnitude and importance of that effect are debated. Empirical evidence from the Great Recession suggests that the extended UI benefits had a small impact on unemployment duration, but there are other factors to consider as well when evaluating the program.

Insurance and Incentives

Searching for a job while unemployed is costly. Without access to income, job searchers must rely on accumulated savings or borrow to cover expenses while they find a new job. Research has shown that the average household in the United States does not have enough saved to weather prolonged joblessness. This means that laid-off workers might be forced to drastically reduce consumption, increase debt, or take the first job for which they qualify — even if they are overqualified. The latter is inefficient, resulting in lost productivity. UI benefits ease these constraints, allowing

Maximum Available Weeks of UI Benefits in Median State



SOURCE: Katharine Bradbury, "Labor Market Transitions and the Availability of Unemployment Insurance," Federal Reserve Bank of Boston Working Paper No. 14-2.

recipients to search longer and find a better-fitting replacement job. Labor economists call this the “liquidity effect,” and to the extent it drives the longer unemployment spells associated with UI, it’s not a bad thing.

“If what we see is just the liquidity effect, it means that we’ve helped job seekers better optimize their own welfare and society’s welfare,” says Jesse Rothstein, an economist at the University of California, Berkeley.

Like all insurance programs, however, UI runs the risk of encouraging the thing it is insuring against: unemployment. Because UI protects recipients from a portion of their wage losses, they may have less incentive to search for a replacement job until those benefits expire. Under this “moral hazard” interpretation, UI extends the duration of unemployment spells not because recipients are benefiting from reduced liquidity constraints to find a better job match, but because they are essentially “milking the system” before beginning their job search in earnest.

How do economists distinguish between these two effects? One way is to survey how UI recipients actually spend their time. In a 2010 *Journal of Public Economics* article, Princeton University economist Alan Krueger and Columbia University economist Andreas Mueller looked at data from the American Time Use Survey, which asks participants to keep a journal of how they spend their time each day. Krueger and Mueller found that UI recipients significantly increased job search efforts as their benefits approached expiration, while job seekers who were ineligible for UI benefits exhibited no such spike.

While such evidence points to moral hazard, there is also evidence that supports the liquidity effect as a driving factor of extended unemployment duration. Economists have compared UI to unemployment programs that do not suffer from moral hazard risk, such as lump-sum severance payments. Since severance payments provide cash up front, there is no incentive for recipients to extend their unemployment duration.

In a 2007 *Quarterly Journal of Economics* article, David Card of the University of California, Berkeley, Raj Chetty of Harvard University, and Andrea Weber of the University of Mannheim found that UI and severance payments in Austria extended unemployment duration by similar amounts. This suggests most UI recipients are not motivated to abuse the system.

“From that evidence, one can conclude that it’s generally beneficial to provide relatively generous unemployment insurance,” says Mueller.

It’s possible that different effects dominate depending on economic conditions, however. During recessions, when the labor market is weak, UI recipients may not have the ability to pick and choose among job offers, and the moral hazard effect may consequently be much less pronounced. In a 2011 paper, Johannes Schmieder of Boston University, Till von Wachter of the University of California, Los Angeles, and Stefan Bender of the Institute for Employment Research looked at data from Germany over a 20-year period to see

if the effects of UI varied across the business cycle. They found very little difference in UI’s effect on unemployment duration across the cycle, though disincentive effects were slightly smaller during downturns.

But even if the effects of UI on unemployment duration were entirely driven by moral hazard, the overall effect may not be very large. Rothstein looked at data from the Great Recession and found that UI extensions raised the unemployment rate by at most half a percentage point in early 2011. Several other studies have found similar or smaller effects.

“Even if none of what we observe is driven by the liquidity effect, the moral hazard is still much smaller than what we previously thought,” says Rothstein.

Macroeconomic and Long-Term Effects

Proponents of expanding UI benefits during economic downturns also argue that it helps the broader economy, not just individual recipients. To the extent that recipients are liquidity-constrained, increasing benefits allows them to smooth consumption. In addition to making recipients better off, proponents argue this elevates consumption levels for the overall economy. In a key study from 1994, MIT economist Jonathan Gruber found that UI benefits helped recipients in the United States maintain consumption close to their pre-unemployed level. Without the benefits, recipients’ consumption would have fallen by 22 percent, three times more than it did.

But just as UI affects individual incentives, it can also shape the incentives of employers to create jobs, which can have a negative effect on the broader economy. UI eases the liquidity constraints of job seekers and allows them greater ability to hold out for higher-paying jobs. All else equal, that pushes up the average threshold wage that would persuade a worker to take a job. Since the marginal profit from hiring is reduced, employers may post fewer vacancies.

Mueller says that macro effects like these are very difficult to assess empirically, but it is important to keep them in mind when determining how much — and for how long — to expand UI benefits. “The disincentive effects from UI are not that large,” he says. “But it is important to scale benefits down at some point because of the possibility that providing high benefits for a very long time changes cultural norms such that people begin to rely more on the program. If that were to happen, the disincentive effects might become larger than what we measure now.”

Indeed, there is some evidence that keeping expanded benefits in place for too long can change job seeker behavior over time. Thomas Lemieux of the University of British Columbia and W. Bentley MacLeod of the University of Southern California, Los Angeles, studied the effects of a major expansion in UI generosity implemented in Canada in 1971. The Canadian government reduced the duration of previous work required to qualify for the program from 30 weeks in a two-year period to eight weeks in a single year,

continued on page 35

Nicholas Bloom

Editor's Note: This is an abbreviated version of EF's conversation with Nicholas Bloom. For the full interview go to our website: www.richmondfed.org/publications

There's no question that the policies used to treat the Great Recession and its aftermath were extraordinary. After the housing decline and financial crisis cast doubt over trillions of dollars in financial assets worldwide, policymakers responded in kind with large-scale, unprecedented policies that generated uncertainty about future policy.

One question on many people's minds was, to what extent was policy uncertainty making the recession worse? And exactly how large had policy uncertainty become? Some said policy had created too much uncertainty, while others said policymakers hadn't done enough to mitigate the economic uncertainty caused by the recession.

This debate put Stanford University economist Nicholas Bloom's research in the spotlight. When Bloom started his Ph.D. at the University College of London in the mid-1990s, he was mainly interested in adjustment costs: how expensive it is to hire or fire a worker, or to buy a piece of equipment and get rid of it. Bloom thought adjustment costs would be even more important in an uncertain environment, which would make mistakes more likely. He has devoted much of his research career since then to quantifying uncertainty and measuring how it affects the economy, with several measures displayed on the website PolicyUncertainty.com.

After earning his doctorate in economics in 2001, Bloom worked at the management consulting firm McKinsey & Co. and became interested in a second hard-to-measure phenomenon: the effect of good versus bad management practices on the productivity of firms. With co-authors, he launched the World Management Survey, which documents management practices across more than 10,000 firms worldwide in manufacturing, retail, schools, and hospitals.

Large-scale measurement, Bloom says, is the next frontier in research on both uncertainty and management. It wasn't long ago that economists were skeptical of efforts to accumulate comprehensive datasets over time, such as the measures of aggregate economic activity that Simon Kuznets pioneered in the 1940s. Today, it is hard to imagine policymaking without them. With Bloom and his co-authors' continued efforts, research on uncertainty and the effects of management may follow the same path.

Renee Haltom interviewed Bloom via videoconference in October 2014.



EF: “Uncertainty” is a broad term. What does it mean in your research, and how can we measure it?

Bloom: There isn't a standard accepted definition. The average Joe on the street would say that uncertainty is not knowing the future. For example, the outcome of the Giants-Royals World Series is uncertain when it's happening. And that definition works well in most contexts.

In economic models this can be formally represented as the “stochastic [random] volatility” of factors — such as productivity or demand — that drive economic activity. When volatility is higher, uncertainty would be higher. That's the definition financial economists would use and I typically have used when modelling uncertainty shocks.

There is another definition going back to Frank Knight, the late Chicago economist. He defined “risk” as when you have a known distribution for a future outcome and uncertainty as when you have an unknown distribution. For example, the outcome of a coin flip is risky, while the economy was uncertain post 9/11 because it was almost impossible to predict what would come next. This definition of uncertainty is often called Knightian Uncertainty.

In terms of measuring uncertainty in the economy, we currently only have proxies — stock market volatility, newspaper mentions of uncertainty, or the volatility of macroeconomic data. But that's something I hope will improve over time.

The old example of an uncertainty shock that I used in my Ph.D. work in the early 2000s was 9/11. This event

generated a spike in every measure of uncertainty. Then the Great Recession hit, and this made the 9/11 uncertainty spike look like a small blip. Measures of uncertainty — like the VIX index of stock market volatility [the Chicago Board Options Exchange Market Volatility Index], which measures the market’s expected volatility over the next 30 days — went up by about 500 percent. Similarly, newspaper indices of uncertainty jumped up by about 300 percent. Even the Federal Reserve’s Beige Book had a surge of discussion of uncertainty — before the Great Recession, each month had about three or four mentions of the word “uncertain,” but after the Great Recession it hit nearly 30.

Interestingly, the Great Depression of 1929-1933 was another period where there was broad concern over uncertainty. Newspaper coverage of uncertainty and stock market volatility rose sharply in this period. In fact, one of Ben Bernanke’s key papers before he became Fed chairman was, amazingly, on how uncertainty can impair investment. Christina Romer, chair of President Obama’s Council of Economic Advisers during the Great Recession, had studied uncertainty too. So some of the key policymakers in Washington at the time were acutely aware of what uncertainty could do to an economy.

EF: To what extent does uncertainty cause recessions, versus recessions causing uncertainty?

Bloom: This is a key question in the literature. Economists love clean models and clean stories, but I think in this case we have to recognize that causation runs both ways.

Recessions typically start with a nasty shock — like an oil shock, a financial crisis, or a war — a negative “first moment” shock, in the language of economics models. These shocks also induce uncertainty, known as a “second moment” shock.

For example, both of the oil shocks in the 1970s pushed the economy into recession through higher oil prices, but they also increased uncertainty over future oil prices and global economic growth. Likewise, the recent U.S. and European housing and financial crises were both bad news but also increased economic uncertainty.

Moreover, recessions tend to induce uncertainty on an ongoing basis. As conditions worsen, businesses slow down, firms fail, and consumers change behavior. Likewise, as policymakers try to revive growth, they tend to try increasingly extreme policies, which have the negative side effect of increasing uncertainty. So recessions and uncertainty are tied together in a vicious cycle. Uncertainty leads to recession, which increases uncertainty, making the recession worse.

A lesson from uncertainty research is the medical principle of “first, do no harm.” It may be that policy actions generate more uncertainty damage than help. Politicians often act based on partial information or hastily developed ideas, when often the best course would be to stay calm and inactive.

EF: What are the most important things we learned in the Great Recession and its aftermath about the effects of uncertainty?

Bloom: One obvious lesson is that high uncertainty can indeed slow economic growth in the short run. The basic idea is that firms and consumers struggle to make decisions if they are really uncertain about the future. The reason being that bad decisions, such as investments or hires that you come to regret in the future, are often costly to reverse. In economics terms, firms face

“adjustment costs.” So when uncertainty spikes, the natural response is to pause to avoid making a costly mistake. And of course, if every firm and consumer in the economy pauses, a recession ensues.

Therefore, the second lesson is the medical principle of “first, do no harm.” It may be that policy actions generate more uncertainty damage than help. One reason is that policymakers have an incentive to be policy hyperactive. I saw this when I worked in the U.K. Treasury. Politicians had to be seen as acting in response to bad events; otherwise, the public and media claimed they were not responding or, worse, claimed they didn’t care. So politicians would act, often based on partial information or hastily developed ideas, when often the best course would be to stay calm and inactive.

So hasty or unpredictable policy response to recessions can actually make the recessions worse. A classic example is the accelerated depreciation allowance that Congress debated introducing for several months after the 9/11 attacks. Many commentators argued that this delayed the recovery as businesses waited to see what the decision would be. In fact, the Nov. 6, 2001, FOMC minutes even contained an explicit discussion of the damaging policy uncertainty this introduced.

EF: How big a factor was policy uncertainty in the severity of the Great Recession and its slow recovery?

Bloom: That’s a very tough question to answer. The full experiment is this: If you held everything else constant and did not have the rise in uncertainty, what would have happened to the drop in economic output? I think, based on some rough calculations I lay out in my 2014 *Journal of Economic Perspectives* paper, that the recession would have been about one-third less. So I think uncertainty was a major factor, though not the biggest factor, which I think was a combination of the housing and financial crises.

If you then break out policy uncertainty from uncertainty, it’s even harder to tell. From my paper with Scott Baker and Steve Davis, the best evidence that it matters is when we look at individual sectors. We interact our policy uncertainty measure with sector-level measures of the exposure to

government, meaning the share of sector revenue that comes from government contracts. The share is very high for defense, health care, and construction. When policy uncertainty was higher, those sectors had much more stock market volatility and had far bigger reductions in investment and employment. That's even after controlling for other factors, like the level and forecast of government spending. So policy uncertainty does appear to be damaging, particularly in government-dependent sectors like health and defense.

But aggregating those numbers, from one sector to the overall economy, is hard. My guess would be that policy uncertainty caused 10 to 20 percent of the recession, but that's a pretty wild guess. And even if we can show there's a negative effect of policy uncertainty overall, it's hard to talk about the effects of one individual policy or another. Hopefully that'll be the end game for this research, but we're not there yet.

EF: Another branch of your research has focused on how management practices affect firm and country productivity. Why do you think management practices are so important?

Bloom: My personal interest was formed by working at McKinsey, the management consulting firm. I was there for about a year and a half, working in the London office for industrial and retail clients.

There's also a lot of suggestive evidence that management matters. For example, Lucia Foster, John Haltiwanger, and Chad Syverson found using census data that there are enormous differences in performance across firms, even within very narrow industry classifications. In the United Kingdom years ago, there was this line of biscuit factories — cookie factories, to Americans — that were owned by the same company in different countries. Their productivity variation was enormous, with these differences being attributed to variations in management. If you look at key macro papers like Robert Lucas' 1978 "span of control" model or Marc Melitz's 2003 *Econometrica* paper, they also talk about productivity differences, often linking this with management.

Economists have, in fact, long argued that management matters. Francis Walker, a founder and the first president of the American Economic Association, ran the 1870 U.S.

Nicholas Bloom

► Present Position

Professor of Economics, Stanford University Economics Department; Professor by Courtesy, Stanford University Graduate School of Business; Co-Director of the Productivity, Innovation and Entrepreneurship Program, National Bureau of Economic Research

► Selected Previous Positions

Research Fellow, Centre for Economic Performance, London School of Economics (2003-2006); Management Consultant, McKinsey & Company (2002-2003); Business Tax Policy Advisor, Her Majesty's Treasury (2001-2002); Research Economist, Institute for Fiscal Studies (U.K.; 1996-2002)

► Education

B.A., Cambridge University (1994)
MPhil., Oxford University (1996)
Ph.D., University College of London (2001)

► Selected Publications

"Does Management Matter: Evidence from India," *Quarterly Journal of Economics*, 2013 (with Benn Eifert, Aprajit Mahajan, David McKenzie, and John Roberts); "Identifying Technology Spillovers and Product Market Rivalry," *Econometrica*, 2013 (with Mark Schankerman and John Van Reenen); "The Impact of Uncertainty Shocks," *Econometrica*, 2009; numerous other articles in journals such as the *American Economic Review*, *Review of Economic Studies*, and *Journal of Public Economics*

census and then wrote an article in the first year of the *Quarterly Journal of Economics*, "The Source of Business Profits." He argued that management was the biggest driver of the huge differences in business performance that he observed across literally thousands of firms.

Almost 150 years later, work looking at manufacturing plants shows a massive variation in business performance; the 90th percentile plant now has twice the total factor productivity of the 10th percentile plant. Similarly, there are massive spreads across countries — for example, U.S. productivity is about five times that of India.

Despite the early attention on management by Francis Walker, the topic dropped down a bit in economics, I think because "management" became a bad word in the field. Early on I used to joke that when I turned up at seminars people would see the "M-word" in the seminar title and their view of my IQ was instantly minus 20. Then they'd hear the British accent, and I'd get 15 back. People thought management was quack doctor research — all pulp-fiction business books sold in airports.

Management matters, obviously, for economic growth — if we could rapidly improve management practices, we would quickly end the current growth slowdown. It also matters for public services. For example, schools

that regularly evaluate their teachers, provide feedback on best practices, and use data to spot and help struggling students have dramatically better educational outcomes. Likewise, hospitals that evaluate nurses and doctors to provide feedback and training, address struggling employees, and reward high performers provide dramatically better patient care. I teach my Stanford students a case study from Virginia Mason, the famous Seattle hospital that put in place a huge lean-management overhaul and saw a dramatic improvement in health care outcomes, including lower mortality rates. So if I get sick, I definitely want to be treated at a well-managed hospital.

EF: How much of the productivity differences that you just discussed are driven by management?

Bloom: Research from the World Management Survey that Raffaella Sadun, John Van Reenen, and I developed

suggests that management accounts for about 25 percent of the productivity differences between firms in the United States. This is a huge number; to give you a benchmark, IT or R&D appears to account for maybe 10 percent to 20 percent of the productivity spread based on firm and census data. So management seems more important even than technology or innovation for explaining variations in firm performance.

Coincidentally, you do the same exercise across countries and it's also about 25 percent. The share is actually higher between the United States and Europe, where it's more like a third, and it's lower between the United States and developed countries, where it's more like 10 to 15 percent.

Now, you may not be surprised to learn that there are significant productivity differences between India and the United States. But you look at somewhere like the United Kingdom, and it's amazing: Its productivity is about 75 percent of America's. The United Kingdom is a very similar country in terms of education, competition levels, and many other things. So what causes the gap? It is a real struggle to explain what it is beyond, frankly, management.

EF: What can policy do to improve management practices?

Bloom: I think policy matters a lot. We highlight five policies. One is competition. I think the key driver of America's management leadership has been its big, open, and competitive markets. If Sam Walton had been based in Italy or in India, he would have five stores by now, probably called "Sam Walton's Family Market." Each one would have been managed by one of his sons or sons-in-law. Whereas in America, Walmart now has thousands of stores, run by professional nonfamily managers. This expansion of Walmart has improved retail productivity across the country. Competition generates a lot of diversity through rapid entry and exit, and the winners get big very fast, so best practices spread rapidly in competitive, well-functioning markets.

The second policy factor is rule of law, which allows well-managed firms to expand. Having visited India for the work with Benn Eifert, Aprajit Mahajan, David McKenzie, and John Roberts, I can say this: The absence of rule of law is a killer for good management. If you take a case to court in India, it takes 10 to 15 years to come to fruition. In most developing countries, the legal system is weak; it is hard to successfully prosecute employees who steal from you or customers who do not pay their invoices, leading firms to use family members as managers and supply only narrow groups of trusted customers. This makes it very hard to be well managed — if most firms have the son or grandson of the founder running the firm, working with the same customers as 20 years ago, then it shouldn't be surprising that productivity is low. These firms know that their sons are often not the best manager, but at least they will not rampantly steal from the firms.

The third policy factor is education, which is strongly correlated with management practices. Educated and numerate

employees seem to more rapidly and effectively adopt efficient management practices.

The fourth policy factor is foreign direct investment, as multinational firms help to spread management best practices around the world. Multinational firms are typically incredibly well run, and that spills over. It's even true in America, where its car industry has benefited tremendously from Honda, Toyota, Mitsubishi, and Volkswagen. When these foreign car manufacturers first came to America, they achieved far higher levels of productivity than domestic U.S. firms, which forced the American car manufacturers to improve to survive.

The fifth factor is labor regulation, which allows firms to adopt strong management practices unimpeded by government. In places like France, you can't fire underperformers, and as a result, it's very hard to enforce proper management.

EF: Management practices can be viewed as "soft" technologies, compared to so-called "hard" technologies such as information technology. Do you see anything special about the invention and adoption of these "soft" technologies relative to "hard" technologies?

Bloom: The only distinction is that hard technologies, like my Apple iPhone, are protected by patents, whereas process innovations are protected by secrecy.

The late Zvi Griliches, a famous Harvard economist, broke it down into two groups: process and product innovations. Most people who think of innovation think of product innovations like the shiny new iPhone or new drugs. But actually a lot of it is process innovations, which are largely management practices.

Good examples would be Frederick Winslow Taylor and scientific management 100 years ago, or Alfred Sloan, who turned a struggling General Motors into the world's biggest company. Sloan pushed power and decision-making down to lower-level individuals and gave them incentives — called the M-form firm. It seems perfectly standard now, but back then firms were very hierarchical, almost Soviet-style. And then there was modern human resources from the 1960s onward — the idea that you want to measure people, promote them, and give them rewards. Most recently, we have had "lean manufacturing," pioneered by Toyota from the 1990s onward, which is now spreading to health care and retail. This focused on data collection and continuous improvement.

These have been major milestones in management technologies, and they've changed the way people have thought. They were clearly identified innovations, and I don't think there's a single patent among them. These management innovations are a big deal, and they spread right across the economy.

In fact, there's a management technology frontier that's continuously moving forward, and the United States is pretty much at the front with firms like Walmart, GE, McDonald's, and Starbucks. And then behind the frontier there are a bunch of laggards with inferior management practices. In America, these are typically smaller, family-run firms.

EF: What are the key challenges for future research on management?

Bloom: One challenge is measurement. We want to improve our measurement of management, which is narrow and noisy.

The second challenge is identification and quantification: finding out what causes what and its magnitude. For example, can we quantify the causal impact of better rule of law on management? I get asked by institutions like the World Bank and national governments which policies have the most impact on management practices and what size impact this would be? All I can do is give the five-factor list I've relayed here; it's very hard to give any ordering, and there are definitely no dollar signs on them. I would love to be able to say that spending \$100 million on a modern court system will deliver \$X million in extra output per year.

One way to get around this — the way macroeconomists got around it — is to gather great data going back 50 years and then exploit random shocks to isolate causation. This is what we are trying to do with the World Management Survey. The other way is a bit more deliberate: to run field experiments by talking with specific firms across countries.

EF: Speaking of the World Management Survey, is there any precedent for it, or is it the first of its kind?

Bloom: I'm not aware of anything long lasting. There have been previous attempts to do cross-country management surveys, but what happened is they ran one or two waves and then hit serious issues with comparability and sustainability. You've got to be very consistent on methodology across countries and across time, which is very hard. The alternative model is to have each country fund and run its own survey, but then you've got an apples and oranges problem. I think we're the first to be very systematic by trying to apply tightly the same methodology across countries.

The U.S. Census also ran a management survey in 2010. It's called MOPS, the Management and Organizational Practices Survey, and it surveyed 50,000 American factories. We're working with them on redoing that in 2015 to start tracking differences. The Germans, the Pakistanis, and the Canadians are also putting management questions into their censuses.

EF: You've spent a lot of your career trying to quantify the seemingly unquantifiable, such as uncertainty and the effects that trust and management practices have on productivity. Is that a coincidence?

Bloom: Anything that can be said to be "high" or "low" can be quantified, and economics is good at this; it's one of our strengths as a social science.

I chose these two topics — uncertainty and management — more by good luck than by design. During my Ph.D. studies, I became interested in estimating adjustment costs and from that moved into the literature on real options, which naturally led to uncertainty. I realized the empirical literature on uncertainty was relatively small compared to the theoretical literature, and I started to work on that. I was fortunate to have been doing that in the early 2000s, before the Great Recession, which kicked this topic up into public consciousness. And my interest in management came from working at McKinsey as a consultant and noticing the huge differences in management practices across firms and how this seemed to drive massive performance differences, but management was mostly ignored by economists.

There's an old saying: What gets measured gets managed. I think in economics it's what gets measured gets researched. A great example is the patents database at the National Bureau of Economic Research, put up by Bronwyn Hall, Adam Jaffe, and Manuel Trajtenberg. The database is unbelievable and has really generated enormous growth in the innovation field. Likewise with management — we hope if we can build a new multifirm and multicountry database, we can spur the development of the field.

EF: What are you working on next?

Bloom: A range of topics, but focused on uncertainty and management in particular. One is trying to improve our measurement and understanding of uncertainty. As I mentioned earlier, we currently only have proxies. I hope to more directly measure firm-level uncertainty, which is what ultimately drives business decisions, and use this to measure and model the impact of uncertainty on the economy. This measure would be based on the expectations of firms. I have been working with the Atlanta Fed and the Census Bureau to develop large-scale, monthly surveys of distributional expectations of many thousands of U.S. firms across the country.

A second area is trying to improve our time-series and cross-country measurement of management to get at many of the policy questions we've discussed. To understand, for example, the impact of the rule of law or competition on management and growth, we need to collect data before and after major reforms. Building large international panel datasets is the best way to do this. Alongside this, I am continuing to work on field experiments on management in the United States and abroad to try to pinpoint some key drivers in a laboratory-style environment.

As you've seen in the questions you've asked, on uncertainty in particular, it's still hard to address some of the policy questions on these topics. For both uncertainty and management, I think measurement is the way to get at causation and policy implications. **EF**

Breaking into the Mainstream

BY AARON STEELMAN

In 2003, administrators at the University of Notre Dame decided to split the Department of Economics into two: the Department of Economics and Policy Studies (DEPS) and the Department of Economics and Econometrics (DEE). Why the divide? In large part because there were significant differences in methodological approaches and fields of study within the department.

Those who considered themselves within the “mainstream” of the profession, generally using a neoclassical framework to examine issues such as economic growth and industrial organization, tended to move to the DEE. Those whose work was generally considered more “heterodox” or “pluralistic,” employing a variety of methodological approaches to address questions regarding race and gender, inequality, and the development of economic thought, among others, tended to form the nucleus of the DEPS. Less than a decade later, the DEPS was closed by university administrators and what was simply called the Department of Economics emerged again.

Faculty within the DEE tended to neatly fit into the new department, while many faculty members within the DEPS moved to various departments throughout the university. Developments at Notre Dame reflect divisions within the economics profession more broadly. Heterodox economists have formed roughly 20 associations around the world, including the Union for Radical Political Economics and the Society for the Advancement of Socio-Economics. Most of their members are considered to be on the left of the political spectrum and have clustered in a relatively small number of Ph.D. granting institutions around the country, including American University (AU), Colorado State University, the University of Massachusetts at Amherst (UMass), and the University of Missouri-Kansas City.

Not all departments with a strong heterodox presence are generally considered left-leaning, however. For instance, at Clemson University, Florida State University, and George Mason University (GMU), all of which also offer Ph.D. programs, students can work with faculty members interested in Austrian economics, public choice analysis, and experimental economics. Many of the prominent figures in those fields are thought of as vigorous defenders of the free market.

Does that mean such departments are explicitly ideological, as some have charged? Not necessarily. Economists at those institutions, like nearly everyone in the profession, have opinions about what the world *ought* to look like. “We all come to the study of economics with a set of predispositions,” says Robert Pollin, an economist at UMass. “I am quite open about my commitment to egalitarianism as a general pre-analytical social commitment. I think it is fair to say that virtually all of my UMass colleagues share that

commitment in various specific ways.” But economists who claim to be “apolitical centrists,” Pollin says, also have “a pre-analytical vision, no less than being an egalitarian.”

Moreover, holding relatively strong normative views doesn’t mean that ethical principles necessarily trump scientific investigation. Pete Boettke, an editor of the *Review of Austrian Economics*, did his Ph.D. at George Mason and taught at three institutions, including New York University, once considered the leading center of study in Austrian economics, before returning to GMU.

Boettke notes that “GMU is often misunderstood by outsiders because so many of our faculty are significant national and international voices in defending the free market that outsiders tend to think of the place as rather homogeneous.” But, he says, “when it comes to economic theory and economic methodology, GMU is one of the most diverse scientific environments,” a setting where economics, not ideology, is stressed. Pollin adds that if “one wants a solid grounding in mainstream economics and one wants to develop technical skills necessary to operate effectively as a professional economist, then UMass is a truly outstanding place to drink in all that economics has to offer.”

No heterodox department is generally considered to be among the top 50 departments in the country. But that doesn’t mean the students drawn to them are mediocre. Mieke Meurs is an economist and a former Ph.D. program director at AU. “Every year we attract students of a quality that one would not expect, given our ranking. These students come to AU because they want to study a variety of approaches to economic questions,” she says. “One former student explained it this way: If the only tool you have is a hammer, every problem looks like a nail. I use this analogy to talk about the usefulness of heterodox approaches.”

Nearly all students from heterodox departments find jobs as professional economists. But most find employment at liberal arts colleges, branch campuses of state universities, and nonprofit institutions. Not many are able to break into departments at highly ranked research universities.

Will today’s heterodox departments generally stay on the outside looking in at the heart of the profession? Probably for quite some time. But many heterodox economists point to an example from the 1950s and early 1960s. At that time, economists at the University of Chicago such as Milton Friedman and George Stigler led the challenge to the prevailing Keynesian orthodoxy. Within two decades they were at the forefront of the profession and had built Chicago, an already strong department, into a powerhouse. No one is predicting a similar ascendancy for AU, GMU, or UMass, but the more optimistic envision a time when they, too, will find a place within the mainstream of the profession. **EF**

ECONOMIC HISTORY

Reading Between the Lines

BY CHARLES GERENA

How the grocery industry coalesced behind the UPC bar code

Dallas, May 1971 — the city was hosting the largest gathering of the grocery industry, the annual convention of the Super Market Institute (now the Food Marketing Institute). Reporters roamed the convention floor while friends reacquainted themselves.

R. Burt Gookin, president and CEO of the H.J. Heinz Company, was a featured speaker. He was scheduled to provide an update on an industrywide effort to devise a standard product code, something that past workgroups had tried and failed. What the attendees didn't know was that the executive would be laying the groundwork for a multiyear push into new technology, an effort that would put his industry connections to the test.

In his speech, Gookin urged every grocery manufacturer and retailer to adopt a Universal Product Code (UPC) that would help modernize the labor-intensive grocery business. "We hadn't had anything like this," recalls Thomas Wilson Jr., a former consultant at McKinsey & Company who helped Gookin and his group come up with

the UPC. "Technology was stumbling along in the grocery industry. A number of good friends who were top executives came up to me afterward and said, 'This is a big deal, isn't it?'"

Indeed, the UPC and the ubiquitous bar code that represents it have transformed the supply chain, not only in the grocery industry but also in other sectors of the economy. Goods are better managed at every step, from the supplier's truck to the store's shelf to the customer's bag.

The grocery industry, which was more fragmented in the 1970s than it is today, agreed upon the system — a numerical code for storing information about a product and a symbol to represent that code — in less than three years. Business history in the United States has plenty of examples of firms that couldn't coordinate their efforts to develop an industry standard without lengthy wars, such as that between the Betamax and VHS videotape standards in the 1970s and 1980s and between the Blu-ray and HD-DVD formats in the 2000s.

What made the difference with the UPC bar code? Technological advances provided the means. Economic pressures provided the motivation to align the competing interests of grocery manufacturers and retailers behind a single standard. The pragmatism and determination of key executives like Gookin helped overcome the industry's inertia.

IBM had a major role to play, specifically its retail store systems division, now owned by Toshiba but still based in Research Triangle Park in Raleigh, N.C. The company proposed the bar code design that was chosen to represent the UPC and developed one of the first supermarket scanners in its Raleigh facilities. (IBM even commandeered a supermarket in the Cameron Village shopping center to take a publicity photo for its new scanner.)



An early bar code scanner at a Marsh supermarket in Troy, Ohio, on June 26, 1974.

PHOTOGRAPHY: COURTESY OF MARSH SUPERMARKETS

Lines in the Sand

The idea of automating the checkout process dates back to the 1930s. But it wasn't pursued until a pair of graduate students in Philadelphia, Bernard Silver and Joseph Woodland, decided to take up a challenge posed by the CEO of a local retailer in the late 1940s. They came up with a pattern of thick and thin lines to represent information, similar to how groups of dots and dashes sent over a telegraph can carry a message. The inspiration came during Woodland's trip to a beach when he idly drew lines in the sand.

In 1949, the pair filed for a patent for a bull's-eye variation of their idea that encoded information using a pattern of concentric circles. Two years later, Woodland joined IBM but was unsuccessful at selling the patent to the multibillion-dollar corporation. He eventually sold the bar code patent to Philco, which later sold it to RCA.

There were a couple of reasons why no one was interested in Silver and Woodland's idea. First, the technology didn't exist to reliably read bar codes. Second, bar codes didn't have much economic value without a standard for how that information was stored and read by a machine.

Flash forward to the late 1960s and early 1970s. Grocery retailers were being squeezed by inflationary pressures. They made less than a penny on every dollar of sales after taxes, says Bill Selmeier, founder of a virtual museum of the bar code called IDHistory.com. Selmeier helped market the UPC at IBM.

With such razor-thin margins, grocers looked to reduce costs wherever they could. According to Selmeier, labor costs of checkout clerks were a significant percentage of a store's operating expenses. "There were almost as many clerk hours as there were backroom hours," he explains. The cost of mistakes in ringing up purchases was also high, as was the cost of individually pricing goods.

The high inflation of the 1970s also complicated pricing. "Grocers wanted the flexibility to change prices without having to peel off all the price stickers on items in inventory and applying new stickers, and risking some cashiers not paying attention and charging the old price after all," says Emek Basker, an economist at the University of Missouri who has studied the economic effects of bar codes.

Around the same time, several manufacturers of front-end equipment for grocery stores began talking to their clients about modernizing the checkout process. They were working on something that could automatically read product information into a computer system — an electronic scanner. Stop & Shop and Sylvania teamed up to test a scanner that used incandescent light. RCA approached Kroger about developing a scanner that used the company's

laser and machine-readable symbol, which was shaped like a bull's-eye and based on Silver and Woodland's design.

The problem was the lack of a standard product code. Grocery manufacturers and retailers had different numbering systems, while each chain of stores had its own. "That would have been an impossible problem for the grocery manufacturers to tackle. They would have had to have inventory that was different for each chain," notes Barry Franz, a former associate director at Procter & Gamble, during an oral history interview. Franz was one of the executives who represented grocery manufacturers during the UPC's development.

Setting the Standard

Earlier in the 1960s, workgroups within the Grocery Manufacturers Association (GMA) and the National Association of Food Chains (NAFC) joined together to tackle the issue of standardization. While they agreed that something needed to be done, they couldn't agree on much else.

Manufacturers wanted a standard that would be cheap to implement, so their proposed code consisted of five digits that were equal to the item numbers they already used and five digits that would be unique to the manufacturer. Retailers wanted just a five-digit product code that would be quicker to key into an electronic cash register. "The two sides tended to meet, argue, and go home without any resolution," recalled Tom Wilson in an oral history interview recorded by IDHistory.com.

To break the impasse, NAFC president and CEO Clarence Adamy turned to McKinsey & Company, a management consulting firm that frequently worked with the grocery industry, in 1968. McKinsey came back to Adamy a few months later with recommendations for both a product code and a machine-readable symbol to represent it. The first phase of the standardization effort would require five months and \$100,000. Adamy said his group didn't have the money and passed.

Instead, Adamy worked with the heads of five other trade associations in the grocery industry to put together another workgroup to do the job. The Ad Hoc Committee on a Uniform Grocery Product Code consisted of 10 well-respected executives representing the manufacturing, distribution, and retail sides of the business.

What made this standardization workgroup different was the decisionmakers were at the table from the very beginning rather than relying on technical experts who "were not empowered to solve the problem," said Franz in an oral history interview. "This was something that was going to have to be done at a fairly high level." Also, the focus was on resolving

With the standards for the UPC's format and visual representation set, the next challenge was persuading everyone in the grocery industry to use it.

big-picture questions on the economic viability of a standard product code, not on the details of implementing it.

In August 1970, the ad hoc committee met for the first time at a hotel near the end of a runway at Chicago's O'Hare Airport. In addition to advisers they brought from their respective firms, they agreed to hire McKinsey to facilitate the committee's work.

Seven months later, the committee concluded that a 10-digit, all-numeric code would be economically feasible. The first five digits would identify the product manufacturer and be assigned by a central authority. The second five digits would identify the product and be assigned by the manufacturers.

Before Gookin made his big announcement at the Super Market Institute's convention, McKinsey helped drum up support. Wilson and Larry Russell presented the committee's recommendations to dozens of groups of grocery manufacturers and retailers between April and May 1971. They also met one-on-one with the industry's top executives to secure their commitment to the standardization effort — in writing. The last written confirmations came the night before Gookin's speech in Dallas.

Even before the ink was dry on those confirmations, the committee got to work on the visual representation of the UPC. In March 1971, they formed a Symbol Standardization Subcommittee chaired by Alan Haberman, chief executive of a Massachusetts-based supermarket chain, to research and evaluate the alternatives. Seven manufacturers submitted proposals, including RCA, Singer, and Pitney Bowes.

IBM also threw its hat in the ring. Back in the mid-1960s, the company had developed a 60-pound electromechanical behemoth that enabled checkout clerks to enter a code with product information for each item purchased. The company decided not to market the system. "It became obvious that the key entry system wasn't going to pay off," recalled Marvin Mann, former IBM vice president, during an oral history interview. "It would slow down the checkout operation [by] having to key in more digits than just the price."

Then the UPC effort came along. Mann began working with the ad hoc committee while IBM's development team in Raleigh started working on a scanner that would read a symbol.

The evaluation of the proposed UPC symbols and scanners took two years, focusing on both the economic viability of the solutions and how well they met the demands of a typical checkout counter. The symbol had to be as small as possible — 1.5 square inches — so that it wouldn't take up valuable real estate on the package. Yet it had to be repro-

duced easily using current printing techniques and read accurately regardless of how the package was positioned as it moved across the scanner.

Prototype scanners and symbols were tested at Battelle Institute's labs in Columbus, Ohio. At the same time, says Selmeier, grocery manufacturers brought their marked goods to Raleigh to verify on IBM's equipment that they could be scanned properly. "Grocery manufacturers were terrified that they were not going to make good symbols," he notes. "That would reflect poorly on their product."

The subcommittee also insisted on real-world testing at grocery stores. For example, RCA began testing a prototype at a Kroger store in suburban Cincinnati in July 1972.

The evaluation process culminated with three days of presentations to the subcommittee in January 1973. Two months later, the subcommittee agreed upon a version of the bar code developed by a team at IBM that included Joe Woodland, who was still working at the company. A press conference was held in New York to announce the winning symbol in April 1973.

The other leading contender for the UPC symbol was the bull's-eye proposed by RCA. The bar code "could be made smaller than the bull's-eye" yet still was scannable from a variety of angles, recalled Mann during a September 1999 celebration of the UPC's 25th anniversary. "And it was adaptable to widely varying printing requirements, which was the make-or-break issue for any of the proposed symbols."

The bar code could also pack more information into a given space than the bull's-eye. That density did require more computer power to decode, however. IBM's team addressed that issue during its 20-minute presentation to the symbol standardization subcommittee.

"Bob Evans pulled out of his pocket a round silicon disk" the size of a silver dollar, recalls Franz. "He said, 'You're probably wondering just what we are going to do to be able to decode [the UPC symbol]. The power of each integrated circuit on this disk is equal to some of the current moderate sized computers of today. We're going to use this power at each checkout stand.'"

The Chicken-and-Egg Dilemma

With the standards for the UPC's format and visual representation set, the really hard part began: persuading everyone in the grocery industry to use it. According to an analysis by the ad hoc committee's consultant, McKinsey & Company, manufacturers had to mark at least three-quarters of their goods with a bar code in order for the technology to be cost effective. At the same time, at least 8,000 supermarket locations, about one-quarter of



the total in operation, needed to install scanners.

But who would make the costly investment first? In general, when a technology standard is widely adopted, it tends to generate “network externalities” — economic benefits that accrue to users by virtue of the fact that many other parties are also using it. (For instance, the more people who connect to a social media network, the more valuable the service becomes to its users as a means of communicating.) But these benefits accrue over time and require implementation costs upfront.


“Grocery manufacturers did not want to redesign their labels as long as only a few supermarkets had scanners,” explains the University of Missouri’s Emek Basker. “Supermarkets did not want to invest in this expensive technology as long as only a few manufacturers had bar codes on their labels.”

A number of factors helped the bar code reach critical mass. The ad hoc committee spent a lot of time and money winning the support of most grocery manufacturers before the UPC was announced. In the ensuing years, committee members were in positions of power to push the skittish managers back at their corporate offices.

Also, in a convenient twist of fate, the U.S. Food and Drug Administration issued requirements in 1973 for foods with added nutrients or that carried nutritional claims to have additional information on their labels. Since many processed foods were required to have updated packaging, it was easier to justify adding a UPC bar code at the same time.

As for the supermarket chains, store managers weren’t convinced the productivity savings of bar codes would outweigh the substantial costs of implementation, especially at smaller chains. So McKinsey devised a compelling business case that focused on two areas where retailers could achieve short-term, quantifiable savings from implementing the UPC bar code — reduced labor costs at the checkout stand and reduced costs associated with pricing and repricing goods. (The grocery industry was expected to reap \$1.4 billion in “hard” savings, with most of the savings accruing to retailers.) Then, the committee members toured the country to present their case.

McKinsey also identified long-term, harder-to-quantify savings from improvements to processes, such as inventory management. “The grocery manufacturer had much better information,” says Selmeier. “Because of the cost of data collection, all the retailers knew was how many cartons of what product they had shipped to a store.” Still, McKinsey downplayed these “soft” savings since the ad hoc committee knew that retailers would be far more interested in boosting their bottom line immediately.



Beyond the grocery industry, unions opposed the adoption of the UPC bar code because they feared it would lead to a lot of people losing their jobs. Consumer advocates feared that goods would be mispriced and the technology could be used to track people’s purchases.

Eventually, both groups worked together to urge the passage of item pricing legislation. By 1976, California, Michigan, New York, Connecticut, Massachusetts, and Rhode Island required supermarkets with scanners to continue labeling individual items with price stickers.

“The net effect of the legislation was the reduction of potential benefits of the UPC, thereby lengthening the payback period for the investment in scanner technology,” noted a 1999 report by PricewaterhouseCoopers published on the 25th anniversary of the UPC. “With the extremely high cost of capital and unstable economic environment of the late 1970s and early 1980s, a number of grocery chains decided to hold off on investing in the new technology.”

According to the PricewaterhouseCoopers report, it would take a normalization of economic conditions in the latter part of the 1980s as well as a “drop in computing costs, improvements in scanner technology [and the] elimination of price-marking legislation” for scanners to become widely used. When Kmart and Wal-Mart started requiring apparel makers to mark their goods with bar codes during the 1980s, UPC registrations spread like wildfire throughout the broader retail industry.

In a November 2004 paper, economist James Mulligan at the University of Delaware and Nilotpal Das, a former visiting professor at Hood College, examined the adoption of scanners by supermarkets. They concluded that, in certain situations, the diffusion of new technology is slower when it improves the quality of service rather than the cost of production. Typically, a firm is motivated to do something new when it sees competitors reaping cost savings. But when a new technology is actually more expensive but adds value to an existing product, firms may stay on the sidelines if they believe their customers wouldn’t respond to that added value.

This phenomenon was observed in the adoption of expensive high-speed ski lifts during the 1980s and 1990s. Resort owners didn’t install them to reduce their costs but to cater to avid skiers and those who highly valued their time.

Das and Mulligan also found this tendency in the diffusion of scanner technology. During the mid-to-late 1970s when NCR and IBM released their first scanners, stores in higher-income areas were more likely to adopt them, perhaps because some of those stores saw a boost in sales from consumers who placed a high value on their time and liked the faster checkout process. But stores didn’t see lower costs

initially. Especially in communities with lower-income families that value price over speed of service, store managers didn't think scanners were worth the expense. It wasn't until IBM and others released scanners in the 1980s that could read bar codes more accurately — even those that were partially damaged, crinkled, or wet — before supermarkets could reap savings that could be passed along to price-sensitive consumers.

In the subsequent decades, consumers have benefited from the labor savings yielded by the adoption of the UPC bar code. Economist Emek Basker found through her research, detailed in a June 2013 paper, that “grocery prices fell considerably in the first decade of checkout automation. The largest price effects are for produce and meat, perishable items over whose prices store managers tend to have the most discretion.”

Meanwhile, the grocery industry has realized the hoped-for hard savings from reduced labor costs. It has also reaped some of the soft savings related to process improvement. The UPC bar code has empowered grocery retailers, enabling them to design displays to optimize item movement or stock up on a popular item before the manufacturer realizes that it is in high demand.

Grocery manufacturers have been empowered as well. Every time a bottle of Head & Shoulders is scanned by a Wal-Mart associate, information flows from the checkout stand directly to Procter & Gamble. The company uses that information from Wal-Mart to determine if additional shampoo needs to be shipped to a particular location and if the production line needs to be ramped up.

Basker notes, “Bar codes started an entire revolution at the back end of supermarkets.” **EF**

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Check out our October *Economic Brief* Investing over the Life Cycle: One Size Doesn't Fit All

This essay questions the conventional wisdom that young people should invest more heavily in risky assets. Financial advisers commonly recommend this strategy because young investors can expect long-run returns on risky assets to outweigh short-term losses, but the Fed's Survey of Consumer Finances shows that young people generally do not follow this advice. Instead, they invest little or nothing in risky assets initially and increase their holdings gradually as they approach retirement. Economists find that accounting for other risks that young people face can help explain this behavior.

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Take Your Pick on Jobs Stats

BY LISA KENNEY

“Which Estimates of Metropolitan-Area Jobs Growth Should We Trust?” Joel Elvery and Christopher Vecchio, Cleveland Fed *Economic Commentary*, April 1, 2014.

When it comes to unemployment statistics, you can have them fast or you can have them accurate — take your pick. That’s according to a recent *Economic Commentary* from Joel Elvery and Christopher Vecchio at the Cleveland Fed, which examines three different employment estimates across four states and six metro areas in the Fed’s Fourth District to determine which one is the most accurate measure.

The estimates produced by the Bureau of Labor Statistics are the monthly State and Metro-Area Employment, Hours, and Earnings (initial SAE); the annual revision of the initial SAE (final SAE); and the Quarterly Census of Employment and Wages (QCEW).

The initial SAE is the timeliest — it is released five weeks after the end of every month — but the Cleveland Fed finds that it is the least accurate. In fact, the BLS itself cautions against using this measure for analysis because of the heavy revisions it undergoes. It also has a large margin of error and relies on a sample size that is too small to generate accurate estimates. Though it may be hard to resist data that is available so quickly, the authors caution that “wrong data can be worse than no data.”

Another option is the final SAE, the second of two annual revisions of initial SAE data, released four to 15 months after the initial SAE. The final SAE covers up to September of the prior year. This tends to be the most accurate data available. It revises the initial SAE to correlate with the QCEW data and includes an estimate of other kinds of employment, such as self-employment. The authors note that sometimes the revisions are so large, they wipe out the “typical average year-over-year changes in jobs for those metro areas” that may have been reported in the initial SAE.

There is also the QCEW, released four to nine months after the end of a quarter. It is a highly accurate measure that is an actual count of employment and covers 98 percent of all employment. The QCEW has a high correlation rate with the final SAE across both metro areas and states.

In looking at the three measures for margin of error, revision size, and accuracy at both metro and state levels, Elvery and Vecchio conclude — unsurprisingly — that the final SAE is the best choice for employment data. Because the final SAE takes a much longer time to produce, however, the authors acknowledge that there may be times when the initial SAE and the QCEW are the only estimates available. In these cases, they say, “the QCEW is the better choice.”

And although the authors echo the BLS in advising against overreliance on the initial SAE, they note that it may have some use as an early indicator of state-level employment trends.

“The Evolution of U.S. Community Banks and its Impact on Small Business Lending,” Julapa Jagtiani, Ian Kotliar, Romain Quinn Maingi, Philadelphia Fed Working Paper No. 14-16.

In a recent working paper, Julapa Jagtiani of the Philadelphia Fed and co-authors Ian Kotliar and Romain Quinn Maingi of Rutgers University investigate whether the decline in the number of community banks over the last decade has affected small business lending. The authors argue that this is a potential concern because of community banks’ “special role in supporting small businesses in their local communities.”

Between 2001 and 2012, more than 1,000 community banks were acquired by larger institutions or shuttered, while the number of large banks rose from six to 18. Jagtiani, Kotliar, and Maingi define community banks as those with less than \$1 billion in total assets and large banks as having more than \$100 billion in total assets.

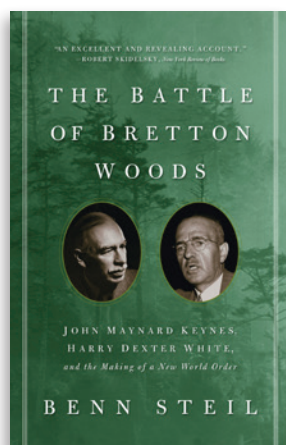
To determine whether acquisitions have affected small business lending, the authors analyze risk characteristics of acquired community banks, compare pre- and post-acquisition performances of those banks, and examine stock market reactions to acquisitions.

So has the decline of community banks eliminated unique support for small businesses and damaged overall small business lending? In short, their answer is no.

The authors find that many of the community banks that were acquired during the 2007-2009 financial crisis had unsatisfactory ratings from regulators and were in poor condition; therefore, “mergers involving community bank targets so far have enhanced the overall safety and soundness of the overall banking system.” And since large banks more than doubled their small business lending market share between 2001 and 2012, the paper finds that these mergers did not have a negative effect on small business lending. “Larger bank acquirers have tended to step in and play a larger role in SBL [small business lending].”

On a policy note, the authors conclude that policies discouraging mergers between large firms and community banks “could result in a potential unintentional effect on the supply of SBL lending.” Allowing these sorts of mergers to continue will result in healthier and more efficient banks overall, they suggest, not just in regard to certain kinds of lending. **EF**

The Birth of Bretton Woods



**THE BATTLE OF BRETTON WOODS:
JOHN MAYNARD KEYNES, HARRY
DEXTER WHITE, AND THE MAKING OF
A NEW WORLD ORDER**

BY BENN STEIL
PRINCETON, N.J.: PRINCETON
UNIVERSITY PRESS, 2013, 370 PAGES

REVIEWED BY ROBERT L. HETZEL

Benn Steil of the Council on Foreign Relations tells the story of the birth of the Bretton Woods system of fixed exchange rates at Bretton Woods, N.H., in July 1944. The United States had already decided on the design of the system in advance. At the actual conference, the American architect of the plan, Harry Dexter White, used his control of the agenda to railroad the American blueprint past the largely parochial and befuddled delegates from the 44 Allied countries represented. The United States wanted a system of international commerce that would allow unfettered access of foreign markets to its ascendant export industry. That meant restricting the ability of foreign countries to devalue their currencies relative to the dollar and to impose tariffs in order to advantage their own export industry.

The Battle of Bretton Woods makes this story of American power both engaging and instructive. It is engaging because of the way in which he portrays the competition over the design of Bretton Woods as a contest between two extraordinarily strong personalities: Harry Dexter White and John Maynard Keynes. It is instructive because of the way in which he uses these two individuals to tell the intellectual history of the first half of the 20th century.

Keynes was 31 years old when, in 1914, the start of World War I brought an end to the international gold standard. The era of the gold standard had encouraged a “classical economics,” which emphasized free trade and free markets. This intellectual orthodoxy associated the international gold standard and its free movement of gold and capital with free trade, laissez-faire, and the quantity theory. In the economic sphere, governments should give free rein to market forces.

In the 1930s, when the world economy crashed, so did support for classical economics among both public and professional economists. The demand was for government to master the destabilizing market forces that had presumably brought down the world economy. At the radical left end,

intellectuals demanded central planning. White gravitated toward this end in principle. Keynes led the right end with his program to manage trade and the economy. Almost no one supported free markets.

The debate over the design of a postwar monetary system played out in this environment. There was a desire to return to the sense of security and stability that had characterized the earlier gold standard era. At the time, the consensus was that such stability required the fixed exchange rates of the gold standard. Earlier, Keynes, in his 1923 book *A Tract on Monetary Reform*, had pointed out that a country had to choose between internal stability of prices and external stability of the foreign exchange value of its currency.

A system of fixed exchange rates (providing for external stability) that precluded recourse to deflation (providing for internal stability) would then build in a fundamental contradiction. Keynes’ design for the postwar system of international payments would have had fixed exchange rates but would have been made to work through “management” by technocrats to avoid deflation. Moreover, Keynes, like other contemporary observers, saw the capital outflows that forced countries on the gold standard, like Britain, into deflation and eventually into devaluations as evidence of the destabilizing influence of market forces rather than as symptoms of monetary disorder. Keynes’ system would have allowed countries like Britain liberal use of devaluations against the dollar and exchange controls in order to deal with trade deficits. This discretionary “management” ran directly counter to the American agenda of wide open markets for American exporters.

In their capacity as negotiators, both Keynes and White pursued the agendas of their respective countries. In his capacity as British negotiator and in his own personal capacity, Keynes wanted to preserve what he could of the old system with London at the center of the world financial system. That meant resisting complete American hegemony. Debate then centered on two issues.

First, what would be the unit of account and the means of payment in the new system? The United States held most of the world’s monetary gold. Also, every country after the war would need dollars to finance the imports required for basic commodities like food and energy and for reconstruction. The United States wanted a system based on gold and the dollar. Keynes wanted an entirely new paper currency, which he called *bancor*, a term combining the French words for bank and gold.

Second, Keynes did not want Britain to be completely dependent on American aid after war. To pay for its postwar imports, Britain would need to export. Keynes wanted Britain to be able to retain its imperial preferences, which restricted the ability of its colonies to import from countries

other than Britain. Steil recounts how earlier in opposing the nondiscriminatory trade clauses contained in the Atlantic Charter, which would have ended the preferences, “Keynes exploded in rage in front of the State Department’s Dean Acheson,” reacting to the “lunatic proposals” of Secretary of State Cordell Hull.

The forceful, combative, yet complex personalities of White and Keynes provide a Technicolor background to the narrative. White wanted to be close to power to exercise influence. Completely apart from the role he played in securing the American agenda at Bretton Woods, White wanted to hasten a new economic order based on the Soviet model of state control. As summarized by Steil, based on an unpublished essay written by White, White believed that after the war the American economic system would move toward the Soviet model. Steil quotes White from the essay, “Russia is the first instance of a socialist economy in action. And it works!”

Keynes could be alternately charming and insolent. He referred to the negotiations at Bretton Woods as the “monkey house.” He said of White, “He has not the faintest conception of how to behave or observe the rules of civilized intercourse.”

In the end, Keynes knew that Britain would be dependent on American aid after the end of the war. During the war, Britain could not sustain its military without Lend-Lease. Assuring Lend-Lease meant cooperating with White, the U.S. Treasury, and the American demand for a postwar monetary order of fixed exchange rates and free trade. Keynes knew he had to accept the White plan and sell it to British politicians.

Benn Steil has written a book full of historical insight and human color. **EF**

Robert L. Hetzel is a research adviser at the Federal Reserve Bank of Richmond.

Expanding Unemployment Insurance *continued from page 21*

and it increased the benefit duration and generosity sharply. Lemieux and MacLeod hypothesized that workers would gradually become aware of the more generous benefits as they were exposed to the program through involuntary unemployment, and over time this would change their incentives to supply labor. From 1972 to 1992, unemployment and UI use trended upward, and the authors found evidence that first-time UI recipients were more likely to use the system again throughout their lifetime.

Evaluating UI

Determining the desirability of UI as a social insurance program involves a number of considerations. As with any insurance program, the possibility of misuse is real. But many labor economists argue that UI does a reasonable job of minimizing moral hazard.

“In order to be eligible for UI, you must have an established job history,” says San Francisco Fed labor economist Robert Valletta. In most states, eligibility for UI is determined based on employment and wages during a 12-month period preceding unemployment. “So, these are people com-

ing from a career who are just trying to stay afloat during a difficult period of dislocation.”

Valletta and Rothstein also argue that UI serves a unique welfare function. In a 2014 working paper, they explored whether households are able to supplement their income from UI using other safety net programs once their eligibility for UI benefits expire. They found that in both the 2001 and the 2007-2009 recessions, once UI benefits were exhausted, family incomes fell significantly and the share of families below the poverty line nearly doubled.

In the end, evaluating UI may depend on how one views its intended purpose. If UI is seen more as a program of social insurance designed to keep middle-class families out of poverty, then it seems to be largely a success. As a program of economic stabilization, the evidence is mixed, especially when one considers the potential long-run costs of expanding benefits for extended periods. It’s also not clear that UI is the best program to deal with every unemployment spell. Ultimately, societies must weigh the negative effects of UI against the benefits when considering changes to the program. **EF**

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The Unconventional Oil and Gas Boom

BY R. ANDREW BAUER

A dramatic shift is taking place in the U.S. energy sector. For decades, analysts and policymakers assumed that as U.S. reserves of oil and natural gas dwindled, domestic production would decrease gradually and imports would increase steadily. But technological advances in extracting oil and natural gas along with higher energy prices have changed those assumptions. U.S. energy production has risen sharply in recent years and is expected to continue to grow at remarkable rates in coming decades — with benefits for the U.S. economy overall as well as within the Fifth District.

One of the most active regions is the Marcellus Shale, which underlies most of West Virginia, western Maryland, and parts of Ohio, Pennsylvania, and New York. The Marcellus Shale is a rock formation located deep beneath the earth's surface that contains vast amounts of natural gas. West Virginia and Pennsylvania have been actively encouraging the development of this resource in recent years, and the growth in production and the impact on local economies has been tremendous. In December 2013, the Marcellus region provided 18 percent of total U.S. natural gas production — a remarkable increase from almost no production just six years earlier. For the local communities at the epicenter of this production boom, the demand for workers and housing has jumped to the point where both are often in short supply. While this transformation of the energy sector is still in its early stages, the potential long-term impact on the regional and national economy is expected to be considerable.

There are a number of concerns surrounding the oil and natural gas boom, particularly its potential effects on the environment and nearby communities. The sector would face regulatory challenges if research indicated that current methods of production create substantial health or environmental risks. The potential benefit of these resources is so great, however, that additional regulations would likely only slow development in the sector.

Unconventional Oil and Natural Gas

The U.S. energy boom is due to the development of “unconventional” oil and natural gas. Unconventional refers to the fact that the oil and gas are trapped in rock formations with very low permeability and alternative methods are needed to extract them. Examples include “tight oil” and “tight gas,” which are found in rock formations such as siltstone, sandstone, limestone, and dolostone; shale gas, which is natural gas found in shale, a fine-grained sedimentary rock with very low permeability; and coalbed methane, which is natural gas found in coalbeds. All of these hydrocarbons are extracted in ways that differ from “conventional” wells where the oil and

natural gas naturally flow or can be pumped from an underground reservoir to the surface.

Three factors came together to make production of unconventional oil and natural gas economically viable: horizontal drilling, hydraulic fracturing, and increases in oil and gas prices. While horizontal drilling and hydraulic fracturing are not new, significant technological advances in recent decades have allowed developers to better target and more efficiently extract the oil and natural gas. The process of horizontal drilling and hydraulic fracturing (commonly referred to as “fracking”) is more expensive than drilling a conventional vertical well, but higher prices for natural gas have made these techniques economically viable. At some of the early unconventional formations (or “plays”), such as the Barnett Shale in Texas or the Bakken formation in Montana and North Dakota, it wasn't until the mid-2000s, after energy prices rose sharply, that there was more widespread usage of horizontal wells and hydraulic fracturing. In the Barnett Shale, one of the nation's most developed shale plays, the number of producing horizontal wells rose from less than 400 in 2004 to more than 10,000 in 2010.

So what exactly is fracking? Fracking involves injecting fluids into rock formations to create fractures in the rock that allow the oil and natural gas to flow through the well to the surface. A horizontal well that utilizes fracking techniques is dug in several stages. The well is drilled vertically to a predetermined depth, depending on the depth of the rock formation, and then the well is “kicked off” or turned at an angle until it runs parallel within the reservoir. The well can extend up to three miles through the reservoir, allowing for a greater number of access points. In drilling the well, several casings are cemented into place to provide stability and to ensure that the fracking fluids and the hydrocarbons do not escape into the surrounding soil.

There has been a lot of controversy surrounding fracking, particularly about its potential impact on the environment. There are concerns that the oil and gas could pollute the groundwater through faulty well design or construction or through migration to the surface. In addition, there are concerns about the fracking fluid used in the process. Fracking fluid is roughly 98 percent water and sand, but the chemicals it contains could pollute drinking water if released. Faulty well design or construction could result in the fluid escaping into the surrounding environment. Improper handling of the fluid that returns to the surface through the well is another issue. This fluid is injected into disposal wells that are thousands of feet underground, but there are concerns that the fluid could migrate upward into groundwater.

There are also concerns related to fracking and earthquakes. According to the U.S. Geological Survey (USGS),

fracking causes earthquakes that are typically too small to be noticed. The USGS has found, however, that the injection of wastewater into disposal wells has the potential to induce larger earthquakes. Of the 40,000 disposal wells in the United States that are related to oil and gas activities, there were roughly a dozen cases where larger earthquakes were detected. The USGS is currently researching the issue to better identify induced earthquakes, understand why they occur in some places but not in others, and determine what should be done once they occur.

Another issue is the amount of stress placed on nearby towns and cities, which typically experience increased traffic, greater use of local water resources, and more air and noise pollution.

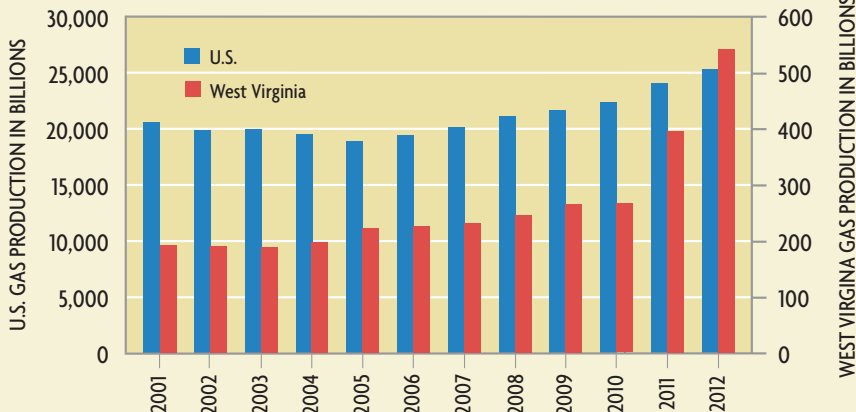
Overall, while there are risks and concerns, there does not appear to be an inherent problem with this particular method of energy extraction. In 2004, the Environmental Protection Agency (EPA) published the results of a study on hydraulic fracturing used in coalbed methane reservoirs to evaluate the potential risks to underground sources of drinking water. The study focused on coalbed methane reservoirs because they are typically closer to the surface and to underground sources of drinking water. The EPA concluded that “the injection of hydraulic fracturing fluids into [coalbed methane] wells poses little or no threat to [underground sources of drinking water].” In 2012, in response to persistent environmental concerns about the surge in fracking, the EPA began a new study to “understand the potential impacts of hydraulic fracturing on drinking water resources.” The agency will release a report for peer review and comment in 2014.

The Boom in Unconventional Production

The boom in unconventional oil and natural gas production is expected to increase in coming years. U.S. tight oil production has increased from under 500,000 barrels per day in 2008 to over 2.5 million barrels in 2013. Total U.S. crude oil production increased from 5 million barrels per day in 2008 to 7.4 million barrels per day in 2013, a 49 percent increase. The U.S. Energy Information Agency (EIA) is forecasting production to reach 9.6 million barrels per day in 2015 — which would match the record U.S. production level reached in 1970. As these formations are slowly exhausted, production is anticipated to then gradually decline in subsequent decades to 7.8 million barrels per day in 2040, slightly higher than 2013 production levels. Notably, as these plays are developed, additional supplies are being found, resulting in sharp increases in proved reserves. Proved oil reserves increased from 19 billion barrels in 2008 to 26.5 billion in 2013, an increase of 39 percent.

The outlook for natural gas is even more astounding (see chart). U.S. shale gas production increased from roughly

Natural Gas Production (Billion Cubic Feet)



SOURCE: U.S. Energy Information Agency

1 trillion cubic feet (tcf) in 2006 to more than 8 tcf in 2012. The EIA expects this trend to continue. Shale gas production is expected to reach 17 tcf by 2040. As a consequence, total natural gas production is forecast to increase from roughly 24 tcf in 2013 to more than 33 tcf in 2040. And as was the case with oil reserves, proved natural gas reserves increased sharply in recent years, from 200 tcf in 2004 to 350 tcf in 2013 — an increase of 75 percent in less than a decade.

With the increase in oil and natural gas production, U.S. energy imports have declined sharply. In 2013, U.S. net energy imports were the lowest in more than 20 years. With an abundance of natural gas, the EIA forecasts the United States to become a net exporter of natural gas in 2015. Total U.S. energy consumption is expected to continue to outstrip total U.S. energy production in coming decades, however, mostly as a result of domestic demand for petroleum outweighing domestic production. Yet the gap between production and consumption is expected to narrow considerably. Total energy production is forecast to satisfy all but 3 percent of total consumption by 2034 — a significant improvement from a 16 percent gap in 2012.

Economic Benefits of the Boom

The benefits from greater U.S. production of oil and natural gas are expected to be extensive and long-lasting. There already has been strong growth in the energy sector from increased extraction, distribution, and refining. Much of that growth has been centered in the regional economies where there is active exploration and extraction. In many of the areas where there are active shale plays — including parts of North Dakota, Montana, and Texas — unemployment rates are among the lowest in the country.

The benefits from energy extraction are not limited geographically, however. Many upstream and downstream industries located across the country have benefited, including the fabricated metal industry, pipe manufacturers, machining industry, oil and natural gas equipment manufacturers, and truck and construction equipment manufacturers.

The production boom in natural gas in recent years also has resulted in lower natural gas prices. The price of natural gas in the United States averaged \$3.76 per 1 million Btu (British thermal unit) over the past three years, compared with \$10.15 in Europe and \$13.88 in Japan. According to the EIA, nearly half of household energy consumption in 2009 was in the form of natural gas while roughly 30 percent of energy consumption in 2010 in the manufacturing sector was natural gas. In addition, 27 percent of electricity was generated using natural gas in 2013 — a percentage that has been increasing in recent years as electrical power companies have been switching away from coal in favor of natural gas by converting old coal-fired units to natural gas ones, shutting down coal-fired plants, and expanding capacity at existing natural gas plants or building new ones. Lower natural gas prices result in lower costs to generate electricity and lower electricity prices that benefit consumers, businesses, and manufacturers. Manufacturers in energy-intensive industries such as refining, iron and steel, cement, food, and chemicals stand to gain even greater benefits from lower electricity costs.

Energy-related chemical industries are also likely to benefit greatly from the boom in natural gas production. Natural gas liquids such as ethane, propane, and butane (known as associated gas or “wet gas”) are found in some natural gas reservoirs. These liquids are key chemicals that are used

widely in a number of manufacturing industries. Ethane and propane can be processed into ethylene and propylene, which are found in a myriad of consumer products including food packaging, bottles, trash bags, toys, tires, carpets, insulation, and clothing, as well as in construction materials such as siding and PVC. Natural gas or natural gas liquids are used to produce ammonia, plastics, fibers, pesticides, dyes, and other chemicals, as well as many household cleaning solutions. Greater production of natural gas and natural gas liquids have resulted in lower prices for these key chemical components. Given the disparity between natural gas prices in the United States and the rest of the world, chemical manufacturers in this country are likely to enjoy a cost advantage against their overseas competitors.

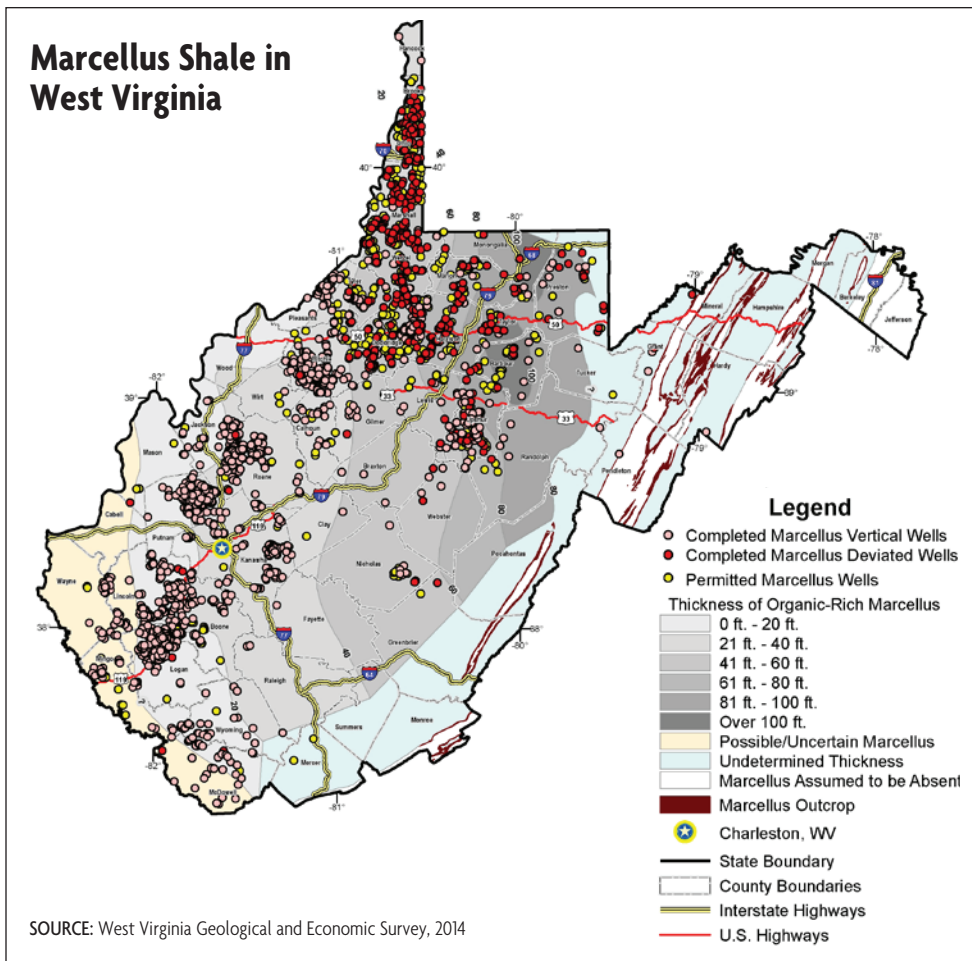
The Natural Gas Boom in the Fifth District

The Fifth District has experienced the oil and gas boom in recent years as a result of the Marcellus Shale in West Virginia (see map). The natural gas sector has seen a dramatic increase in production in recent years, and those areas of the state where most of the exploration and production is taking place have seen a significant pickup in economic activity, including business creation and job growth. In addition, given the importance of natural gas and natural gas liquids to the chemical industry, the higher output of natural

gas may drive additional investment in chemical production, which, in turn, would attract additional manufacturers to the state.

Natural gas production in West Virginia increased 140 percent between 2006 and 2012. It rose by 39 percent in 2012 alone, in part due to infrastructure improvements that allowed producers increased access to markets. Within the Marcellus Shale, the number of producing wells rose from 19 in 2006 to over 1,250 in 2012, and the amount of natural gas produced increased from less than 100 million cubic feet in 2006 to roughly 330,000 million cubic feet in 2012. Although an insignificant contribution to total production in 2006, Marcellus Shale gas represented 62 percent of all natural gas produced in West Virginia in 2012. Over this time period, production from horizontal wells soared from less than 1 percent of total production in 2006 to 84 percent in 2012.

While this is a dramatic increase, most of the new production has come from a relatively concentrated area in the northern



West Virginia Oil & Gas Sector

	Employment				Average Salary (in 2013 dollars)			
	2007	2013	'07 - '13 % change	'03 - '13 % change	2007	2013	'07 - '13 % change	'03 - '13 % change
Total (All Industries)	569,774	564,746	-0.9	4.1	37,697	39,519	4.8	6.5
Oil and Gas Extraction	2,442	2,439	-0.1	40.7	65,553	81,970	25.0	45.1
Support Activities for Oil and Gas Operations	2,496	4,463	78.8	189.8	49,902	68,081	36.4	50.8
Natural Gas Distribution	917	742	-19.1	-29.9	75,181	64,559	-14.1	-11.3
Oil and Gas Pipeline Construction	965	3,247	236.5	356.0	60,889	80,183	31.7	76.5
Total Oil & Gas Sector	6,820	10,891	59.7	115.9	62,881	73,698	17.2	34.1
Oil & Gas: % of Total	1.2	1.9			167	186		

SOURCE: Bureau of Labor Statistics

part of the state. The top natural gas producing counties in West Virginia in 2012 — Harrison, Wetzel, Doddridge, and Marshall — accounted for roughly two-thirds of all Marcellus Shale production. The nearby counties of Upshur, Taylor, Marion, Tyler, Monongalia, and Ohio combined for another 17 percent of production in 2012.

The oil and gas sector has been a source of growth for the state economy with gains in employment, wages, and business establishments (see table). Between 2007 and 2013, total employment in the oil and natural gas sector increased from 6,820 to 10,891, an increase of 60 percent. In comparison, total employment in the state went down by 5,028 jobs, or 0.9 percent, during that period. Within the oil and gas sector, the gains were concentrated in two key subsectors: support activities for oil and gas operations, which increased 79 percent, and oil and gas pipeline construction, which rose to 3,247 jobs from 965 in 2007. Other subsectors within the energy sector saw no growth or experienced a loss, however. Employment in oil and gas extraction was flat over the period, while employment in natural gas distribution declined by 175 jobs, or 19 percent.

Wage growth in the energy sector also outpaced the statewide average. In 2007, the average salary in West Virginia was \$37,697 (in 2013 dollars), while the average wage in the energy sector was \$62,881, roughly 1.7 times greater. The average wage in the energy sector rose 17 percent from 2007 to 2013, considerably faster than the 4.8 percent increase for the average wage across all industries. And just as employment growth was greatest in support activities for oil and gas operations and oil and gas pipeline construction, average salary growth was greatest in those sectors as well. In the oil and gas operation support sector, the average salary rose 36 percent; in pipeline construction, the average salary rose 32 percent and, at \$80,183, was more than twice the state's average salary of \$39,519 in 2013.

Similarly, business creation in the energy sector outpaced the overall economy. The number of establishments in the energy sector grew by 30 percent from 2007 to 2013, compared with 2.1 percent for the state overall. And as was the case with job and wage growth, the strongest increases were in support activities for oil and gas operations and oil and gas pipeline construction sectors, up 54 percent and

94 percent, respectively.

While gains in employment, wages, and business creation in the energy sector occurred throughout the state, the northern half of the state saw the greatest benefits. The unemployment rate in West Virginia in 2013 was 6.5 percent, considerably less than the 7.4 for the United States, in large part due to the boom in oil and natural gas. The unemployment rate for the top 10 natural gas-producing counties in the northern half of the state was 5.5 percent, well below the state average.

West Virginia's chemical industry also is expected to benefit from increased Marcellus Shale gas and natural gas liquids production. The West Virginia manufacturing sector has a relatively high concentration of chemical manufacturing, particularly in the resin, rubber, and artificial fibers sector, as well as in basic chemical manufacturing. There are 90 chemical manufacturing establishments in West Virginia, including 45 in basic chemical manufacturing and 11 in resin, rubber, and artificial fibers manufacturing. Many of the largest chemical manufacturing companies in the world have a presence in West Virginia, including Dow Chemical, DuPont, Bayer, SABIC, and Braskem. With the prospect of a steady supply of cheap natural gas and natural gas liquids, additional investment in the chemical industry is expected in the coming years and decades.

Conclusion

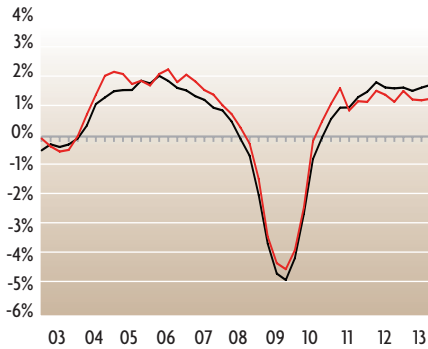
The unconventional oil and natural gas boom has reversed the outlook for the U.S. energy sector. Instead of decreasing levels of production and reserves, U.S. energy production has jumped in recent years and is expected to continue to increase, with oil production reaching highs not seen since the 1970s and the United States becoming a net natural gas exporter. Since natural gas is widely used across sectors, the prospect of relatively inexpensive natural gas may translate to broad gains for the U.S. economy. Greater production of natural gas liquids and natural gas, for example, will allow the U.S. chemical industry to enjoy cheaper input costs and a relative cost advantage over its competitors overseas. With the Marcellus Shale in West Virginia, the Fifth District is squarely in the center of this transformation of the energy sector. **EF**

STATE DATA, Q4:13

	DC	MD	NC	SC	VA	WV
Nonfarm Employment (000s)	747.9	2,604.2	4,100.0	1,916.8	3,766.9	764.5
Q/Q Percent Change	0.2	0.3	1.1	0.9	0.0	0.2
Y/Y Percent Change	0.8	0.7	2.2	2.4	0.2	0.0
Manufacturing Employment (000s)	0.9	105.3	442.8	228.4	229.3	48.5
Q/Q Percent Change	-13.3	-0.8	0.2	1.7	-0.6	-0.2
Y/Y Percent Change	-13.3	-1.9	0.2	3.1	-0.9	-0.3
Professional/Business Services Employment (000s)	155.7	418.4	563.0	239.6	668.2	65.3
Q/Q Percent Change	-0.2	0.5	2.1	-1.2	-1.3	0.3
Y/Y Percent Change	-0.1	1.0	5.0	0.5	-2.1	1.4
Government Employment (000s)	239.0	503.0	719.5	352.5	709.9	154.9
Q/Q Percent Change	0.3	-0.1	1.4	0.4	-0.1	0.3
Y/Y Percent Change	-1.7	-0.4	0.1	1.3	-0.3	0.4
Civilian Labor Force (000s)	367.7	3,110.2	4,666.5	2,170.6	4,234.8	790.1
Q/Q Percent Change	-0.1	-0.4	-0.4	-0.4	-0.1	-0.5
Y/Y Percent Change	-1.3	-0.9	-1.2	-0.7	0.1	-2.1
Unemployment Rate (%)	7.8	6.2	7.2	6.8	5.3	6.2
Q3:13	8.3	6.6	7.9	7.5	5.6	6.5
Q4:12	8.7	6.9	9.0	8.5	5.8	7.2
Real Personal Income (\$Bil)	45.0	299.9	355.9	159.9	375.5	61.5
Q/Q Percent Change	0.1	0.2	0.6	0.6	0.1	-0.1
Y/Y Percent Change	-0.3	-0.5	0.9	1.2	-0.9	-0.5
Building Permits	963	4,308	12,330	5,653	5,713	425
Q/Q Percent Change	-11.0	-13.7	2.6	-9.6	-29.2	-31.1
Y/Y Percent Change	-38.3	10.9	-4.2	23.7	-16.6	-12.6
House Price Index (1980=100)	656.2	414.5	305.1	306.7	402.5	220.3
Q/Q Percent Change	0.8	0.4	0.0	-0.1	0.4	0.1
Y/Y Percent Change	9.9	2.1	1.2	0.8	1.6	1.7

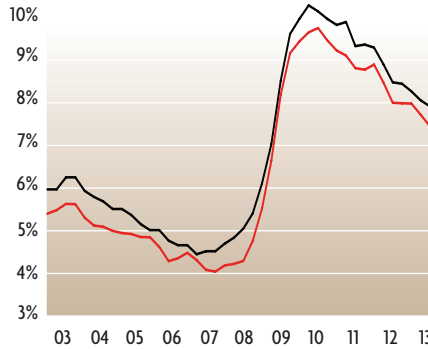
Nonfarm Employment

Change From Prior Year
Fourth Quarter 2002 - Fourth Quarter 2013



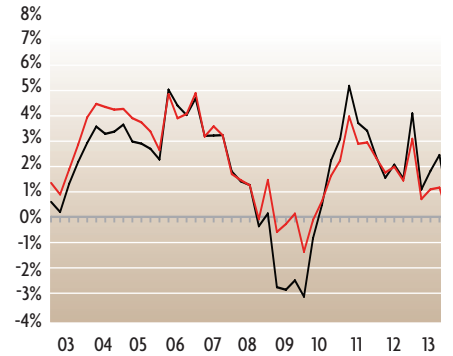
Unemployment Rate

Fourth Quarter 2002 - Fourth Quarter 2013



Real Personal Income

Change From Prior Year
Fourth Quarter 2002 - Fourth Quarter 2013

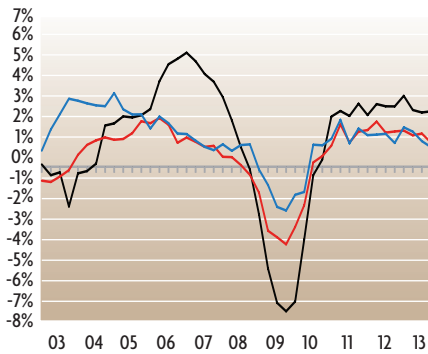


— Fifth District

— United States

Nonfarm Employment Major Metro Areas

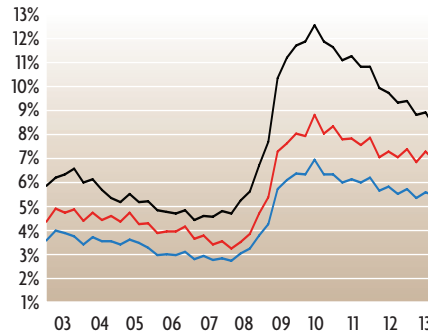
Change From Prior Year
Fourth Quarter 2002 - Fourth Quarter 2013



— Charlotte — Baltimore — Washington

Unemployment Rate Major Metro Areas

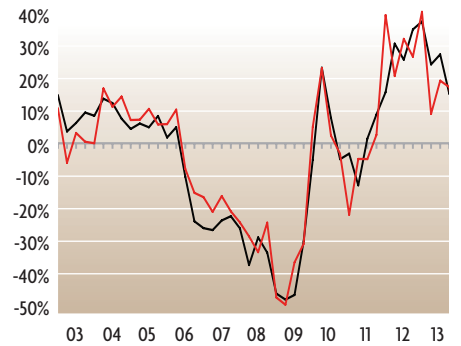
Change From Prior Year
Fourth Quarter 2002 - Fourth Quarter 2013



— Charlotte — Baltimore — Washington

Building Permits

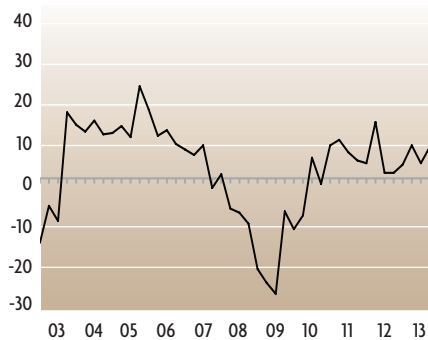
Change From Prior Year
Fourth Quarter 2002 - Fourth Quarter 2013



— Fifth District — United States

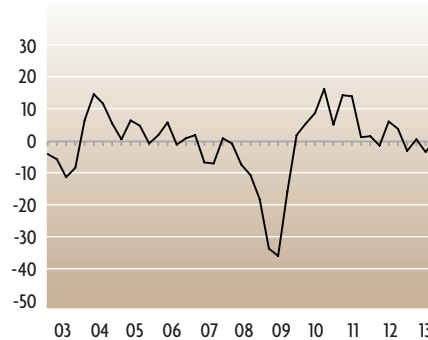
FRB—Richmond Services Revenues Index

Fourth Quarter 2002 - Fourth Quarter 2013



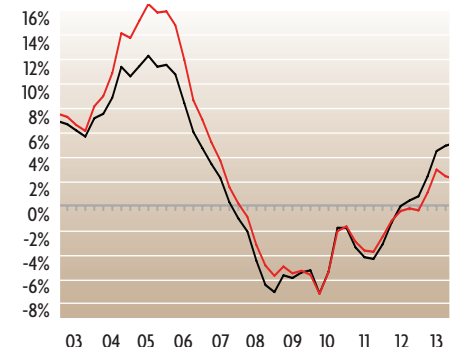
FRB—Richmond Manufacturing Composite Index

Fourth Quarter 2002 - Fourth Quarter 2013



House Prices

Change From Prior Year
Fourth Quarter 2002 - Fourth Quarter 2013



— Fifth District — United States

NOTES:

- 1) FRB-Richmond survey indexes are diffusion indexes representing the percentage of responding firms reporting increase minus the percentage reporting decrease. The manufacturing composite index is a weighted average of the shipments, new orders, and employment indexes.
- 2) Building permits and house prices are not seasonally adjusted; all other series are seasonally adjusted.

SOURCES:

Real Personal Income: Bureau of Economic Analysis/Haver Analytics.
 Unemployment Rate: LAUS Program, Bureau of Labor Statistics, U.S. Department of Labor, <http://stats.bls.gov>.
 Employment: CES Survey, Bureau of Labor Statistics, U.S. Department of Labor, <http://stats.bls.gov>.
 Building Permits: U.S. Census Bureau, <http://www.census.gov>.
 House Prices: Federal Housing Finance Agency, <http://www.fhfa.gov>.

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

METROPOLITAN AREA DATA, Q4:13

	Washington, DC	Baltimore, MD	Hagerstown-Martinsburg, MD-WV
Nonfarm Employment (000s)	2,507.1	1,328.9	104.3
Q/Q Percent Change	0.8	1.8	0.7
Y/Y Percent Change	0.5	1.5	0.3
Unemployment Rate (%)	5.1	6.4	6.7
Q3:13	5.4	6.7	7.0
Q4:12	5.6	7.2	7.8
Building Permits	5,575	1,349	234
Q/Q Percent Change	-3.1	-43.9	-9.7
Y/Y Percent Change	-12.8	-21.3	-7.1

	Asheville, NC	Charlotte, NC	Durham, NC
Nonfarm Employment (000s)	178.0	892.0	289.9
Q/Q Percent Change	2.2	2.6	2.6
Y/Y Percent Change	2.7	2.4	2.1
Unemployment Rate (%)	5.5	7.2	5.5
Q3:13	6.1	7.9	6.0
Q4:12	7.3	9.1	7.0
Building Permits	371	4,156	689
Q/Q Percent Change	-11.2	42.8	-48.2
Y/Y Percent Change	40.0	33.6	32.8

	Greensboro-High Point, NC	Raleigh, NC	Wilmington, NC
Nonfarm Employment (000s)	351.3	555.1	143.4
Q/Q Percent Change	2.2	2.2	0.3
Y/Y Percent Change	1.2	4.0	2.7
Unemployment Rate (%)	7.5	5.7	7.3
Q3:13	8.2	6.2	8.1
Q4:12	9.4	7.3	9.2
Building Permits	493	3,092	1,028
Q/Q Percent Change	-26.0	32.6	12.0
Y/Y Percent Change	24.5	-36.0	52.5

	Winston-Salem, NC	Charleston, SC	Columbia, SC
Nonfarm Employment (000s)	211.5	311.9	366.4
Q/Q Percent Change	2.1	-0.1	1.8
Y/Y Percent Change	1.9	1.1	0.9
Unemployment Rate (%)	6.6	5.7	6.1
Q3:13	7.2	6.2	6.7
Q4:12	8.5	6.9	7.4
Building Permits	201	1,069	892
Q/Q Percent Change	-66.6	-16.9	-2.0
Y/Y Percent Change	26.4	2.6	1.7

	Greenville, SC	Richmond, VA	Roanoke, VA
Nonfarm Employment (000s)	317.4	639.1	160.0
Q/Q Percent Change	1.7	0.8	0.9
Y/Y Percent Change	2.8	0.8	0.4
Unemployment Rate (%)	5.7	5.5	5.4
Q3:13	6.3	5.8	5.8
Q4:12	7.0	6.2	6.0
Building Permits	660	970	166
Q/Q Percent Change	-17.7	-40.1	52.3
Y/Y Percent Change	-2.7	-22.1	58.1

	Virginia Beach-Norfolk, VA	Charleston, WV	Huntington, WV
Nonfarm Employment (000s)	752.9	145.6	115.5
Q/Q Percent Change	-0.9	-0.4	2.6
Y/Y Percent Change	0.0	-1.4	0.2
Unemployment Rate (%)	5.7	5.6	6.7
Q3:13	6.0	5.8	7.0
Q4:12	6.3	6.8	7.2
Building Permits	811	24	50
Q/Q Percent Change	-67.6	-52.9	163.2
Y/Y Percent Change	-27.6	-36.8	525.0

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

Moral Hazard and Measurement Hazard

BY JOHN A. WEINBERG

One of the most fundamental features of insurance markets is the possibility that providing insurance against a specific hazard will increase the incidence of the hazard being insured. Someone who is at least partially protected from a specific loss will generally have a reduced incentive to take costly actions to avoid the loss — the consequence being a higher probability of a loss than if there were no insurance. This phenomenon has long been recognized by practitioners of insurance and academics who study insurance markets as the “moral hazard problem.”

If the term sounds a bit, well, moralistic, that’s because it’s an old term and may have originally been used to describe things that we might be more likely to see in moral terms — intentionally setting a fire to make a fraudulent insurance claim, for instance. But in its modern usage, it applies more broadly to the incentive effects of insurance, including cases in which moral judgment might not be so obviously called for. Risk avoidance is costly, and neither maximum avoidance (which you would tend to get with no insurance) nor minimal avoidance (resulting from full insurance) is likely to represent the most efficient insurance contract.

This basic trade-off between incentives for risk avoidance and financial protection against risk shows up in any insurance setting, including those in which insurance is provided by the public sector. Deposit insurance for banks generally makes banks and their creditors less likely to pay attention to risks that could lead to balance sheet losses — pushing the banking industry at least somewhat in the direction of a greater probability of suffering losses. And unemployment insurance (UI) affects the job-seeking incentives of the unemployed, pushing the labor market at least somewhat in the direction of more unemployment.

In the unemployment case, as in any other, reasoning about the direction of the effect on incentives is one thing. Discerning the magnitude of the effect is more difficult. The question in the case of UI, especially since the Great Recession, is whether and to what extent insurance benefits — and in particular, extended benefits — have affected employment. During the Great Recession, the federal government extended the maximum duration for unemployment benefits to 99 weeks in most states. Thus far, studies have found fairly modest effects from this change on unemployment: It appears to have contributed between one-tenth and one-half of a percentage point to the overall unemployment rate. (See “Expanding Unemployment Insurance,” p.20).

Here in the Fifth Federal Reserve District, effective July 1, 2013, North Carolina’s legislature dramatically reduced

its UI benefit payout and duration. Consequently, North Carolina became ineligible for federal extended UI benefits six months before they expired for the rest of the country. This has invited comparisons between North Carolina’s labor market performance and the performance of other states with access to extended UI.

Supporters of North Carolina’s decision argue that the swift decline in its unemployment rate since July 2013 is evidence that cutting UI benefits reduced moral hazard and prompted unemployed individuals to more actively seek work. But critics of the cuts note that labor force participation in North Carolina also fell during the same period, suggesting that some job seekers who lost UI benefits gave up

looking rather than found work. They also note that North Carolina’s performance was similar to neighboring states that did not cut benefits early.

In this debate, a few words of caution are in order. First, and most broadly, it’s always tricky to draw conclusions from a single example.

North Carolina’s labor market is a small sample within the whole United States, and attempting to apply its experience to the other 49 states is unlikely to provide enough evidence to conclusively determine the effects of extended UI. Second, problems analyzing data tend to grow as geographic coverage shrinks, especially in the case of unemployment numbers. The Current Population Survey used by the Bureau of Labor Statistics to track unemployment relies on a sample of households designed to be representative of the entire country. Disaggregating these data to estimate state-level statistics introduces some imprecision. Furthermore, labor market data at the state level are often more “noisy” than countrywide data. For example, decisions by a single major employer can have a large impact on state employment and mask the effects of policy changes like adjustments to UI.

Finally, it’s important to bear in mind that assessing the effects of extended UI benefits on overall employment is one input to, but not the same thing as, assessing the desirability of that policy. If society places greater value on UI as a means to improve the welfare of the involuntarily unemployed, it may be more willing to tolerate some broader negative effects like increased unemployment duration. As with all insurance problems where there is an element of moral hazard, an optimal insurance scheme is one that weighs the benefits of cushioning the insured from some losses against the costs of altered incentives.

EF

John A. Weinberg is senior vice president and director of research at the Federal Reserve Bank of Richmond.

Assessing the effects of extended UI benefits is not the same thing as assessing that policy’s desirability.

NEXT ISSUE

Dropouts

The economic case for finishing high school is overwhelming: Dropouts, on average, face higher unemployment, lower wages, and poorer health. Yet one in five U.S. high school students fails to graduate on time. The evidence indicates that policies to solve the dropout problem must start long before high school.

Minimum wage

Calls to raise the minimum wage are commonplace. But does a higher minimum wage actually make low-income workers better off? Economists used to be nearly unanimous that it would increase unemployment. Today, the profession isn't quite as sure, but it still may not be an effective antipoverty tool.

Colonial-era land speculation

When history books talk about the motivating factors of the American Revolution, they typically focus on tax issues. But in the 1760s and 1770s, Britain's attempts to curb land speculation in the trans-Appalachian region became a major threat to the political rights and economic interests of the Colonial elite.

Federal Reserve

Financial reporters often sound a lot like bird watchers, classifying Fed officials as hawks or doves. Hawks are assumed to be more worried about the inflation side of the Fed's dual mandate, while doves are portrayed as being more concerned about unemployment. Where did these terms come from, and do they accurately portray the disagreements among monetary policymakers?

Policy Update

The U.S. Justice Department's "Operation Chokepoint" initiative is intended to crack down on banks doing business with industries potentially engaged in fraud or illegal activities. But it has drawn criticism from lawmakers and affected industries, such as payday lenders, who argue that the Justice Department is targeting disfavored, but legal, entities.

Interview

Dani Rodrik, an economist at the Institute for Advanced Study, discusses globalization, development, and factors that make governments more likely to implement successful economic policies. (Editor's Note: This interview, which was originally scheduled to appear in the present issue, will run in the next issue.)

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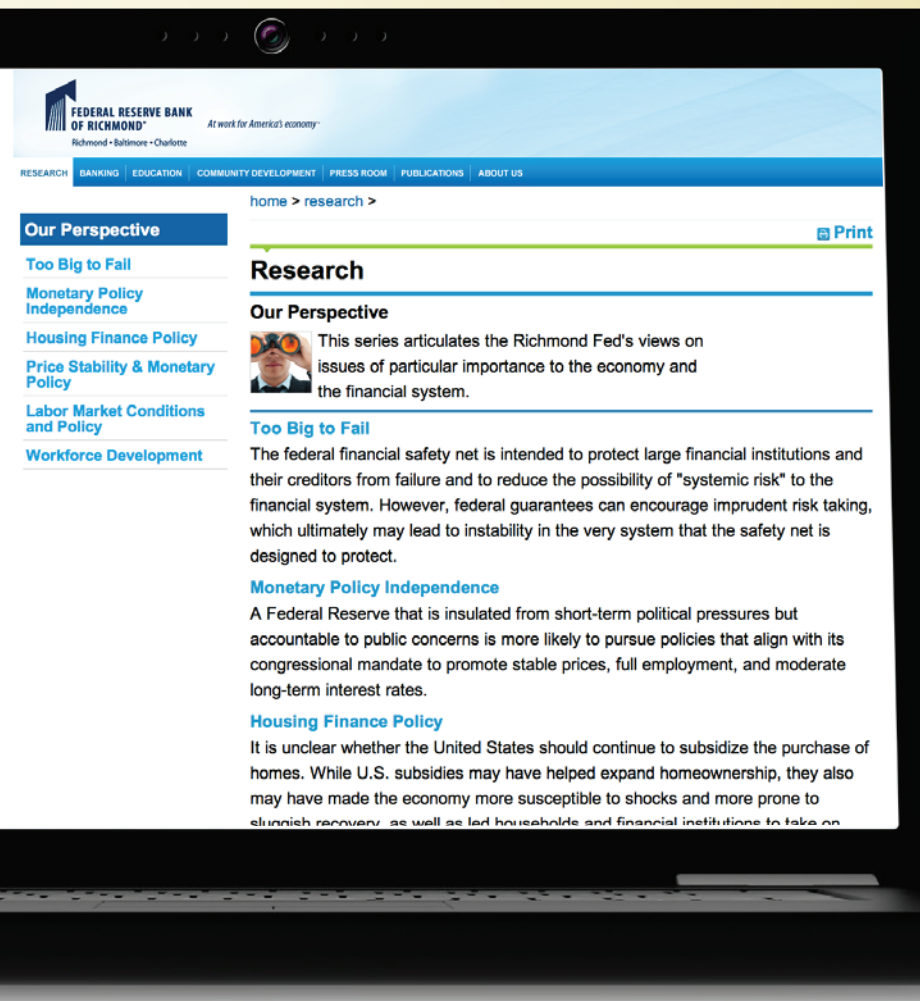
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