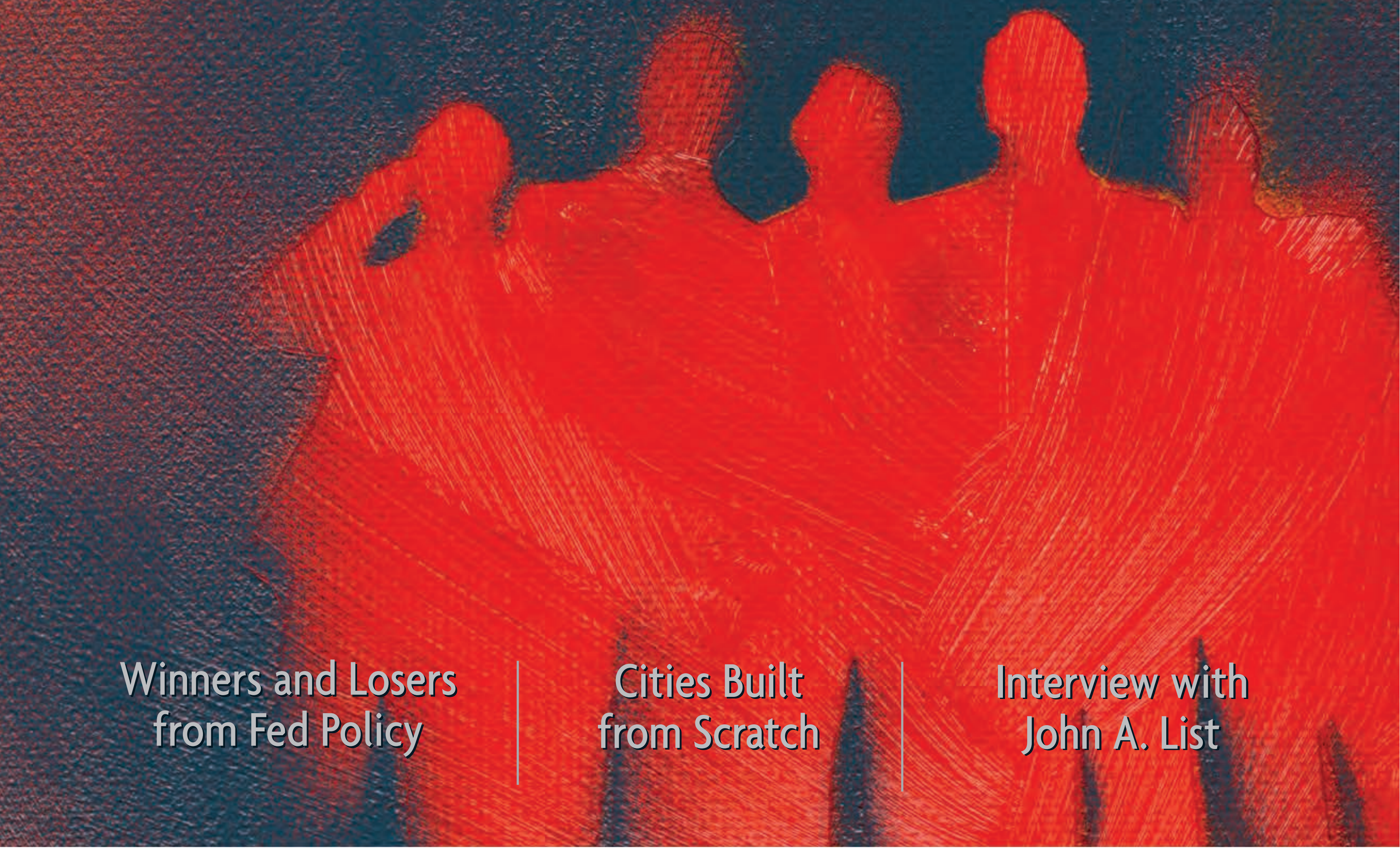
SECOND/THIRD QUARTER 2012

REGION FOCUS

THE FEDERAL RESERVE BANK OF RICHMOND

WHERE HAVE ALL THE WORKERS GONE?



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CONTRIBUTORS
Jake Blakewood
Charles Gerena
Ann Macheras
John Merline
Karl Rhodes
Seth Rubinstein
Sonya Ravindranath Waddell

DESIGN
ShazDesign

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The Importance of Bankers on the Richmond Fed's Board

Like many organizations, the Richmond Fed has a board of directors. Actually, we have three: one for the Bank as a whole and one for each of our branch offices in Baltimore and Charlotte. Historically, the directors of those boards have come from a wide range of backgrounds, including businesses representing sectors across the economy, nonprofit groups, labor organizations, and academia. Among the directors on our Bank-wide board, almost invariably, are three chief executives of Fifth District banks. Why do we, an institution responsible for regulating banks, have bankers on our board?

This question has both a short answer and a somewhat longer answer. The short answer is that federal law dictates that six board members of every Federal Reserve Bank are elected by its member banks. Of these six, three are commonly bankers, while three must be non-bankers. These directors are known as "class A" and "class B" directors, respectively. For voting purposes, the banks in the District are classified according to their amount of capital into categories of small, medium, and large; banks in each category elect one class A director and one class B director. The other three directors, known as "class C," are appointed by the Fed's Board of Governors. (Still another set of legal rules determines the selection of the boards of directors for our Baltimore and Charlotte branches.)

But why does the law provide for bankers potentially to make up a third of a Federal Reserve Bank's board? That's where the longer answer comes in.

Directors play two roles in the life of a Federal Reserve Bank. First, the board carries out the classic corporate governance function, overseeing the Bank's operations, budgets, and strategic direction. It manages the Bank's internal audit program. It appoints the Bank's president and first vice president, subject to the approval of the Board of Governors. For these roles, because some of our operations (particularly in the payments area) resemble the operations of private-sector banks, directors from the banking sector bring helpful and unique expertise to our board.

Second, the directors of a Federal Reserve Bank assist the Bank in its function of funneling economic information about the region into national policymaking. At the Richmond Fed, the observations of our directors, together with data from our Research Department's detailed surveys of business activity, provide us with a snapshot of the economic conditions in the diverse communities around our District. Like other Federal Reserve Bank presidents, I use this information in combination with research on important policy issues affecting the macroeconomy to inform the perspectives that I bring to meetings of the Federal Open Market Committee. All of our directors — from the banking, non-banking, and nonprofit sectors — provide valuable and complementary points of view in this regard. Yet if I were to go to a midsized city in our District and look for an individual who knows as much as possible about the area's economy, there's a good chance that person would be a banker, since bankers tend to have exposure to a diverse range of economic sectors.

How, then, do we avoid the conflicts of interest that could occur from having leaders of regulated companies on our board? Our governance structure is carefully designed to involve board members only in functions in which it is appropriate for them to be involved. Class A directors — the category that may include bankers — do not participate in the appointment of the Bank's president and first vice president, or in the appointment or compensation of any Bank officers whose primary duties involve bank supervision. No board members take part in making supervisory policy, which is determined by the Fed's Board of Governors. Nor are board members permitted to become involved in the consideration of any supervisory matters or to receive confidential information about supervisory matters. These federal laws are, of course, treated seriously by all of us — Federal Reserve Bank leaders, directors, and supervisory staff.

In my experience, the rules laid down by Congress on the composition of Federal Reserve Bank boards and their powers have benefited the public by bringing the views of longtime bankers to the boards' deliberations, while ensuring that supervisory actions such as bank examination ratings and assessments of applications are free of improper influence. And we at the Richmond Fed are mindful that the integrity of our processes — both in reputation and in reality — is essential to protecting the stability of and the public's confidence in the U.S. financial system. **RF**

JEFFREY M. LACKER
PRESIDENT
FEDERAL RESERVE BANK OF RICHMOND

Regional News at a Glance

Power Partners
Post-Merger, Duke Faces More Scrutiny

It's official: The nation's biggest utility is now based in Charlotte, N.C. Duke Energy Corp. absorbed Progress Energy Inc. of Raleigh in July.

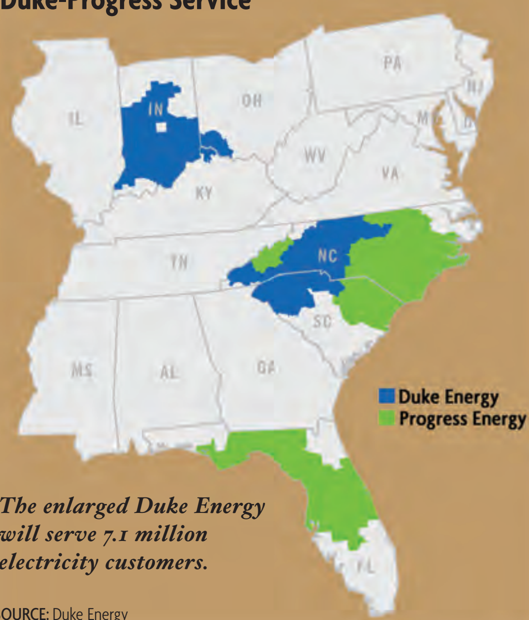
The enlarged Duke will serve 7.1 million electricity customers — 3.2 million in North Carolina, the rest in South Carolina, Florida, Indiana, Kentucky, and Ohio.

In North Carolina, Duke's rates are currently lower than Progress' rates, so, for now, Duke Energy Carolinas and Progress Energy Carolinas will operate as separate subsidiaries. "Once they integrate, take care of cost cutting, and eliminate redundancies, and once Duke Carolinas and Duke Progress Energy rates are on par with each other, they'll merge," says utilities lawyer Chris Ayers of Poynter Spruill, a Raleigh law firm.

Retail electricity rates in North Carolina are regulated by the North Carolina Utilities Commission (NCUC), and determined by firm investments and operating expenses, among other factors. The merger puts the regulated share of Duke's businesses at 85 percent, up from 75 percent.

Cost savings from combined generating systems will lower fuel and borrowing costs, and are expected to save customers an estimated $650 million over five years. Despite the touted cost savings, and falling coal and natural gas prices, Duke wants rate increases later this year to cope with costs of plant upgrades and replacements and stricter environmental rules. The NCUC approved a 7.2 percent hike earlier this year.

Duke-Progress Service



The enlarged Duke Energy will serve 7.1 million electricity customers.

SOURCE: Duke Energy

Electric utilities' costs may be rising, but demand growth has been fairly flat, rising 0.7 percent annually from 2000 to 2010, according to the U.S. Energy Information Administration. Projections call for rebounding but still slow demand growth because of higher energy prices and conservation.

Duke and Progress had to modify merger plans to assure the Federal Energy Regulatory Commission (FERC), which regulates wholesale generation, that competition would not be diminished in North Carolina. The approved plan includes seven new transmission lines designed to create more competitive wholesale markets. This allows outside providers to sell in North Carolina, according to Duke spokesman Dave Scanzoni. Construction costs are estimated at $110 million over two to three years. Until then, Duke will sell electricity to new market participants through purchase agreements with energy trading companies.

A number of cities in eastern North Carolina opposed the merger because they buy power wholesale and sell it to their customers. They worry about Duke's market power. Their opposition was rooted in the 1970s decision to help finance two nuclear plants for Progress' predecessor company, Carolina Power & Light. This bought them a minority stake in the plants to help meet expected power demand at a time when wholesale electricity rates and interest rates were rising. But cost overruns, especially at the Shearon Harris nuclear plant, combined with high debt service, haunt their customers' electricity rates today. Those customers pay an average of $136 per month compared to the $104 average that Progress Energy residential customers pay. The cities buy additional power under a long-term contract from Progress, and so competition really matters. "Their [the cities'] view was you've cut competition in half," Ayers says.

The City of New Bern and the City of Rocky Mount have asked the FERC to re-hear the merger case. "Our ability to compete for lower cost electricity will be smaller with the merger," says New Bern Mayor Lee Bettis.

The cities' Washington, D.C., attorney, John Coyle, says the FERC underestimated Duke's dominance. "What our complaint is about is how you measure the increase in market concentration due to the merger," he says. "The FERC understated market concentration and therefore understated what the company had to do to fix it."

Duke contends that the new transmission lines will bring competition from outside sellers.

The acquisition also brought controversy over a leadership switch. Former Progress Energy chief executive Bill Johnson was slated to head the new Duke Energy. However, Duke's former chief executive Jim Rogers replaced Johnson shortly into the first post-merger board meeting. NCUC chairman Edward Finley stated at a July 10 hearing that the commission is investigating why the leadership changed "within hours of the close of the transaction and what ramifications or repercussions might result from these unexpected and unanticipated events." Duke Energy Corp.'s lead director Ann Gray testified in the hearing that the company's board acted appropriately.

— Betty Joyce Nash

Technology Transfer

D.C. and Baltimore Areas Vie with Silicon Valley in Tech Jobs

Recently *Forbes* ranked the Washington, D.C., and Baltimore, Md., metro areas ahead of Silicon Valley on its annual list of best cities for technology jobs. The Washington-Arlington-Alexandria Metropolitan Statistical Area, which covers Washington, D.C., Northern Virginia, suburban Maryland, and part of the Eastern Panhandle of West Virginia, ranked second, and the Baltimore-Towson area placed fifth, according to the report published in May. The San Jose, Cal., metro area, which includes Silicon Valley, finished seventh.

Forbes judged metros by growth in science, technology, engineering, and mathematics occupations (STEM), as well as technology industry growth and occupation concentration. Both the Washington and Baltimore areas logged an average of 4 percent tech sector growth over the past two years, while Silicon Valley ended 2011 with 170,000 fewer tech employees than in 2000. The report credited the "broadness of the tech economy in the greater D.C. area" as a key to its growth.

"The Washington tech complex boasts substantial employment in such fields as computer systems design, custom programming and private-sector research and development," *Forbes* noted.

The region has also drawn strength from public research and development institutions, such as those in life sciences and national defense. The Baltimore area is home to labs such as the National Cancer Institute in Bethesda, Md., as well as premier life sciences research schools like The Johns Hopkins University. The Department of Defense's IT and communications support unit, the Defense Information Systems Agency, moved from Virginia to Fort Meade, about 15 miles south of Baltimore, last year, bringing demand for more cyber security employees.

"A lot of the core competencies of the region definitely come from federal influence, but I think that this new rejuvenation is being driven more by the private sector than the public sector," says Robert Rosenbaum, president and executive director of the Maryland Technology Development Corporation (TEDCO), a nonprofit that receives state funds to support growth and entrepreneurship in Maryland's tech industries. One of its upcoming initiatives seeks to invest $5.8 million of public and private dollars to develop commercially viable technologies.

D.C. is also seeking to grow its commercial tech sector. The District offered $32.5 million in tax incentives over a five-year period starting in 2015 to homegrown social media start-up LivingSocial in exchange for the company's promise to remain in the city and hire local workers. The company employs about 1,000 people in the area. Leaders in the District hope its tech sector will flourish as skilled workers cluster and attract other tech companies.

That pool of talent may already be in place. According to the May 2011 Occupational Employment Statistics from the U.S. Bureau of Labor Statistics, the District had the highest concentration of computer hardware engineers in the nation.

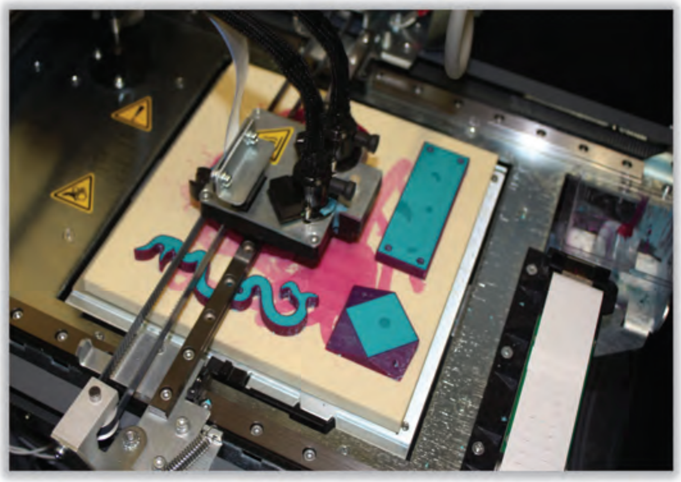
New technology also allows for the expansion of existing industries in new directions, as is the case with additive manufacturing in Baltimore. The process, often called "3D printing," involves creating three-dimensional objects from cartridges of raw materials. It has helped reduce production time in prototyping, for example, but it also opens the door for individuals interested in designing and producing unique crafts.

Michael Galiazzo, president of the Baltimore-based Regional Manufacturing Institute, says that a recent conference on additive manufacturing his group hosted attracted a large number of people from outside of traditional manufacturing.

"The new wave of manufacturing is going to be much more connected with the technology transfer to the commercial sector," he says. Policymakers and residents alike hope that growth in technology will mean growth in all areas of the economy.

"When people think of high-tech startups, they think of scientists working in labs and engineers writing computer code, but those employees don't run the companies by themselves," Rosenbaum says. "As these companies grow, they will create jobs for all sectors and all types of employees."

— Tim Sablik



The Object Lab at Towson University in Maryland allows students to gain hands-on experience with 3D printers. They learn to create objects for industries that range from aerospace and defense to art and design.

PHOTOGRAPHY: OBJECT LAB, TOWSON UNIVERSITY

Tax Time

Economics of Maryland Income Tax Hike Remains Unclear

Maryland's roughly 300,000 six-figure earners will bear more of the state's income tax burden starting this year. In May, the Maryland General Assembly raised income tax rates, retroactive to January 1, for individuals making more than $100,000 and joint filers making more than $150,000 per year. That comprises roughly 14 percent of the state's taxpayers. Depending on the income level, rates will increase by 0.25 percentage point to 0.75 percentage point. For a family of four making $250,000, for example, the new law could translate into an additional $989 in annual taxes.

Affected taxpayers will feel the burden even more sharply since tax withholding for the remainder of this year must make up the increase that accrued during the first half. Although retroactive tax increases are not unheard of — Connecticut enacted a similar one just last year — taxpayers can only budget their incomes according to the tax rates they know ahead of time.

According to the legislators, the $250 million in revenue resulting from the income tax hike will prevent, or at least delay, major cuts in state spending, a scenario some had dubbed the "doomsday budget." Gov. Martin O'Malley argued for the importance of state education spending and efforts to curb rising public university tuition as imperatives for the tax increase.

Other states have tried increasing tax rates on higher income earners. New York, in December 2011, raised income taxes on its millionaires, though it cut taxes for residents earning between $40,000 and $300,000. Meanwhile, 64 percent of Californians recently surveyed support a proposed referendum for November 2012 to increase the tax rate on California residents who earn more than $250,000 in annual income.

The higher taxes could bring unintended economic consequences. One is more volatile state revenue. Tracy Gordon, a tax expert at the Brookings Institution, points out, "high income individuals themselves tend to have more volatile income streams," since they often rely on income from capital gains and stock options. If states rely on wealthier residents for more and more of state revenue, that "does put the state on a little bit of a roller coaster in terms of revenues going up by quite a lot when times are good economically, and then also going down quite a lot when times are bad." (See "Toil and Trouble for Revenue Forecasters," *Region Focus*, Third Quarter 2011.)

Critics also argue that higher tax rates could drive six-figure earners out of the state. But theoretical possibility can differ from reality. Many economists have conducted empirical research on taxes' effect on interstate migration, and have generally found a small yet statistically significant correlation between increases in a state's income taxes and more migration from that state. A 2011 study focusing on the proposed "millionaires' tax" in New Jersey found that tax-induced migration would not come "anywhere close to eclipsing the immediate revenue gain from an income tax increase," according to economists Roger Cohen, Andrew Lai, and Charles Steindel of the New Jersey Department of the Treasury. Nevertheless, the authors concede, "over time, migration could offset a meaningful share of revenue boost."

Maryland might face the possibility of reduced in-migration, as well. People moving to the Washington, D.C., metro area might decide to live in Virginia instead of Maryland because of the latter's tax increase. A 2010 study found that "differences in state income tax rates have a statistically significant impact on the probability a household locates in the low tax state within an MSA," according to economists William Hoyt of University of Kentucky, Paul Coomes of University of Louisville, and Kenneth Sanford of Middle State Tennessee University.

Nevertheless, "taxes are just one part of the picture," says Gordon. Taxes alone neither cause people to move out nor prevent people from moving in; factors like education and safety remain relevant. "If people were weighing the decision to migrate to another state, like Virginia, they would have to weigh all the factors that contribute to their quality of life." — Seth Rubinstein

Market Benefit
Access to Fresh Food

Many farmers markets now accept electronic payments. Markets in Spotsylvania County, Va., even offer a bonus match for those using their food assistance benefit cards.

PHOTOGRAPHY: VIRGINIA DEPT. OF AGRICULTURE AND CONSUMER SERVICES

Electronic payment options are putting more locally grown fruits and vegetables on peoples' plates and more money in vendors' pockets as farmers markets increasingly accept electronic benefits transfer (EBT) cards. The cards are issued by state governments to those who qualify for the Supplemental Nutrition Assistance Program (SNAP), formerly known as food stamps. The technology also allows markets to swipe credit and debit cards.

Tom Elmore likes selling his home-grown produce to those who may need it most. He has farmed organically in Leicester, N.C., for 25 years, and sells at the West Asheville Tailgate Market, which began accepting EBT, credit, and debit cards last spring.

"Small farmers, as a general rule, are not particularly affluent, so we can relate to low-income people," he says. "It's a great thing to sell to a wide range of clientele, particularly folks who are interested enough in good food to shop at our market."

The average monthly SNAP benefit per person in North Carolina is $124.58.

Less than a quarter of the nation's roughly 7,100 farmers markets — about 1,548 — are set up to accept the EBT cards, so the U.S. Department of Agriculture (USDA) last May announced grants to expand the program. North Carolina, with about 200 markets, will receive $109,631 to pay for wireless card readers and monthly access fees; Virginia has roughly the same number of markets and will get about $92,000.

A market typically operates one device at a central location, where customers buy tokens that they then exchange for products. EBT customers buy tokens in $1 increments; credit and debit card customers buy $5 tokens. (The reason for the difference is that SNAP participants can't receive change from vendors.)

Some markets charge customers for credit or debit sales to cover various transaction fees. But the West Asheville market instead assesses vendors $2 per week in addition to the regular weekly fee, an option the vendor committee chose to encourage card use.

Mike McCreary manages the Asheville City Market. His card-related costs will total roughly $5,000 this year, he says, including bank fees and staff time for record-keeping. In 2011, the market in downtown Asheville grossed roughly $700,000, and about 10 percent of that was token sales. Of that 10 percent, EBT sales represented a third, and the rest were credit or debit sales.

"We are seeing [EBT] sales grow each year," McCreary says. "It's an investment in the future."

A North Carolina nonprofit, The Leaflight Inc., helps markets equip, train, and promote EBT use. The cards, says executive director Robert Smith, help penetrate "food deserts," locales lacking fruits and vegetables. "You may live close to convenience stores with cupcakes, potato chips, and beef jerky, but you might have to travel eight to 10 miles to get to a supermarket," Smith explains.

With funds from another nonprofit, the national Wholesome Wave Foundation, the Spotsylvania Farmers Market in Fredericksburg, Va., offers $10 in tokens as a bonus for SNAP customers who buy $10 in tokens or more, according to manager Elizabeth Borst. "We want to bring everybody in our community into the farmers market concept." Token sales in 2009, for only four

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FEDERAL RESERVE

Winners and Losers from Monetary Policy

BY RENEE HALTOM

The Fed seeks to support the economy as a whole, but some redistributional effects are unavoidable

"I feel like a lazy bum," lamented economics blogger Scott Sumner in a recent post. "This morning Ben Bernanke created $250,000,000,000 in new wealth before I'd even finished breakfast." The Bentley University professor argued that the Fed chairman's speech that morning had led to about a half percent increase in stock prices worldwide based on the hopes it created for further monetary easing. With it came a windfall for equity investors.

When the Fed injects money into the economy, the effects are not spread evenly. The first point of impact is the banking system, where the Fed trades newly created money for assets. The infusion of cash causes financial institutions to bid down lending rates, which pushes down other lending rates in the economy and, the Fed hopes, stimulates the economy as a whole. Interest-sensitive sectors, like manufacturing and real estate, tend to respond first, with the rest of the economy in tow. Some sectors, regions, and demographic groups might experience a bigger boost than others from Fed easing, or higher costs when the Fed tightens.

The Fed's most important effects on the economy — in carrying out its congressional mandate of price stability and maximum sustainable employment — might also affect households differently depending on whether they hold inflation-protected assets, have big debts that might be eroded by inflation, or have labor market skills that insulate them from a down business cycle.

None of these distributional effects are the *intent* of monetary policy. The Fed mandate means it must focus on broad indicators of economic performance. Any redistribution of wealth that occurs is an incidental but often unavoidable byproduct. If Fed policy is stable and predictable, its inadvertent redistributional effects will likely be kept at a minimum.

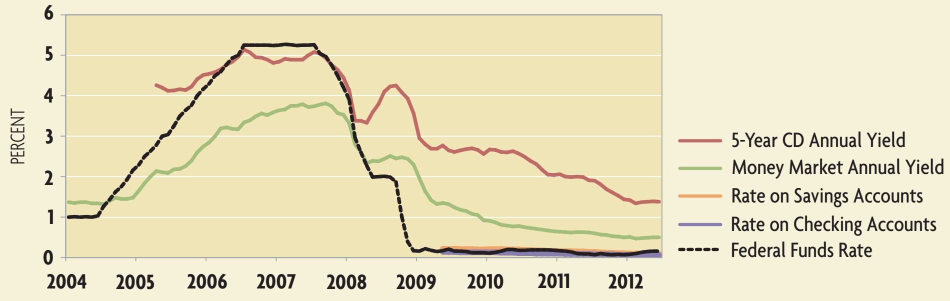
Low Rates Hurt Savers

Today's record-low rates may have helped boost financial markets, but one group of investors is not happy: savers holding liquid, cash-like instruments such as bank deposits, certificates of deposit (CDs), and money market deposit accounts. The return on these investments is a market interest rate, driven historically low by the near-zero interest rate policy that has prevailed since late 2008. Traditional bank deposits currently pay a hair above zero; money market accounts pay less than half a percent. A five-year CD pays less than 1.5 percent, compared to 5 percent before the financial crisis (see chart below). Household interest income has fallen by more than $400 billion since the Fed sharply cut rates during the financial crisis, a decline of about a third (see chart on next page).

That puts a squeeze on households that rely on interest income, such as seniors. They tend to have shifted into the type of safe, liquid assets that produce negligible returns in a low-interest rate environment. But seniors are affected differently based on where they stand in the wealth distribution. Lower-income retirees, like the poor of every age group, hold very little financial wealth to begin with. People over 60 in the bottom 40 percent of the wealth distribution tended to hold no more than $3,000 in financial assets, yielding less than 1 percent of their total income, according to research by Anthony Webb and Richard Kopcke at Boston College's Center for Retirement Research. They studied data from the University of Michigan's 2008 Health and Retirement Study (HRS), which surveys retirement-age households about all sources of income.

The richer portion of the over-60 age group — those ranking in the top 20 percent in wealth — get about half of their income from financial investments. But Webb says even they are spared from low rates because they tend to invest more heavily in stocks — at nearly three-quarters of their financial investments — than cash-like investments. "Stock prices fell a lot, but then came back, and dividends

Many Asset Returns Move with Fed Policy



SOURCES: Federal Deposit Insurance Corporation, Federal Reserve, *Wall Street Journal*, Haver Analytics. Monthly data, last observation July 2012.

have held up. So if you're a rich rentier living off your dividend income, your income really hasn't been affected" by low rates, he says. In fact, Fed policy has probably helped boost stocks and dividends.

By Webb's calculations, the people over 60 who have really been burned by low rates are the middle to upper-middle classes, households in the 3rd and 4th quintiles of wealth that hold between roughly $30,000 and $160,000 in financial assets, yielding between 5 percent and 20 percent of their total income. They hold enough financial wealth for it to matter to their total bottom line, and have tended to invest very conservatively in cash and short-term investments for which the yield has basically gone to zero, Webb says. Still, losses on investments amount to less than 10 percent of their total income in most cases, according to the HRS. Instead, this group relies heavily on other sources of wealth in retirement such as Social Security, real estate, and pensions. On the other hand, the wealthiest 20 percent of people over 60 — for whom financial investments make up half of total income — lost up to one-fifth of their total income from investment losses during the recession through 2011.

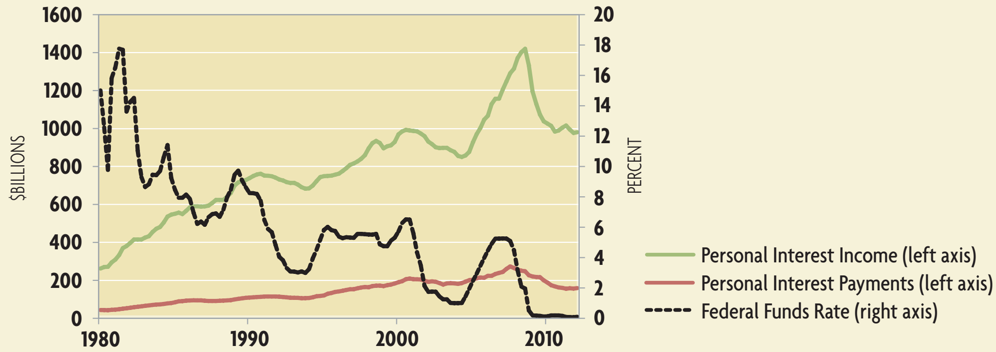
As for the population including all ages, most households simply don't hold much of their overall wealth in assets that move directly with the fed funds rate. Checking, savings, CDs, money market deposit accounts, and call or cash accounts at brokerages consistently amount to around 5 percent of total household assets across the wealth spectrum, according to the Fed's Survey of Consumer Finances (SCF).

The SCF surveys 4,500 households, a nationally representative sample, every three years about their asset holdings and reports the data by age, income, wealth, and other characteristics. By that measure, families get a quarter of their net worth from other financial assets — stocks, retirement accounts, and other managed assets — and half from the nonfinancial assets of houses and equity in businesses. The returns on these assets are tied more to prospects for the overall economy than to Fed policy, though the latter influences the former. But that means their values have risen as interest income has fallen over the last several years.

Moreover, when interest rates fall, households are on the winning end of other transactions. As aggregate household income has fallen, their interest payments fell by an even greater percentage (see chart above). Some of that aggregate decline could be due to households having reduced their overall debt burdens in the aftermath of the recession, but it's also the case that low interest rates suppress household expenses for some of the largest purchases they make: durables that require financing, like appliances, cars, and houses. Rates on credit cards, car loans, personal loans, and mortgages have all fallen to historic lows in the last few years.

Households' portfolio choices mean two things for Fed policy: First, a good portion of the population is "far more interested in the Fed's ability to boost employment than in the Fed's ability to boost asset returns," as Webb puts it. And second, if low rates strengthen the economy as a whole, the Fed is "helping to improve the returns to savers," as Chairman Bernanke recently told Congress in defense of the effect of low rates on savers.

Interest Income Has Fallen with Fed Policy — But So Have Interest Payments



SOURCES: Bureau of Economic Analysis, Federal Reserve, Haver Analytics. Quarterly data, last observation 1Q 2012.

Inflation: The Cruelest Tax?

People tend to focus on the effect of nominal interest rates on asset returns, but it's real interest rates — rates adjusted for inflation — that matter. "Back in the 1980s, we had these wonderful high interest rates. But we also had less wonderful high inflation" that ate into returns, Webb points out.

In fact, inflation is where the Fed's effect on the economy is greatest over time. When the Fed does a one-time easing of policy, there's typically a boost to economic growth and inflation in the short run. Eventually, however, the effect on economic growth dies out, but the effect on the price level remains — that is, there has been a permanent increase in the price level and a one-time increase in inflation. Every other way in which the Fed affects the economy — through asset prices, market interest rates, and especially the business cycle — is for the most part temporary. After these effects of Fed policy work through the economy, changes to the money supply, and therefore the price level, are all that's left.

Many people assume that general inflation hurts lower income households most, and more than one politician in history has repeated the charge that it is the "cruelest tax." The rich would seem better equipped than the poor to protect themselves from inflation through access to inflation-protected financial instruments and financial advice. But the idea that inflation hurts the poor more than others "is a long-standing myth that must go back 50 years, maybe longer," says Alan Blinder of Princeton University who served as vice chairman of the Fed in the 1990s. For one thing, "the poor basically have no assets whose values can fall in real terms because of inflation," he says.

Monetary policy can have unintended — though often unavoidable — redistributional effects. If Fed policy is stable and predictable, those effects will likely be kept at a minimum.

It is true that rising food and energy prices disproportionately hurt the poor because they spend a larger proportion of their income on those necessities. But that is a different phenomenon than general inflation brought about by expansionary Fed policy. Commodity prices are affected primarily by global supply and demand conditions in those markets, and only indirectly by Fed policy, if at all.

There is one respect in which inflation does target the poor: They hold more cash as a fraction of consumption, leaving them vulnerable to an eroding currency. Wealthier households, on the other hand, tend to consume using other means like credit cards. In the United States, the middle and upper classes can get a free short-term loan by charging a purchase and then paying it off at the end of the billing cycle; the poor cannot. "If you have a credit card, you put up the cash later when the inflation rate is higher," says Gustavo Ventura at Arizona State University. "In real terms you are spending a tiny bit less by using a credit card." The 17 million adults who lack bank accounts in the United States are mostly minority and poor, according to the Federal Deposit Insurance Corporation. Even the poor who have bank accounts are less likely to use credit cards because it's a costly service. Since they are more restricted to cash, inflation acts like a tax on their consumption, Ventura and Andres Erosa at the University of Toronto found in a 2002 study.

But Ventura cautions that the effect is probably small. Today's poor have better access to credit cards and other means of payment than they had even a decade ago when the research was conducted. More important, inflation has been low and stable over the last 30 years, with prices having risen just 3 percent each year on average. "That's just not a big deal" in terms of the inflation tax on cash holdings, he says, especially considering that nominal wages have grown by multiples faster than prices.

Therefore, the redistributional impact of the relatively low and stable rates of inflation we tend to see today is likely to be small. The picture changes when inflation comes as a surprise. To the extent that existing lending agreements don't take account of unexpected inflation, it causes a potentially substantial transfer of wealth from lenders to borrowers, which research shows is more likely to hurt the rich, not the poor. Matthias Doepke and Martin Schneider, now at Northwestern and Stanford universities, respectively, analyzed the likely winners and losers from this effect in a 2006 study. Among broad sectors of the economy — households, governments, and foreigners — they calculated how exposed each group was to surprise inflation over the last 60 years based on their holdings of nominal assets whose values are subject to decay when inflation hits.

Given the portfolios those groups tend to hold today, the research of Doepke and Schneider suggests the household sector would gain slightly from surprise inflation due to its overall indebtedness, but with dramatically different results across ages and incomes. Once again, older people are more vulnerable due to the typical assets one holds toward retirement. Surprise inflation tends to transfer wealth from older, richer households — that are likely to have loaded up on savings and pared down debt — to the young. The wealthiest older people are most exposed to inflation since they hold relatively more long-term bonds, mostly through pension plans and mutual funds. Older people among the poor and middle class are also on the losing end of inflation, but less so because their dominant holdings are in shorter-term instruments such as bank deposits. The young, especially the middle class, stand to gain from higher inflation due to their substantial mortgage debt. But young, poor households also gain through what they owe in consumer credit.

These trends have changed over time. The household sector as a whole was the U.S. economy's major class of lenders before the 1980s, but that changed with the explosion of mortgage debt, which peaked in the late 2000s, and the substantial expansion of unsecured consumer credit. Foreigners have taken their place as capital has flown into the United States in recent years. "If the United States were to inflate now, then much of the cost would be borne by people in other countries," Doepke says. Today, an inflation surprise would be a boon for the government sector — the U.S. economy's major net borrower — and a tax on foreigners.

Taxing foreigners, in effect, through inflation to benefit domestic governments and middle-class households might sound like an opportunity for Fed policy. The fact that the latter groups are indebted following the financial crisis and recession has led some economists to argue that a bit of inflation would speed the economy's recovery by relieving those burdens. Even they tend to agree, however, that it's not a viable long-run strategy. "The basis for these gains would go away if you started to exploit them systematically," Doepke says. Lenders, both foreign and domestic, would adjust their expectations to a policy of opportunistic inflation, and would demand inflation protection from assets.

What that means is that the government's borrowing rates, for example, could be driven much higher. The effects of such an increase would be far-reaching; the average maturity of outstanding federal debt is only about five years, so that debt would soon have to be reissued at the higher rates. After accounting for the likelihood that future borrowing would be more expensive, inflation erodes government debt quite slowly, according to a 2011 study by Michael Krause and Stéphane Moyen at Germany's central bank.

Doepke and Schneider argued that the scope for redistribution is greater in recent years since both the assets and liabilities of households have grown larger. But there is one clear way for the Fed to avoid this redistribution altogether: "Focusing on low inflation basically minimizes redistribution that results from inflation," says Ventura. Contractionary policy to lower inflation might produce a windfall for long-term bondholders, for example, but a consistent, stable inflation rate allows financial market participants to incorporate the majority of price increases into contracts. That minimizes the more serious redistribution that results from inflation surprises.

Bearing the Brunt of Disinflation

When inflation reaches unacceptable levels, the Fed typically pursues contractionary policies — and with contraction can come a slowing of real economic activity and employment. The burden of disinflationary episodes tends to be borne disproportionately by the poor, minority, and young, who tend to be relatively less productive workers with fewer skills, and therefore are laid off first. This effect was visible during the Volcker disinflation, which lasted from October 1979 to the end of 1982. Willem Thorbecke at Japan's Research Institute for Economy, Trade, and Industry found in 1997 that the episode caused black unemployment to increase by 9.5 percent and Hispanic unemployment by 7.1 percent, while white unemployment increased only by 4.5 percent.

The basic numbers showing these employment flows are supported by decades of research. Blinder has co-authored several studies over the last 35 years arguing that, of the economic ills the Fed is charged with combating, unemployment is more likely to harm the poor than inflation. For example, he and Rebecca Blank, now acting secretary of commerce, found in 1985 that both poverty and income shares for the bottom 20th percentile of income move closely with the business cycle. "[H]igh unemployment is strongly and systematically regressive whereas high inflation has weak, if any, effects on the distribution of income," they wrote. The upside is that the effect works in reverse when the economy does well: A rising tide lifts the smallest boats most, an effect to keep in mind when the unemployed are "drafted to fight the war on inflation," they argued.

Central bankers are quick to caution that the effects of monetary policy on employment are inherently temporary — so while the effect on certain groups is important, it must be weighed against the substantial long-run benefits of price stability. But unemployment itself can have lasting effects. Rutgers University economist William Rodgers found in a 2008 study that spikes in the fed funds rate increase the length of unemployment spells at all durations, especially for blacks. Longer unemployment spells can negatively affect lifetime earnings, job tenure and experience, and reemployment prospects, he argued. To the extent that this occurs for any group, it adds to the costs of contractionary policy.

While these negative effects appear to fall more heavily on certain groups, Thorbecke argues that doesn't necessarily mean those effects should change Fed policy. "It is good to learn as much as we can about how monetary policy works. How does it affect asset prices? How does it affect small and large firms? How does it affect different groups in society?" But in terms of making policy, "the Federal Reserve faces constraints. Congress has given it specific targets, and the Fed needs to focus on these."

Instead, the distributional costs of monetary policy might imply a role for compensating disadvantaged groups through the more targeted tool of fiscal policy. Knowing the likely winners and losers from monetary policy could help to inform those types of policy decisions. For example, in their work showing that surprise inflation benefits the young and governments at the expense of the old and foreigners, Doepke and Schneider pointed out that if the federal government benefited from inflation, Congress would have a choice in how to allocate the gains. For example, it could reduce income taxes, which would benefit younger households further, or it could compensate the losers from the inflation, like older households, through greater safety net transfers. The average retiree gets about 30 percent of wealth from Social Security, which is indexed to inflation; thus, in one way, the government already compensates households that tend to be on the losing end of rising prices. (It's an imperfect mechanism in that reliance on Social Security falls as wealth — and the adverse effects of inflation — increases. The poorest 25 percent of retirees hold as much as 80 percent of their wealth in Social Security.)

Policy Choices with Blunt Tools

The largest redistributional effects from Fed policy appear to come in times of change: when inflation spikes suddenly; when it has to be brought down painfully; or when policy shifts unexpectedly, causing markets to reinterpret Fed objectives and reassess the economy's prospects. The Fed can best avoid those redistributive effects by keeping policy predictable and stable.

That doesn't mean there won't sometimes be uncomfortable circumstances in the short run, such as high unemployment existing in one demographic group while overall unemployment is at an acceptable level. The Fed often finds itself in an analogous position on the other side of its dual mandate: one in which average inflation is on target, but the prices of certain goods — goods that make up a larger proportion of poorer households' budgets, no less — are rising quickly. That's the case when prices for food and energy spike even though "core" inflation, which omits those prices, is on track. But outside of emergencies like the recent financial crisis, the Fed has essentially one blunt policy tool — interest rates — that has no direct influence over the price of one good relative to another, nor on unemployment rates for specific groups. That's why the Fed's mandate focuses on the broad economic indicators of *average* prices and *overall* employment and growth. By attempting to bring down unemployment for one group, the Fed could very well overstimulate the economy, raising inflation and throwing off its actual policy objectives.

In the long run, inflation is bad for almost everybody.

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JargonAlert

Balance of Trade

BY JESSIE ROMERO

According to the Commerce Department, U.S. exports reached $185 billion in June alone, near an all-time high set in March. Yet the country's overall balance of trade was a negative $43 billion, as U.S. imports reached $228 billion.

The balance of trade is the difference between a country's exports and imports. Exports are domestically produced goods and services sold abroad; imports are the purchase of foreign goods and services. Between 1960 and 1975, the United States ran a trade surplus. Since then, however, the country has run large annual trade deficits, peaking at $753 billion — 5.6 percent of GDP — in 2006. Falling imports brought the deficit to a nine-year low of $381 billion during the 2007-09 recession, but the gap widened to $560 billion in 2011. Rising oil prices added about $100 billion to the 2011 deficit.

How can a country buy more goods than it sells? It borrows from the rest of the world. In the United States, the balance of trade makes up the majority of the current account, which is part of the country's international balance of payments. The current account is the difference between income and expenditures, which, in addition to net exports, includes interest earned on foreign investments, debt payments to foreign investors, and net unilateral transfers, such as foreign aid. When the income from selling U.S. goods is insufficient to purchase foreign goods, households, firms, and governments borrow on international capital markets. The current account deficit thus reflects net foreign borrowing, and is closely linked to the imbalance in U.S. trade.

The current account balance corresponds to the difference between domestic saving and investment. Because the U.S. saving rate is well below the investment rate, the country relies on foreign capital to finance its investment. That occurs when the rest of the world sends goods to the United States in exchange for what is in effect a financial promise that the United States will send back more goods in the future. Cash is one kind of promise, but since dollars don't pay interest, other countries use those dollars to purchase assets such as U.S. government bonds, stocks, or real estate. A trade deficit is thus associated with a net flow of financial assets in the opposite direction, and is equivalent to having foreigners finance domestic investment.

The balance of trade is affected by both international and domestic events. One possible explanation for the run-up in the U.S. deficit during the 2000s is the "global saving glut," a phrase coined by then-Fed governor Ben Bernanke in 2005. In response to a series of financial crises in the 1990s, many developing countries became net exporters rather than net importers of financial capital. Rising productivity and a history of financial and political stability made the United States an attractive home for these investments, leading to higher equity prices and a stronger dollar. Stock market wealth made U.S. consumers more willing to buy goods and services, and the strong dollar made U.S. imports relatively cheap and exports relatively expensive — contributing to a larger trade imbalance.

Some observers attribute the trade deficit to the large decline in manufacturing employment over the past several decades and to the slow job growth coming out of the recession. But running a trade deficit isn't necessarily a bad thing. Intertemporal trade — that is, importing today and exporting tomorrow — allows a country to smooth its consumption through economic ups and downs. From the perspective of the current account, if a country has a lot of productive investments to make or expects to grow very rapidly in the future, it makes sense to run a current account deficit in the present and pay it back with future surpluses. Moreover, trade deficits often are a result of worldwide production being shifted to its most productive locations.

Although the recession temporarily slowed the growth of the trade and current account deficits, concerns remain about when and how the trade imbalance will be resolved. Some economists fear the United States' foreign debt is approaching the level where foreign investors would lend money only at much worse terms than at present. Others believe that would be unlikely due to the size, diversity, and resilience of the U.S. economy. Given that yields on U.S. government bonds have actually fallen throughout the financial turmoil of the past several years, it seems unlikely that foreign investors are close to losing faith in the U.S. economy. If the trade deficit rises toward prerecession levels, however, policymakers will be watching closely — but what they should do in response is not so clear. Attempting to narrow the trade gap through import restrictions, for instance, would likely hurt domestic consumers, provoke a backlash abroad, and lower global economic productivity. Such a "cure" could be worse than the perceived problem. **RF**

ILLUSTRATION: TIMOTHY COOK

Are New Graduates Left Behind in a Recession?

BY TIM SABLIK

The process of leaving school and searching for that first job can be intimidating for any college graduate. Graduating into an economy with high unemployment poses even greater challenges. Economic studies have documented that availability of jobs and opportunities for growth at firms decline during recessions. Do students who graduate during a recession suffer a long-term disadvantage in the labor market compared to students who graduate in healthier economic times? And if so, how long does it take them to recover?

Researchers Philip Oreopoulos of the University of Toronto, Till von Wachter of Columbia University, and Andrew Heisz of Statistics Canada set out to answer that question. They look at 20 years of employer-employee matched data on male college students in Canada to determine if graduating in a recession has an effect on wages earned over 10 years.

They find that if the unemployment rate increases 5 percentage points (the benchmark the authors use to denote a shift from a healthy economy to recession), annual wages are 9 percent lower for graduates entering the workforce compared to students graduating into a healthy economy. After five years, that average wage gap is 4 percent, and after 10 years, the effect largely fades out.

Not all students appear to face the same penalty, however. The authors use a statistical model to predict earnings in nonrecessionary times based on college attended and program of study. The estimate of earnings captures college quality and student ability, since each student chooses which college to attend and what to study. Highly skilled students are more likely to attend high-quality colleges and choose more challenging and marketable majors, partly accounting for the higher predicted wages.

Whether the predicted wages are more a function of college quality, employer demand for a given major, or innate student ability is unclear. What is clear from the authors' analysis is that students with lower predicted wages upon graduating incur much greater setbacks when entering the labor market during a recession than students with higher predicted wages. The authors find that students with the lowest predicted wages suffer 15 percent lower wages in the first year due to a 5 percentage point increase in unemployment. This effect is also highly persistent: Even after 10 years, these students earn 7.5 percent less than similar students who graduated into a better economy.

In contrast, students with the highest predicted wages earn 7.5 percent lower annual wages in the first year after a 5 percentage point increase in unemployment. But the gap between their earnings and what they should expect to make in stronger economic times drops to less than 2 percent after four years.

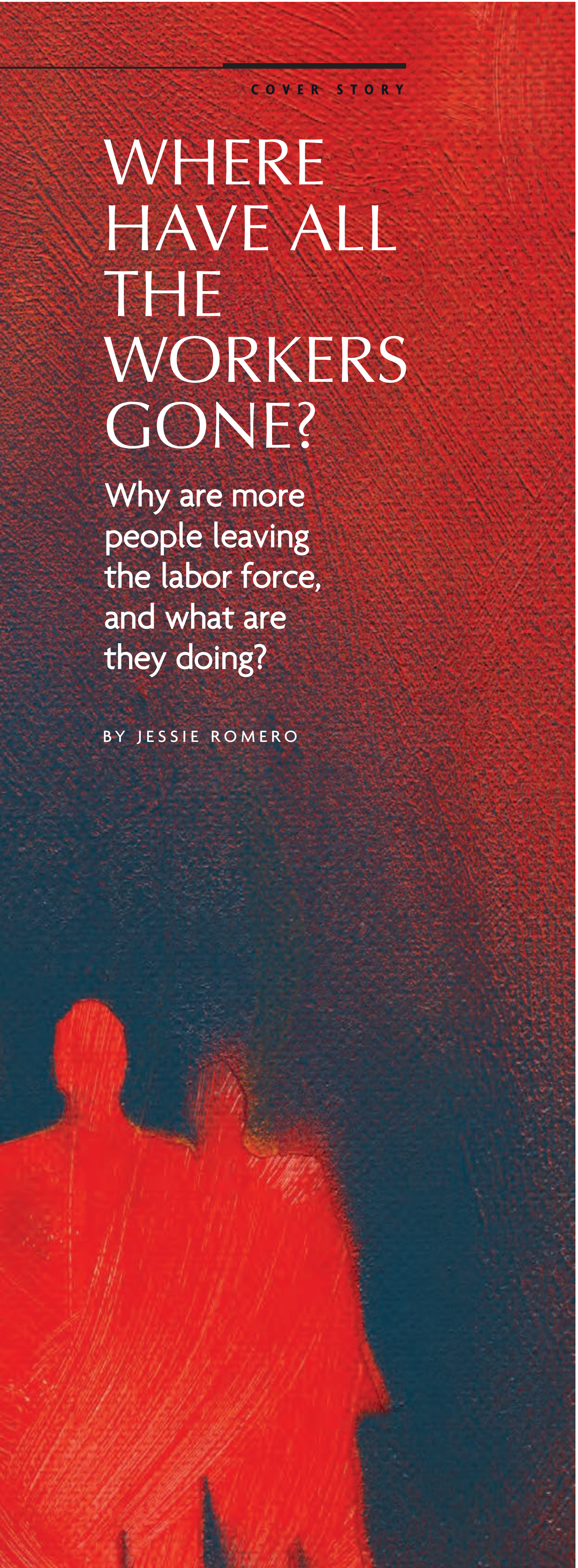
Young workers improve their wage and job position by switching employers more frequently in the first three to five years of their career. Compared to their peers graduating in healthy economic times, new graduates entering the labor market during a recession are more likely to get a job with a lower-quality employer in terms of total payroll and median wage. The authors find that roughly half of the recovery from this initial wage setback can be explained by job mobility.

"The Short- and Long-Term Career Effects of Graduating in a Recession." Philip Oreopoulos, Till von Wachter, and Andrew Heisz. *American Economic Journal: Applied Economics*, January 2012, vol. 4, no. 1, pp. 1-29.

Graduates with higher expected wages exhibit large increases in job mobility in the first years after graduating, and this allows them to move to higher-quality firms and close the wage gap in about four years. Students with lower expected wages, however, exhibit only a slight increase in job mobility in the first few years after leaving school. This means that they are not able to close the wage gap by switching to better-paying firms.

In fact, on average, these graduates are never able to fully recover from the initial impact of graduating during a period of high unemployment. The authors use a model that incorporates search frictions that grow larger as workers age. As workers get older, more factors tie them to a particular location, such as a house or spouse and family, making them less able to move between jobs. Consequently, graduates with the lowest expected wages, on average, don't recover from the initial shock of a recession before these search frictions permanently keep them at lower-paying firms.

Oreopoulos, von Wachter, and Heisz stress that these search frictions are critical for explaining the long-term impact of a recession on new workers' wages. If search frictions did not increase as workers aged, then workers with the lowest predicted wages would eventually be able to overcome the penalty to their wages, given enough time. Graduating during a recession hurts the wages of all students getting their first job, but for some it can depress wages over their entire lifetime. **RF**



WHERE HAVE ALL THE WORKERS GONE?

Why are more people leaving the labor force, and what are they doing?

BY JESSIE ROMERO

Since September of last year, the unemployment rate in the United States has declined nearly a full percentage point, from 9 percent to 8.3 percent. On its face, this is an encouraging signal about the health of the labor market. But some of the change is due to a potentially troubling trend: a dramatic decline in the number of Americans who are part of the labor force. Prior to the recession, 66 percent of the population (not counting active duty military or people in a nursing home or in prison) over the age of 16 was in the labor force. Just four years later, this rate — known as the "labor force participation rate," or LFPR — has fallen to 63.7 percent. While this might not sound like a large decline, it is unprecedented in the postwar era.

The dropoff is all the more striking because it does not include unemployed workers who are actively seeking work; such workers are still considered to be part of the labor force. It is only when the unemployed decide to stop looking for jobs, perhaps because they have given up on the possibility of finding one, that they are considered out of the labor force — although they might still want to work, and would accept jobs if they were offered.

The current low labor force participation rate is the result of both long-term structural changes, such as an aging population and decreased demand for low-skill workers, and cyclical factors, namely the lingering effects of the 2007-09 recession. While it's difficult to distinguish between the effects of demographics and the effects of the business cycle on labor force participation, why people drop out of the labor force — and what they do when they're not working — has important implications for the future growth of the U.S. economy.

Trend Versus Cycle

Beginning in the early 1960s, the LFPR began a four-decades-long increase, from less than 60 percent to a high of 67.3 percent at the beginning of 2000 (see chart). The rise was driven by greater participation of women and by the entry of the baby-boom generation into the workforce, which skewed the population toward age cohorts that have very high participation rates. These demographic changes were large enough to counteract the effects of occasional weak labor markets, and during most postwar recessions, labor force participation held steady or even increased. That changed a decade ago — the LFPR began to fall at the beginning of the 2001 recession and never recovered. Compared to the present, however, the drop then was small: In the four years following the start of the 2001 recession, the LFPR declined 1.1 percentage points, compared to 2.4 percentage points over the same corresponding period since the start of the 2007-09 recession.

Since the beginning of the 2007-09 recession, Fifth District states have fared both better and worse than the nation as a whole in terms of labor force participation. In Virginia, labor force participation has been fairly constant, remaining largely unchanged since the beginning of the recession. In Maryland, the rate declined by 2.0 percentage points, while West Virginia and Washington, D.C., saw declines comparable to the national decline of 2.4 percentage points. In North Carolina, the LFPR has fallen by 3.1 percentage points, and in South Carolina it has

PHOTOGRAPHY: AMY DEVOOGD/PHOTODISC/GETTY IMAGES declined by 3.6 percentage points, the largest decrease in the Fifth District and one of the largest in the nation.

Even before the recession, labor force participation had been trending downward. Teenagers and young adults are remaining in school longer and are less likely to work while they are in school. Women's participation, which fueled much of the growth in the LFPR after 1960, leveled off in the 1990s. And although the participation rate for older workers has been gradually increasing due to improved health and the reduction in defined-benefit retirement plans, the participation rate for the group as a whole is still much lower than for other demographic groups. The increasing share of older workers in the population thus brings down the overall LFPR. In January, for example, it appeared that more than 1 million workers left the labor force, and that the LFPR fell 0.3 percentage point. But the drop was due entirely to revised population estimates based on the 2010 census; there were simply more older people in the population than the BLS originally thought.

Men aged 25-54 traditionally have been the most attached to the labor force, but their participation has been falling for decades. Between 1970 and the beginning of the most recent recession, men's LFPR fell from 96 percent to 90.6 percent. At present, the rate is 88.5 percent. One possible explanation for this decline is relaxed requirements and increased benefits for disability insurance.

In 1984, Congress authorized changes that made it easier for workers suffering from ailments such as mental illness or muscle pain to qualify for disability insurance. Currently, beneficiaries receive an average of $1,150 per month in cash payments and full Medicare benefits. Because workers stop receiving benefits if they demonstrate that they are able to work, the program creates a strong incentive for workers to exit the labor force permanently. (See "The Sharp Rise in Disability Claims," page 24.)

Although demographic and policy changes have contributed to a long-term downward trend in labor force participation, the current decline appears to be too large to be explained solely by these factors. "I think the vast majority has got to be the recession. There's just not enough time for demographics to have changed that much," says Jesse Rothstein, an economist at the University of California, Berkeley and chief economist at the Department of Labor for 2010.

But it's difficult to discern the impact of the business cycle relative to structural change. "The certain answer I can give you is that they're both playing a role. If you want me to divide it proportionally and say how important is each, that's where it becomes much, much more difficult," says Betsey Stevenson, an economist at the University of Pennsylvania. Stevenson served as chief economist at the Department of Labor for 2011.

A recent report by Dean Maki, an economist at Barclays Capital, argued that only about one-third of the recent decline in the LFPR is due to the weak labor market, with the rest due to demographic factors. Economist Willem Van Zandweghe at the Kansas City Fed found that the split is closer to 50-50, as did economists at the Chicago Fed. Van Zandweghe used a model in which the overall unemployment rate is the primary cyclical indicator. When he altered the model to include the long-term unemployment rate, which might be a better gauge of labor market weakness, he found that cyclical factors could explain as much as 90 percent of the decline in the LFPR.

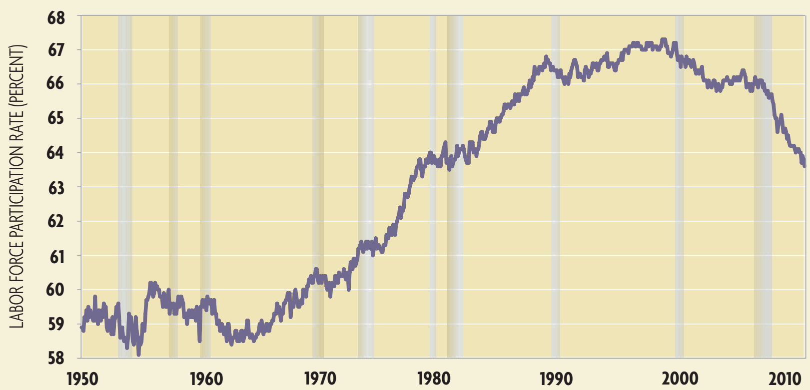
Ins and Outs

Whatever the research eventually shows, the fact remains that millions of people who would like to be working have given up trying to find a job. According to the monthly Current Population Survey (CPS) conducted by the BLS, the share of workers not in the labor force who report that they want a job now increased from 5.5 percent prior to the recession to 8.4 percent in mid-2011, and remains elevated at 7.9 percent today — a total of 6.8 million workers. "There's a large group of people who are counted as out of the labor force who we should be trying to find jobs for, and who would want jobs if they were available," says Rothstein.

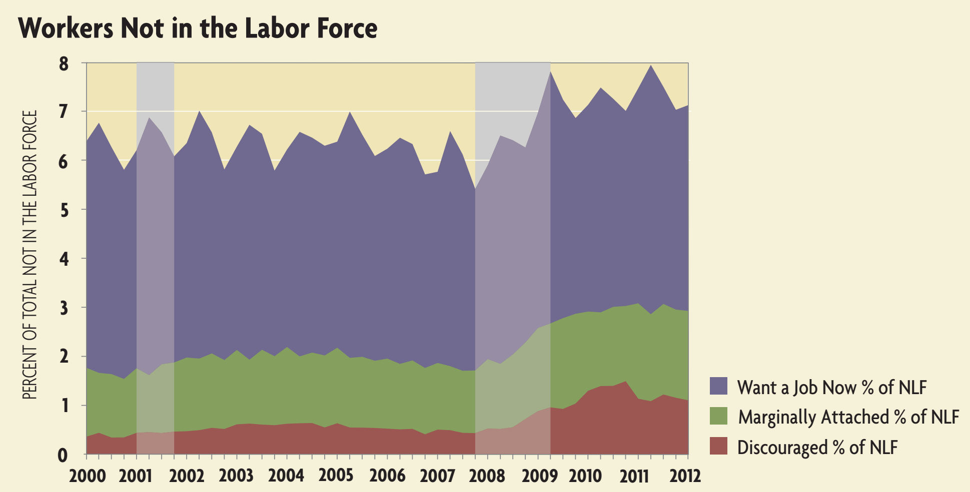
Of the workers who want a job, 2.5 million are considered "marginally attached" to the labor force; they have searched for a job within the past year, but not within the past four weeks, and are available to work now. (The remaining workers who want a job either have not searched within the past year or are not available to work.) More than 800,000 marginally attached workers are considered "discouraged workers" — they have stopped looking for work because they do not believe that any jobs are available for them. Other reasons for not looking for work include family responsibilities, attending school or a training program, ill health or disability, or "other," such as a lack of transportation or child care.

Between 1994 and the end of 2007, discouraged workers made up about 8 percent of workers who want a job, with a high of 11 percent following the 2001 recession. (The BLS made substantial changes to the CPS in 1994,

Labor Force Participation, 1950 to Present



NOTE: Shaded areas denote recessions.
SOURCES: Bureau of Labor Statistics, Haver Analytics



NOTE: Shaded areas denote recessions.
SOURCES: Bureau of Labor Statistics, Haver Analytics; *Region Focus* calculations

so comparisons to prior years' data are not possible.) From the beginning of the most recent recession until the end of 2010, the share increased from 8.25 percent to 22 percent. Since then, discouraged workers have remained about 15 percent of workers who want a job.

The official number probably understates the true amount of discouragement in the labor market. To be defined as a discouraged worker — a subset of the marginally attached — a worker must have searched for a job within the past year. More than 3.2 million workers say that they do want a job but that they stopped looking more than a year ago. These workers are not counted as discouraged by the CPS, but it's likely that some of them originally quit the labor force because they were pessimistic about job opportunities.

In addition, some of the 80 million workers who say they do not want a job now might have dropped out due to weak job prospects. For example, nearly 50 percent of all workers not in the labor force report that they are retired. They aren't classified as discouraged, but some of them likely decided to retire early rather than continuing to search for a job. (See "Recession on the Eve of Retirement, *Region Focus*, Fourth Quarter 2011.) The average duration of unemployment for workers older than 55 is 60 weeks, compared to 42 weeks for all workers. "At some point it's not worth continuing to look. You say, okay, I'll just retire early," Rothstein says.

Assessing the condition of the labor market is made more difficult by the fact that, in any given month, there is a great deal of fluidity between different states of the labor force. "There are a lot of issues in trying to think about what it means to be unemployed and what it means to be out of the labor force. People flit in and out of these states much more than we thought they did," Stevenson says. Many workers drop out of the labor force for several months, but then begin looking for work and reenter the labor market, according to research by Michael Elsby of the University of Edinburgh, Bart Hobijn and Rob Valletta of the San Francisco Fed, and Aysegul Sahin of the New York Fed. Deciding whether to classify these workers as unemployed or as out of the labor force "is a real philosophical question," says Stevenson. "You have to think about a distinction between people who truly exit the labor force, and people who take a one- or two-month break."

Looking more closely at the flows in and out of the labor force also reveals some counterintuitive trends. Because there are many more unemployed workers today than in previous recessions, the absolute number of workers who move from unemployment to nonparticipation has increased substantially. But it's actually taking longer for workers to become discouraged than they did in previous recessions, and on average, workers are less likely to drop out after being unemployed, according to research by Marianna Kudlyak of the Richmond Fed. Randy Ilg, an economist at the BLS, also found that unemployed workers are waiting longer before giving up and leaving the labor force, a median of 20 weeks compared to 8.5 weeks prior to the recession. One explanation for this trend could be the extension of unemployment benefits during the recession to up to 99 weeks; workers must be actively seeking work in order to qualify, which could encourage them to remain in the labor force for longer.

Despite the persistently weak labor market, Kudlyak also found an increase in the rate at which workers come back into unemployment from nonparticipation, possibly because many workers who had previously left the labor force, such as retirees, lost a significant amount of wealth and thus had to start looking for work. Another explanation could be the "added worker" effect, whereby nonworking women whose husbands were laid off decide to try to find a job, as Sahin of the New York Fed, Joseph Song of Columbia University, and Hobijn of the San Francisco Fed have suggested.

Passing the Time

Some workers leave the labor force for only a month or two, but others drop out for years, if not permanently. How are they spending their time? One recent study by economists Mark Aguiar of Princeton University and Erik Hurst and Loukas Karabarbounis of the University of Chicago begins to paint the picture. The authors examined the results of the American Time Use Survey (ATUS), an annual survey by the BLS that asks respondents to log their activities over a 24-hour period. Comparing the years 2009 and 2010 to the years prior to the recession, the authors found that about 35 percent of the foregone market work hours — time previously devoted to paid employment — were reallocated to home production, such as cooking and cleaning, home maintenance, or child care. About 30 percent of the foregone hours were devoted to sleep and television watching, 20 percent to other leisure activities such as exercising or going to the movies, and 10 percent of the time was spent on education or other civic engagements. Small fractions of time were devoted to work in the informal economy and to job search. The ATUS includes all workers — employed, unemployed, and out of the labor force — so it's not certain that these results apply specifically to workers who are out of the labor force.

About 15 percent of all workers not in the labor force and 8 percent of marginally attached workers are taking care of family members rather than looking for work, according to BLS data. For some of these workers, family care is the reason they leave the labor force, while for others, it's something they turn to after dropping out. "Men who have been out of work for a long time and are discouraged might start to say they're taking care of their family while their wives work, rather than saying they're discouraged," says Rothstein.

Many workers who have left the labor force are furthering their education. The share of adults aged 25-39 who cite schooling as their reason for leaving the labor force has increased from about 15 percent to about 20 percent since the end of the recession, and the share of workers aged 40-59 has increased from 4 percent to 6 percent, according to research by Julie Hotchkiss and Melinda Pitts of the Atlanta Fed and Fernando Rios-Avila of Georgia State University. Community college enrollment is especially countercyclical: A 1 percent increase in the unemployment rate leads to a 4 percent increase in enrollment, found Julian Betts of the University of California, San Diego and Laurel McFarland, executive director of the National Association of Schools of Public Affairs and Administration. The number of people over 50 enrolled in community college has increased 12 percent since 2005, with much of the increase coming since the recession, according to the American Association of Community Colleges.

The recession also likely accelerated the ongoing trend of young people opting for school over work, Stevenson says. "If you're in school full time and there are no jobs out there, eventually the returns to applying for another job instead of doing more of your homework are pretty low."

Making Ends Meet

Most social safety net programs, such as unemployment insurance or Temporary Assistance for Needy Families, require recipients to be working or actively looking for work. But people who have left the labor force might be taking advantage of other programs to help make ends meet.

On average, 45 million people per month received aid via the Supplemental Nutrition Assistance Program (SNAP), also known as food stamps, in 2011. That represents an increase of 70 percent since 2007, according to the Congressional Budget Office. Part of the increase was due to expanded eligibility, including relaxed work requirements. Typically, to qualify for SNAP, able-bodied adults must be working or enrolled in a training program and looking for work. These requirements were waived in 2009 and 2010 by the American Recovery and Reinvestment Act, and since then states that qualify for extended federal unemployment benefits — 46 states in fiscal year 2012 — have been allowed to waive the requirements. Even without the waiver, there are a number of exceptions, such as caring for a child, lack of transportation, or unsuitable or limited job opportunities, that could enable workers who have dropped out of the labor force to receive benefits.

> Men who have been out of work for a long time and are discouraged might start to say they're taking care of their family while their wives work, rather than saying they're discouraged.
>
> – Jesse Rothstein
> University of California, Berkeley

The recession also had an effect on enrollment in Medicaid, a government health insurance program for qualified low-income people. Between December 2007 and December 2009, the average monthly enrollment increased by nearly 6 million people, or 14 percent, according to the Kaiser Family Foundation. Medicaid eligibility is not tied to employment requirements, making it likely that at least part of the increase is due to workers who are no longer in the labor force, and thus have lower incomes and lack employer-based health insurance.

The expansion of benefits such as SNAP and Medicaid might be a cause of the sharp drop in the LFPR since the recession, rather than an effect. Economist Casey Mulligan of the University of Chicago found that more generous safety net programs have contributed to a decline in the "self-reliance" rate from 70 percent to 55 percent since 2007. The self-reliance rate measures the fraction of a household's income that is not replaced by transfer payments or subsidies; a lower self-reliance rate implies decreased incentives to work, since the government provides relatively more of a household's lost income. These programs replace much less income than disability benefits do, however, and thus might not have the same long-term effects on labor force participation.

Many workers, particularly older workers, are spending savings that had been earmarked for retirement. A survey by the AARP (formerly the American Association of Retired Persons) found that 57 percent of workers over age 50 had withdrawn money from their savings account, and 25 percent had completely exhausted their savings. Nearly 20 percent had taken a distribution from a 401(k) or other retirement account. A survey of workers of all ages by the Pew Research Center found that 55 percent of workers who were unemployed for six months or longer withdrew money from their retirement accounts. While the behavior of the unemployed might not match the behavior of workers who have left the labor force, it's likely that these groups have resorted to the same financial coping strategies.

Some workers simply might not be making ends meet. The official federal poverty rate increased to 15.1 percent in 2010, according to the U.S. Census Bureau, the highest rate since 1993. (The official poverty rate does not include in-kind government benefits such as food stamps in its income calculations.) There are some workers who will never reenter the labor force and "will live in poverty for the rest of their lives," says Rothstein. Most workers, however, will likely have to reenter the labor force at some point, albeit for lower pay. "You'll see more people coming back and working in jobs for which they should be overqualified."

Can the Decline be Reversed?

What happens when these workers do return to the labor force? The economy created 163,000 jobs in July, barely enough to keep up with population growth; some observers are concerned that if a large number of people decide to start looking for work, the result could be a spike in the unemployment rate. Demographic changes could offset the inflow of workers who sat out the recession, however. While the Congressional Budget Office projects that the size of the labor force will grow more quickly than its long-term trend between now and 2016 as the economy rebounds, it also projects that this growth will be outweighed by the retirement of the baby-boom generation, which will continue to push the participation rate down.

In fact, the greater concern may be that the labor force is permanently smaller. In the long run, a country's economic growth depends on the number of people working, and how productive those people are. All else equal, unless productivity grows very rapidly, lower labor force participation leads to a lower level of economic activity. That might be part of the explanation for the slow pace of the economic recovery, according to recent work by James Stock of Harvard University and Mark Watson of Princeton University (who is also a visiting scholar at the Richmond Fed). They found that the trend decline in labor force participation accounts for nearly all of the slower GDP growth and half of the slow employment growth relative to the recovery from the 1981-82 recession.

Some of the decline in labor force participation might be beneficial, at least in the long run. To the extent that workers have left the labor force in order to attend school, the effects on growth could be positive. Higher levels of human capital tend to lead to higher rates of economic growth; higher-skilled workers not only use existing technologies more productively but also generate new ideas and new technologies. Workers with more human capital also earn higher wages and tend to be more attached to the labor force later in life, potentially making up for a period of nonparticipation.

Millions of other workers, however, represent a large pool of unused resources. What will it take to bring these workers back into the labor force? If these workers are merely sitting out a weak labor market, then the short answer is job growth. But simply increasing the number of jobs might not be enough to bring certain workers back into the labor force, much less into employment. Research has found that marginally attached and discouraged workers tend to be from demographic groups with higher unemployment rates than average, and are less likely than the unemployed to transition to employment. In addition, skill "mismatch" — the idea that the available workers do not possess the skills in demand by employers — could account for between 0.6 and 1.7 percentage points of the 5 percentage point rise in the unemployment rate, according to Sahin and Giorgio Topa of the New York Fed, Joseph Song of Columbia University, and Giovanni Violante of New York University. This suggests that mismatch could account for a significant portion of marginally attached and discouraged workers as well.

For these workers, job training programs might be the best way to reintegrate them into the labor force. But job training doesn't yield immediate effects. "What should we be training for? For the jobs that will be there in three or four years?" asks Rothstein. "Adding more job training now is useful for the long run, but it's not going to be useful for the short run."

In the short run, there are no easy answers. The current low level of the labor force participation rate is a mix of both structural and cyclical factors, which makes it difficult to predict the path of the LFPR in the future, and thus to predict its effect on the country's economic growth. As the economy continues its recovery from the recession, economists and policymakers will be watching closely to see what labor force participation signals about the health of the labor market. **RF**

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PULLING UP STAKES

Have Americans lost the urge to move?

BY BETTY JOYCE NASH

A 23-year-old social media manager received a tempting job offer, complete with a salary increase. It seemed like a next step in the right direction — up. Except for one thing: The job was in Dallas and he lives in Denver. "I turned it down," says the young man, who asked not to be named. "I love life out here in Denver; I would not be happy in Dallas."

What's wrong with this picture? Americans are known for their itchy feet. Increasingly, however, many have been opting to stay put.

Early migrants journeyed west from Europe, then crossed mountains to farm, mine, and populate vast, empty territories; others poured into the growing cities of the 19th century. Throughout much of the 20th century, 8 million blacks and 20 million whites converged on cities in the Northeast, Midwest, and California from the South for social and economic reasons.

We move more than people of most other nations. Our domestic migration rate — roughly 5 percent to 6 percent of the U.S. population moves across a county boundary annually — both reflects and reinforces our dynamic labor market.

Domestic migration helps match workers to employers. It keeps labor markets supple. It smoothes shocks that may hit one region and spare another. Migration mitigates the effects of economic restructuring, such as population shifts that rearranged Americans geographically as the nation industrialized before and after World War II.

Moving may seem rooted in our national psyche, but the number of domestic migrants has been trending lower. The slide started in the 1980s, not with this decade's falling house prices and deep recession. The migration slump of the past three decades is a puzzling and possibly momentous change in America's social and economic picture. If the trend continues, labor market flexibility may be at risk. But the reasons for it are hard to pin down.

House Lock?

While it is tempting to assume that the recent housing contraction accelerated the migration decline, since an underwater mortgage makes moving harder, the data don't bear that out. Neither interstate nor intercounty migration rates fell more for homeowners than they did for renters in percentage point terms, according to economists Raven Molloy and Christopher Smith of the Federal Reserve Board of Governors and Abigail Wozniak of the University of Notre Dame in a 2011 *Journal of Economic Perspectives* article. The authors used data from the decennial Census, two long-term federal surveys, the American Community and Current Population surveys, and migration data from the Internal Revenue Service (IRS). Analysis of state-level data showed no statistically significant correlations between mobility and the share of homes with negative equity between 2006 and 2009. The authors also found no evidence that migration fell more in states where housing markets' sales or prices had larger declines.

Boston Fed economist Alicia Sasser Modestino and research associate Julia Dennett found similar results in a 2012 Boston Fed working paper. The authors analyzed IRS migration data between 2006 and 2009. Such "house lock" reduces the national state-to-state migration rate by a scant 0.05 percentage point, they concluded. That's about 110,000 to 150,000 fewer moves across state lines in a year.

Yet house lock is a reality for some. Stacy Pursell runs an executive search firm, the Pursell Group, based in Tulsa, Okla. She recruits employees for firms in the veterinary medicine and animal health industry. More candidates are refusing good positions, some because they're underwater on their mortgages. "I've been through other recessions," Pursell says, "but I've never seen this many people unable to relocate. Today I talked to a man who paid $650,000 for his home and could only get $425,000 if it sold today." He won't relocate. Companies have also cut back on relocation packages, making it tougher to find willing migrants. "We will have candidates enter the interview process only to say, at the end, 'I need to wait and stay here.' Every day I talk to people who feel stuck in their job."

A related explanation for declining mobility has been the severity of the latest recession, which has shrunk household formation and employment. For example, the number of households increased at a rate of 1.2 percent compared to a 2.3 percent annual rate of household formation between 2004 and 2007. To the extent that household formation triggers migration, the lower rate of new households could be deterring would-be migrants.

But the recession was not associated with any additional fall in interstate migration relative to the downtrend already under way, according to Greg Kaplan of the University of Pennsylvania and Sam Schulhofer-Wohl of the Minneapolis Fed, in a June 2011 Minneapolis Fed staff report. (Some news reports this year to the contrary were based on the effects of a 2006 adjustment to the Census Bureau's statistical procedures for its migration data rather than an actual deepening of the migration trend.)

So, what gives?

Who's Moving, Who's Not

Roughly 1.5 percent of the population moves between two of the four Census regions annually, and another 1.3 percent move to a different state within the same region, according to IRS data.

These averages hide differences among groups. Education, for instance, raises peoples' tendency to migrate while age lowers it. Renters are more than three times as likely to migrate as homeowners; the unemployed are twice as likely to move as the employed. Those with some college tend to migrate more than the less educated. Those aged 18 to 24 are about three times more likely to move than people 45-plus.

Still, mobility rates have declined for nearly every subpopulation since the 1980s, according to the 2011 article by Molloy, Smith, and Wozniak. Moreover, while U.S. demographics have changed since the 1980s, they have not changed in a way that would substantially affect overall migration. The population aged 45 to 64, for instance, expanded from 20 percent in 1981 to 25 percent in 2010. At the same time, the fraction of those older than 64 changed very little. The growth of the aged 45 to 64 group would have cut aggregate interstate migration by only 0.1 percentage point, according to Molloy and her co-authors' calculations.

The rise of the double-income household also does not seem to be responsible, even though relocating is a greater challenge for such couples, who need to find two jobs, not one. The trend toward double-income households was already largely complete by the time migration slowed. The percentage of households with dual earners has increased only modestly since then, from 42.4 percent in the 1980s to 45.6 percent in the 1990s. It was 45.2 percent in the 2000s.

But one segment of double-income households has seen a greater migration slowdown: the "power couple," dual-income households in which both partners are highly educated. While interstate migration rates for other types of families and for singles changed very little, the migration rate for college-graduate couples fell from 5.7 percent in 1965-1970 to 2.8 percent in 2000-2005, according to a 2011 working paper by Siyu Zhu, a doctoral candidate, and economist Li Gan, both of Texas A&M University. Two things affected this group's migration falloff: Women's wages grew and so did homeownership rates, which went from 62 percent in 1960 to 68 percent in 2000. The decreasing difference in spouses' earnings, which increases the opportunity costs of moving, explains half the decline in the interstate migration rate for families with two college-graduate spouses in the 1980s and 1990s.

Although education drives migration — people with bachelor's degrees are twice as likely to move as those with high school diplomas — rates in that group have slowed. Over the last three decades, college-educated people have moved at an average rate of 3 percent annually compared to 1.5 percent for those without a college degree. Between 2001 and 2010, however, those rates have dropped to 2.1 percent and 1.2 percent, respectively, according to Molloy and co-authors.

As education levels have climbed, one would expect migration rates to rise too. Nearly 28 percent of those 25 and over held bachelor's degrees in 2009, according to the U.S. Census Bureau, compared to 20 percent in 1990. "If I have education, I have more to gain and the benefits of a move are greater," says Mark Partridge, an economist at The Ohio State University.

"I can gain maybe tens of thousands of dollars [from moving], whereas if I have a job that requires less education, the gains are lower," he says. But despite rising education levels, overall migration rates are declining.

Partridge and his co-authors hypothesized that declining migration could mean that region-specific attributes may have evened out. That would mean migrants no longer seek specifics such as a particular climate or economic characteristics of a particular urban center. Goods and services across the nation are more similar now than ever. If location-specific characteristics have been capitalized into local prices, there's less need to move between regions.

But the authors found only a mild ebbing of natural amenity-based migration after 2000, Partridge says. He co-authored an article published in January 2012 in *Regional Science and Urban Economics* with Dan Rickman of Oklahoma State University, Rose Olfert of the University of Saskatchewan, and Kamar Ali of the University of Lethbridge.

They did find changes in regional labor markets, however. Comparing U.S. county population growth and migration between regions during the 1990s, they noted that labor flows responded to local economic shocks. After 2000, though, labor demand was supplied locally through reduced unemployment or added labor participation or both. "We didn't see the job growth sparking population growth," he says, which could indicate a shift away from migration flows across regions to supply labor, an important finding. "We might be entering a new normal of lower migration" he says. Maybe the gains from moving, for whatever reason, have dwindled.

There's always the possibility that current migration trends stem partly from the emergence of technology that has enabled telecommuting. The share of workers who report working from home is up from 2.1 percent in the 1980 census to an estimated 4.3 percent in the 2010 American Community Survey. More research is needed, but the growth in telecommuting seems unlikely to account for much of the migration decline, since telecommuting is often done by workers employed locally.

So far, economists know more about what isn't causing the migration slide than what is.

America is seeing a rise in a more exotic species of commuting: long-distance super-commuting, which anchors workers to their home cities.

The (Im)Mobile Future

Along with telecommuting, America is seeing a rise in a more exotic species of commuting: long-distance super-commuting, which anchors workers to their home cities. Researchers at New York University's Rudin Center for Transportation Policy and Management studied road warriors commuting more than 90 miles, one way, to work. These workers commute from one region to another by car, rail, bus, or air. For example, more than 3,000 people work in the New York area, but live in Boston, an increase of 128 percent since 2002. Super-commuters represent 13 percent of Houston workers, a nearly 100 percent increase over the same period; 35,000 live in Austin and 52,000 live in Dallas. Workers leave Houston, too, for Dallas, about 44,300 of them. In Los Angeles, 6 percent of workers are super-commuters, 36,000 from San Francisco. Nearly 5,000 people work in Chicago and live in St. Louis. In short, these are workers who are determined not to move, or cannot move, and pay a high price to avoid it.

Super-commuting corridors are growing throughout the nation, according to Mitchell Moss and Carson Qing at the Rudin Center. Two of recruiter Pursell's recent candidates accepted jobs — and extreme commutes — in a distant city when their company was bought. They rented apartments; they return home by plane on weekends. "Their families are back home, halfway across the country," Pursell says. While one plans to move when the house sells, the other is unlikely to move his family.

The question remains: Why the aversion to moving? Today's persistent and widespread decline in migration isn't related solely to demographics, employment, or the current economy. "This is not a great recession story. It's not just a housing story," Partridge says. "There's something else going on."

Perhaps a clue lies across the Atlantic, in Europe, where people don't move as much as Americans do. With the exception of some Scandinavian countries and the United Kingdom, the migration rate in every European country is lower than ours. A mere 1 percent of workers moved annually within European Union member states between 2000 and 2005, according the Institute for the Study of Labor in Bonn.

"They are much more attached to their community, culturally," says Partridge. "Low migration is one reason why Europe's unemployment traditionally has been higher than that of the United States."

Are Americans feeling the same way, and acting on it? Are we opting to consume some of our greater prosperity over the past several decades in the form of greater stability?

Although mobility remains highly valued in America, every migrant has a story about going home. Migrations produce a "counter current," according to David Cressy in his book *Coming Over*. Modern estimates of the English population of New England in 1640 range from 13,500 people to 17,600. But roughly 21,000 settlers had departed England for New England during the prior decade. He estimates that as many as one in six New England migrants may have permanently or temporarily returned home.

Susan Matt, a history professor at Weber State University in Utah, argued in her 2011 book *Homesickness: An American History* that attachment to place has always been embedded in the American story. Hidden in the migration narrative, she wrote, are the people who not only emotionally longed for home, but actually returned. "Although millions end up staying, they often set out with the belief that they will soon return to England, Italy, China, Poland, or Mexico." Matt noted, "For many, the American dream has always been to come to America, get rich, and return home."

The blacks and whites, too, who migrated north for opportunity in the last century also got homesick. Many of those migrants returned south later in the 20th century, often at retirement, once economic and social conditions improved.

Geographical attachment, if that's the force behind the current mobility decline, may mean a worker has to weigh cash against the comfort of the familiar. Last year, Susan Philipp, 53, decided against moving from Las Vegas to Sacramento where the property development firm for which she'd worked for 10 years relocated its home office after the housing bust. She was vice president of the property-management division. It was a good job, but she had lived in Las Vegas for 25 years. She and her husband enjoy strong community ties. They have friends — he in his trap-shooting league and she in her real estate networking group. She also sits on the county zoning board, a position through which she helps shape their home city.

"I loved that job. I loved that company," she says. "But sometimes you have to look at what makes sense for you in the long run. And sometimes, it's just a job." **RF**

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Testing Charter Cities

Can new cities with better rules accelerate economic growth in Honduras and other developing nations?

BY KARL RHODES

Most major cities grew gradually over many years based on the advantages of their locations. But down through the centuries, a few cities have experienced explosive growth driven by novel rules and social norms.

Legal gambling, for example, quickly transformed Las Vegas from a desert water stop into one of the world's most successful entertainment destinations. Religious freedom became the main attraction to Philadelphia as it grew rapidly from a small Quaker village into the largest and most modern city in the British colonies. A market-based economy and British common law converted Hong Kong from a rocky island off the coast of China into a major center for international trade and finance.

Today, many prosperous cities offer religious freedom, the rule of law, and free enterprise — not to mention casino gambling. Yet many people are stranded in nations that lack the basic institutions that drive economic growth. Economist Paul Romer, of New York University's Stern School of Business, is trying to accelerate the global evolution of better rules by promoting his concept of charter cities — largely autonomous metropolises built from scratch — that would attract the hundreds of millions of people who are expected to migrate from rural to urban areas by the middle of this century. Charter cities promise to offer better institutions than those found in many countries.

Economists recognize the vital role of strong institutions — such as legal structures, market mechanisms, and financial systems — in the development of prosperous nations. Romer boils this concept down to the simpler idea of better rules, most importantly provisions in charter cities for free entry, free exit, and equal protection under the law. In addition to better rules, each charter city would provide enough uninhabited land to accommodate millions of people. Residents could move in and out from host countries and from other nations around the world. Romer believes this new competition would accelerate the adoption of better rules globally.

People have applauded Romer's idea, which emerged from his highly influential academic research into how bad rules and antiquated social norms can slow down the application of beneficial new technologies. *Foreign Policy* magazine named him one of the "top 100 global thinkers of 2010," and *Harvard Business Review* listed his charter cities proposal among its "breakthrough ideas for 2010." But Romer wants charter cities to become more than an interesting concept; he wants to bring the idea to fruition. So in 2008, he formed a nonprofit organization called Charter Cities to encourage nations to try it.

The president of Madagascar expressed strong interest in 2009, but his political rivals forced him to resign (for unrelated reasons) before he could begin to implement Romer's proposal. But as one door closed, another one opened: A few months later, a coup occurred in Honduras, and officials from the country's new administration contacted Romer. By February 2011, the Honduran National Congress had amended its constitution to authorize a special development region — the Región Especial de Desarrollo (RED). And in July 2011, the Honduran congress passed a constitutional statute that broadly defined how the RED would be governed.

To help insulate the special zone from future political instability, the Honduran congress gave it a high degree of autonomy, but it stopped short of giving up sovereign control. The land would remain part of Honduran territory, and the government would place it in a trust to be managed by

PHOTOGRAPHY: KINGWU/VETTA/GETTY IMAGES

PHOTOGRAPHY: WFP/HETZE TOSTA

Can a charter city do for Honduras what Hong Kong did for China?

RED authorities, including a governor and a Transparency Commission, both appointed by the president of Honduras.

The RED's ability to govern itself includes the authority to regulate currency. "Narco-trafficking and bribery are major challenges in Honduras," Romer explains. So the enabling legislation gives the RED the option to ban the use of physical currency. "The idea was not so much that a cash ban would be a panacea for crime, but that it could make illegal transactions and bribery more difficult and costly and send a clear signal about how law enforcement in the new zone will be much more stringent." This cashless option is an example of how Honduras has adapted Romer's charter cities idea to its own circumstances.

Nonetheless, Romer remains at the forefront of the RED initiative. President Porfirio Lobo appointed him to the interim Transparency Commission, and its members elected him chairman. (Romer has pledged not to profit financially from his involvement in the RED.) Other members of the commission include George Akerlof, professor of economics at the University of California, Berkeley and a Nobel Memorial Prize winner; Harry Strachan, founding partner of Mesoamerica, a consulting firm based in Costa Rica and Colombia that makes social investments through its foundation; Ong Boon Hwee, former chief operating officer of Singapore Power; and Nancy Birdsall, president and co-founder of the Center for Global Development, a nonpartisan think tank in Washington, D.C., that develops ideas and promotes policies to reduce poverty.

Initially, the Transparency Commission would oversee the RED's legislative and executive functions, including the governor. As a check on the commission's authority, Honduras retains the power to change the RED's enabling legislation with a two-thirds majority of the Honduran congress and a referendum among residents of the RED, but Romer expresses confidence that Honduras will stay the course. The Honduran Congress is currently fighting off a constitutional challenge to the RED while working to determine the boundaries of the zone, which is expected to be 1,000 square kilometers, or about the size of Hong Kong.

Comparisons to Hong Kong are inevitable. Located in China, the semi-autonomous city-state grew rapidly after World War II under British common law and a market-based economy. Seeking to replicate that success, Chinese leader Deng Xiaoping established four special economic zones that also prospered, beginning with Shenzhen in 1979. He later opened 14 additional coastal cities to foreign investment.

"Britain inadvertently, through its actions in Hong Kong, did more to reduce world poverty than all the aid programs that we have undertaken in the last century," Romer says. There are many differences between Hong Kong in the 20th century and Honduras in the 21st century, but Romer believes the basic question remains the same: How can people in developing countries get better access to jobs in well-run cities?

"My focus on the potential for new cities in reform zones is an applied approach that I hope will lead to deeper insights about the dynamics of rules," Romer says. "Human progress is driven by the co-evolution of technologies and rules."

Lawyers, Guns, and Money

People can create new cities from scratch, "but it is complex, and the amounts of money involved can be very large," says Homi Kharas, deputy director for the Global Economy and Development Program at the Brookings Institution in Washington, D.C. He agrees that better rules could significantly boost economic development in the RED as long as investors are confident that Honduras will maintain its commitment to better rules.

"In order for this to work, one has to have some new institutional structure that enforces long-term credibility," Kharas says. "Whether or not that has to be backed up with military power and support is an open question. It certainly has to be backed up with legal and judicial enforcement."

To address that issue, the Transparency Commission plans to collaborate with partner countries that would help ensure the rule of law. "I had always imagined that the host [nation] and the partner countries would agree to the governance arrangement beforehand," Romer says. But the Hondurans realized that process could take longer than the political window they had to move forward. "Instead of reaching out to their allies beforehand, they drafted enabling legislation that leaves open opportunities for ample foreign participation."

For example, the island nation of Mauritius, off the southeastern coast of Africa, has agreed in principle to allow its supreme court to hear appeals from judicial cases in the RED. Mauritius has become one of the most prosperous countries in Africa since gaining its independence from Britain in 1968. It is a stable democracy with free elections and a positive human rights record. It also has attracted considerable foreign investment, partly by developing a special export-processing zone that eventually led to lower trade barriers throughout the nation.

The Mauritian commitment is a start, but to attract enough financing to build a metropolis from scratch, the RED would need the sanction and protection of the United States to ensure stability, Kharas says. The United States is looking for alternatives to traditional foreign aid, particularly proposals that link foreign aid to trade and investment opportunities, he notes. "But usually those types of activities start off as small pilots. The difficulty with the charter city idea is that it is difficult to pilot on a small scale."

If not the United States, how about Canada? In April 2012, Romer and Brandon Fuller, director of the Charter Cities nonprofit, broached the subject in a paper published by the Ottawa-based Macdonald-Laurier Institute, a think tank that explores Canadian public policy issues. Fuller and Romer argued that Canada is particularly well-suited to partner with Honduras. "As a model of good governance in the Americas, Canada operates according to well-established rules and sensible reform," they wrote. Based on survey data from 2007-09, Gallup estimates that 45 million adults living elsewhere in the world would move to Canada permanently if they had the chance. Of all the countries in the world, that preference was second (a distant second) only to the United States.

Generous immigration policies alone cannot satisfy "this pent up demand for more Canada," Fuller and Romer wrote. But Canada could export its good governance by playing a strong leadership role in the RED. They suggested many possible areas where Canada could provide expertise including procurement, border control, customs, taxes, and law enforcement. The Royal Canadian Mounted Police, for example, could train and supervise police officers.

In late May, Romer outlined the Honduran initiative for the Committee on Foreign Affairs and International Development in Canada's House of Commons. Some members of the committee expressed interest, but none of them seemed ready to endorse the idea of Canadian participation.

Migration Power

Early American colonies attracted migrants who were ambitious, courageous, and determined enough to cross the ocean seeking better opportunities. So it is not surprising that these colonies prospered in the long run. The same was true for many American pioneers who pushed west — sometimes at the expense of the indigenous population — seeking natural resources, greater opportunities, and the chance to make their own rules in some cases. Romer and Fuller have contended that developing charter cities could "re-create the frontier conditions that give people new and better options" without conquest and coercion.

Today, the mobility of the world's population is limited not so much by the availability of arable land but by political barriers. North Koreans, for example, cannot simply stroll through the demilitarized zone to South Korea. Likewise, millions of eager migrants are trapped in African nations that are plagued by drought, famine, war, and corruption.

"The gains from eliminating migration barriers dwarf — by an order of magnitude or two — the gains from eliminating other types of barriers," wrote Michael Clemens in a 2011 article in the *Journal of Economic Perspectives*. Clemens is a senior fellow at the Center for Global Development. "For the elimination of trade policy barriers and capital flow barriers, the estimated gains amount to less than a few percent of world GDP," he continued. "For labor mobility barriers, the estimated gains are often in the range of 50 percent to 150 percent of world GDP."

Kharas notes, however, that the biggest migration gains are generated by people moving from poor countries to rich countries. "When doctors go from Mexico to the United States, their salaries, their value-added, goes up enormously," he says. "That same logic does not apply to migration from poor countries to other poor countries." Honduras in particular, with estimated per capita GDP of $4,300 in 2011, is among the poorest nations in the Western Hemisphere.

To reap substantial economic benefits from migration, the RED would have to succeed on a scale that would significantly improve the labor market of the entire country, Kharas says. But if the RED could provide better rules and opportunities for millions of people, and Honduras only has about 8 million residents, then why not apply the charter city concept to the entire country?

Cities From Scratch

It's often said that the three golden rules of real estate development are location, location, and location. Honduran officials have yet to define the boundaries of the RED, but Romer expects them to set aside uninhabited land with access to the coast.

"Here you are taking a place that was not a prime location to begin with, and you are trying to make it a special place," says Vernon Henderson, professor of political economy at Brown University. Perhaps better institutions alone will attract waves of immigrants and foreign direct investment to the RED, but Henderson doubts it. "You have to give them other forms of subsidies," he predicts. "You have to invest in infrastructure to try to overcome any deficiencies in the location."

Henderson says it would be difficult for a poor nation like Honduras to pump lots of money into a charter city. "I will be surprised if that actually happens because I think it will get bogged down politically," he says. "I understand that everyone is wildly enthusiastic now, but eventually you have to turn to the nitty-gritty of how you are going to put infrastructure in there."

Kharas is somewhat more optimistic about the prospect of building a city from scratch. The area of mainland China across from Hong Kong has sprung up from almost nothing, he notes. And so has the Iskandar project across from Singapore in Malaysia. Iskandar is an initiative of the Malaysian federal government and the Johor state government to develop a special economic zone to capitalize on

Singapore's success. "So it is possible to create new cities that end up being very dynamic," he says.

Clearly, location will be important to the RED, but Kharas is more concerned about how quickly the RED can achieve economies of scale and the economic and social networks that make cities efficient. On this point, Henderson agrees. "A lot of the efficiency of working in cities comes from networks and interchange of ideas and interchange of goods between firms and what goes on in a dense urban environment," he says. If those networks do not develop quickly, Henderson predicts that the economic base of the city will be limited to foreign direct investment — labor-intensive manufacturers that are looking for cheap labor in a stable environment where their factories are less vulnerable to expropriation.

"Investors are concerned about headline-grabbing expropriation in some parts of the developing world," Romer concedes. "But the much more salient risk is death by a thousand cuts — the ex-post manipulation of contracts in areas that involve shades of gray, be it by government officials or firms that specialize in exploiting weak governance." The RED's enabling legislation attempts to assuage such fears by instituting independent law enforcement and judicial functions and by allowing partner countries to appoint members to the Transparency Commission. Also, contract disputes in the RED could be subject to international arbitration and review by the Mauritian Supreme Court. Critics have charged that achieving stability via foreign influence and control amounts to neo-colonialism, but Romer argues that colonialism was based on coercion and condescension, while charter cities are based on giving people and governments more and better choices.

Who Gets What?

If the RED can achieve stability, credibility, and critical mass, it might be able to leapfrog ahead of other Central American cities that are encumbered by inefficient rules, just as Hong Kong and Singapore vaulted over more established Asian cities. If that happens, Honduras would gain a booming new city, more international credibility, greater impetus to improve its rules, and a viable alternative for thousands of Hondurans who take great risks to move illegally to the United States each year.

Partner countries would support the RED to promote peace, stability, and prosperity in a developing nation — and because it's the right thing to do, Romer says. "Risk has not kept countries and international financial institutions from participating in traditional large-scale aid projects in the past," he adds. "The important thing now is to recognize that the traditional approach has had only modest success and then develop a willingness to try something different." By helping to set up better systems of governance, partner countries could have a more lasting impact on developing countries.

The United Nations expects the urban population in developing countries to double from 2.6 billion to 5.2 billion by 2050. "Under conditions of policy-as-usual, people will flock to slums that surround cities whose governments either do not want additional residents or are incapable of accommodating them," according to Fuller and Romer. "This needn't be the case. The coming wave of urbanization has the potential to dramatically reduce global poverty, and to do so in a way that is not dependent on aid or charity."

Romer is staking his growing reputation as a socioeconomic entrepreneur on the idea of charter cites. "The job of every economist is to make the world a better place," Romer told a Honduran newspaper last year. "Some economists do this by developing theories about how an economy works. This is what I did in the early part of my career," he said. "Now I want to make a practical contribution, a real difference in people's lives. ... My hope is that in the near future, every family on earth can choose to move to one of several different cities that are all competing to attract new residents," he concluded. "It would be the reward of a lifetime for an economist like me if I could help the world take even a small step toward achieving this dream." **RF**

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The Sharp Rise in Disability Claims

Are federal disability benefits becoming a general safety net?

BY JOHN MERLINE

One of the often-told stories of the anemic economic recovery has been the dreary prospects for workers. As of July 2012, there were 811,000 more long-term unemployed than when the recession officially ended in June 2009, and there were 412,000 more who had given up looking for work. The Bureau of Labor Statistics' expanded unemployment measure was 15 percent in July 2012.

As a result, discouraged workers are increasingly dropping out of the labor force. While the number of people with jobs has climbed 2.7 million since June 2009, the pool of Americans who aren't in the labor force at all has shot up by 7.5 million.

A great many of these people will likely never come back to the workforce even if the economy does rebound: not because they've aged into retirement but because they've signed up instead to get disability benefits — joining the federal government's Social Security Disability Insurance (SSDI) program. This program, started in the late 1950s, was meant to provide much-needed benefits to those who were too disabled to work, but weren't yet eligible for Social Security benefits. The current massive exodus of workers to the disability rolls could have worrisome implications for the solvency of the SSDI program — which is scheduled to become insolvent in less than four years — as well as the federal government's broader entitlement spending problem. The shift could also cut the growth potential of the U.S. economy by permanently shrinking the available pool of labor.

How a Law Changed Incentives

The scale of the issue is significant. In just the first six months of 2012, almost 1.5 million workers applied to get into the SSDI program. That's more than applied in the entire year in 1998. Last year, SSDI received 2.9 million applications, which is nearly double the figure from a decade earlier. Since the economic recovery started, more than 8 million have applied for disability benefits. If recent history is any guide, more than a third of those who apply will get on the program within months.

As a result, the number of SSDI enrollees is climbing quickly. Through August of this year, more than 653,000 workers were awarded disability benefits, and over the past three years, more than 3 million joined the program. Even after accounting for those who exit SSDI — either because they age into retirement, die, or are removed from the program — the number of workers on disability has climbed by more than 1.1 million since June 2009, a 15 percent increase.

Today, there are 6.6 people on disability for every 100 people actively working. That's double the ratio from 20 years ago, and almost three times what it was in 1972. Consequently, spending on the program has more than doubled in the past decade, and SSDI now accounts for almost 20 percent of Social Security's budget, up from 10 percent in 1988.

The recent growth in SSDI is part of a longer-term trend. After remaining relatively flat throughout the 1980s, enrollments and costs started their upward march in the early 1990s (see charts). Coincidentally, that was just about the time President George H.W. Bush signed the Americans with Disabilities Act, a law designed to end discrimination against disabled workers and provide them more opportunities to stay in the workforce.

The growth comes despite the fact that the physical demands of most jobs have decreased, the average health of adults has improved, and prevalence of mental disorders in the country hasn't changed, while treatments for mental illnesses have greatly expanded. Research by Mark Duggan of the University of Pennsylvania and Scott Imberman of Michigan State University found, for example, that the health of adults between ages 50 and 64 showed substantial improvement between 1984 and 2004.

Nor does the aging of the U.S. population appear to be responsible. In fact, the average age of those awarded SSDI benefits is lower than it was in the 1980s for both men and women. The average age dropped to 49.5 in 2010 for men, from 51.2 in 1980; among women the average age fell to 48.8 years from 51.1. Almost 53 percent of men awarded SSDI benefits in 1980 were over age 55. By 2010, only 42 percent were. Among women, 51 percent of those who enrolled in 1980 were over age 55, but just 36 percent were in 2010.

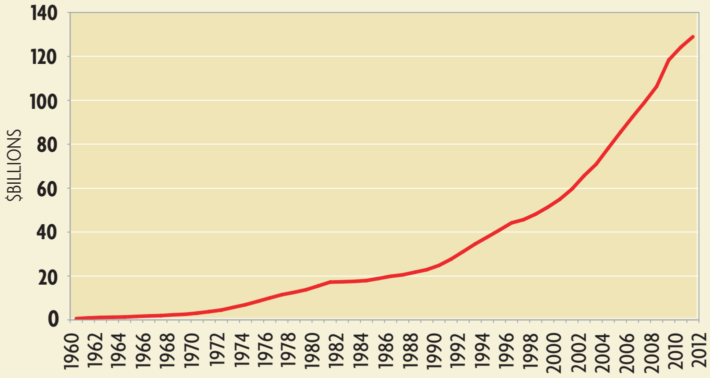
What, then, explains the rapid rise in the ranks of the disabled? The biggest driver seems to have been a change in the eligibility rules enacted in 1984. When the program was added to Social Security, the goal was to have it provide early retirement benefits for those were "totally and permanently disabled."

But the 1984 change "substantially liberalized the disability screening program," according to economists David Autor of MIT and Duggan in their extensive review of the program. The reforms shifted screening rules from a list of specific impairments to a process that put more weight on an applicant's reported pain or discomfort, even in the absence of a clear medical diagnosis. In addition, workers could qualify if they had multiple conditions that affected their ability to work, even if none of the conditions was disabling on its own.

Not surprisingly, more and more workers were awarded disability benefits based on ailments that relied more on patient self-reporting and that often were not easily diagnosed independently. For example, "musculoskeletal and connective tissue" problems, which includes back pain, accounted for just 17 percent of new enrollees in 1981, but 33 percent in 2010. The share of awarded benefits based on mental disorders — ranging from schizophrenia to mood disorders such as depression and bipolar disorder — climbed from 10 percent in 1981 to 21 percent in 2010. Mood disorders alone now account for 15 percent of all workers currently on disability.

Another driving force, Autor and Duggan found, is the fact that the value of disability benefits relative to wages has risen "substantially" since the late 1970s, because of the way initial benefits are calculated. That's particularly true at the lower end of the income spectrum. When the value of SSDI benefits and the value of the Medicare benefits that SSDI enrollees qualify for are combined, the share of income replaced by the disability program climbed from 68 percent in 1984 to 86 percent in 2002 among lower-income men aged 50-61. A possible indicator of the effect this has had, Autor and Duggan note, is that "the increase in [SSDI] enrollment during the last two decades was largest for those without a high school degree."

Federal Spending on Worker Disability (SSDI) Benefits



SOURCE: Social Security Administration

The Recession's Role

Still, there's little question that the last recession and the painfully slow recovery have contributed significantly to the program's growth in the past four years. According to data from the Social Security Administration, disability awards were climbing at an average annual rate of less than 2 percent between 2003 and 2007. But they shot up 8.7 percent in 2008, 10 percent in 2009, and 6.8 percent in 2010.

"The very recent recession of 2008-2009 resulted in an increase in disability incidence that was exceeded only by the incidence rate in 1975," Social Security Administration Chief Actuary Stephen Goss told a congressional panel in December. He added that "when employment is good, when employers are trying to employ lots of people, people with impairments, like everyone else, find it easier to find a job."

But when employment opportunities are scarce, some people who otherwise could work apply for disability instead. Duggan, for example, estimates that the higher unemployment rate in 2011 contributed to 3,000 more people applying for SSDI each week than would otherwise have occurred.

This is compounded by the fact that there are so many workers who, despite repeated extensions, have exhausted their unemployment insurance benefits. Matthew Rutledge, a research economist at Boston College's Center for Retirement Research, found that the unemployed are less likely to apply for disability when their unemployment benefits get extended, but are "significantly more likely to apply" when those benefits run out.

What's more, disability applications are continuing to go up even as the unemployment rate falls modestly, according to the Congressional Budget Office. Because of this, the CBO projects that the number of people on disability will "continue to rise over the next few years by more than otherwise would have occurred."

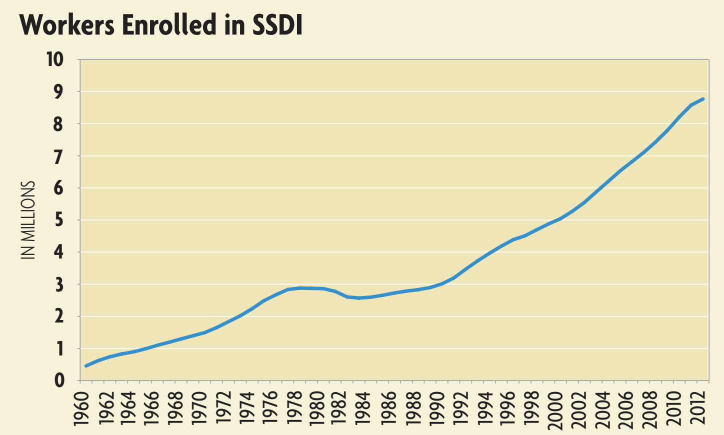
The fast-growing ranks of enrollees are putting increased financial strain on SSDI. According to the latest report from the Social Security actuaries, SSDI is currently scheduled to exhaust its trust fund in 2016, which is two years sooner than the program projected just a year before. The growth in SSDI enrollees is also accelerating the drive of Medicare toward financial distress; that's because after two years, disability enrollees qualify for Medicare coverage. By 2009, SSDI accounted for $70 billion of Medicare's budget, according to the CBO.

Then there's the economic impact of all these lost workers. Several experts who've examined the SSDI program have come to the same conclusion: Workers who get on federal disability almost never come back to work.

As Autor put it, "the program provides strong incentives to applicants and beneficiaries to remain out of the labor force permanently, and it provides no incentives to employers to implement cost-effective accommodations that would enable disabled employees to remain on the job."

Moreover, SSDI can keep workers from reentering the labor force for months, and sometimes years, as they work through the approval process, since by definition they can't get disability if they are still working. A little more than a third of those who apply get on the program within four months. Among those who are rejected, more than half appeal, a process that can take years to complete, during which time the applicants have to stay out of the job market. But since judges overturn the initial rejection 75 percent of the time, it's not surprising that so many stick it out.

At the same time, the lengthy approval process can impose serious financial harm on those in need. James Allsup, founder and CEO of Allsup, an SSDI representation company, told the House Ways and Means Committee, "An overwhelming majority of SSDI applicants face grave financial and personal setbacks while stuck in the federal disability backlog, including worsening illness, drained retirement funds or other savings, the loss of existing health



NOTE: 2012 figure through August
SOURCE: Social Security Administration

insurance, missed mortgage payments, and even foreclosure and bankruptcy."

The loss of all these workers — at least some of whom presumably could continue to be productive members of the labor force — can have a deleterious effect on the economy, "resulting in a loss to society of the economic contributions those workers could have made," according to a White House report.

How to Protect SSDI?

Despite these mounting problems, there seems to be relatively little discussion among policymakers about reforming SSDI. Reform is possible, however. That, at least, is the lesson taught by the Netherlands, which confronted a similarly difficult disability problem. The country enacted a series of reforms in the 1980s and 1990s, which included benefit cuts as well as incentives for employers who were asked to bear some of the costs of disability claims by their workers. In addition, a 2002 reform required employers and workers, along with a consulting physician, to put together return-to-work plans. These and other changes resulted in a sharp drop in the number of Dutch signing up for the country's disability program in the past decade.

In the United States, some suggest that Congress could resolve the problem simply by dedicating more of the money that comes in through the Social Security payroll tax to the disability program. Currently, SSDI is financed through a 1.8 percent payroll tax, which is part of the overall Social Security tax. "The current SSDI revenue problem could be solved by this type of small adjustment," David Heymsfeld, a policy adviser for the American Association of People with Disabilities, wrote in June on the group's blog.

While technically true, shifting money into the Disability Insurance program would also hasten the day when Social Security becomes insolvent (which is currently expected to occur in 2035), because it would take money currently dedicated to the Social Security trust fund and use it to pay disability benefits. At the same time, shifting the money around would do nothing to resolve the disability program's unsustainable growth trend.

Congress has a host of other changes it could make to the program that would reduce SSDI's enrollment and cost growth, according to academic and government analysts, although each could give rise to questions of fairness. Among the options would be simply to return to the pre-1984 eligibility rules, making it harder for people to get on the program without a specific medical diagnosis. Congress could also reduce the benefit amounts, which would in turn make SSDI a less viable alternative than work for those who are able to perform a job. Or it could restrict benefits based on income and assets.

Still another option would be to move more people off SSDI through what are called "Continuing Disability Reviews." Aggressive CDRs from 1980 through 1983 cut the disability rolls by about 10 percent. It's worth noting, too, that this decline occurred during the very deep and painful 1981-82 recession, which lasted 16 months and pushed the unemployment rate up to 10.8 percent.

Autor and Duggan have suggested a more comprehensive front-end approach, one that extends existing private disability insurance (PDI) into a universal PDI plan along the lines of unemployment insurance. The expanded PDI would provide partial income replacement, rehabilitation services, and other help for up to 24 months, all geared toward keeping those with partial disabilities in the workplace, or transitioning them to other suitable jobs. But the proposal is not without its own challenges, since it would be complex and would likely meet resistance from business communities required to buy the insurance.

The bottom line, though, is that once the SSDI Trust Fund is exhausted in 2016, Congress will have to act in one way or another to keep the program functioning and assisting the disabled who need the help. **RF**

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The Once and Future Fuel

Marcellus Shale harbors natural gas in varying depths under parts of West Virginia, Pennsylvania, New York, and Ohio. It also underlies portions of Maryland, Virginia, Kentucky, and Tennessee.

Shale gas brings back cheap energy, but what's the risk?

BY BETTY JOYCE NASH

PHOTOGRAPHY: DOUGLAS DUNCAN, U.S. GEOLOGICAL SURVEY

Shale deposits are yielding more natural gas than ever, thanks to advances in drilling technologies. Though drilling operations can disrupt communities, they generate business for local merchants and jobs. Mineral extraction is a two-way street. And it may be a congested two-way street. Just ask Don Riggenbach.

"I'm glad they're here, but there's stuff we have to endure," says Riggenbach, president of the Wetzel County Chamber of Commerce. The county lies along the Ohio River in northwestern West Virginia, and is a drilling hot spot. During a brief telephone interview, four dump trucks hauling gravel rolled down the main road where his business is located.

By 2035, almost half of the United States' natural gas may come from shale. One of the biggest fields, or "plays," of shale gas in the world, the Marcellus Shale, sprawls at various depths under chunks of West Virginia, Pennsylvania, New York, and Ohio; it also underlies small parts of Maryland, Virginia, Kentucky, and Tennessee. A different, smaller gas play underlies several counties in North Carolina.

Though the widespread development of shale gas promises comparatively clean and cheap fuel, along with jobs, tensions have flared over costs that could be imposed on society later — long-term effects on environment and health. All energy production poses some risks; even wind power, with its turbines, can kill birds and interfere with radar signals. Resource extraction always involves risk. And damage often shows up later, sometimes much later.

Fracking

Rising natural gas prices over the previous decade spurred the innovations that made these hard-to-reach deposits economically viable. Gas was first produced from the Marcellus formation in 2005, in Pennsylvania. Gas prices peaked in 2008 at $10.79 per thousand cubic feet (mcf); this, along with oil price spikes, helped drive the natural gas boom.

Drilling speeds and control have enabled the recovery of shale gas, according to West Virginia University geologist Tim Carr. Three-dimensional seismic imaging accurately pinpoints gas deposits. High-pressure sideways drilling, up to three miles out, puts more shale within reach. Injections of 3 million to 5 million gallons of chemicals, grit, and water shatter the shale. The water flows back to the surface; the grit holds the shale open so the gas can migrate through. This high pressure drilling with water is known as hydraulic fracturing, popularly called "fracking."

Fracking water is 0.5 percent additives, which amounts to about 15,000 gallons of chemicals in a 3-million gallon injection, according to the U.S. Geological Survey. The recovered water may hold brine, heavy metals, low levels of radioactive contaminants from decaying uranium, and volatile organic chemicals, which can include carcinogens such as benzene. Water in the Marcellus region also may contain naturally occurring methane. (Natural gas is composed mostly of methane.) Though it's not considered a health threat in drinking water, concentrated methane displaces air and poses explosion risks if not well ventilated. Methane from abandoned gas wells, underground coal mining, underground gas storage reservoirs, and shallow, naturally occurring gas can contaminate groundwater. It's hard to evaluate the risk of gas drilling on water supplies because few empirical studies exist that use before-and-after well tests.

Public Goods

Many environmental resources, such as clean air or water, are considered "public goods." It can be hard to establish systems of property rights for these goods.

And environmental protection can be expensive. Firms make trade-offs between profits and the environmental risk. "Revenues are typically realized quickly, but environmental damages impose costs over many years," writes economist Lucas Davis of the University of California, Berkeley, in a paper published in June by the Brookings Institution. Firms can go out of business or be otherwise unable to finance cleanup, which leaves the bill with taxpayers.

People worry, for instance, that chemicals in fracking water can contaminate ground and surface waters. Underground aquifers supply fresh water for wells, usually in rural areas; municipal water systems draw drinking water from rivers and lakes. It's unclear whether chemicals can migrate from fractures into aquifers.

Reports of water contamination from hydraulic fracturing have surfaced, but few, if any, peer-reviewed studies have documented either the problem or its absence. It's difficult to definitively link a particular contamination event directly to shale gas operations, according to Sheila Olmstead, an economist at Resources for the Future (RFF). In 2011, though, the Pennsylvania Department of Environmental Protection fined Chesapeake Energy a record $1 million for contaminating private wells through improper gas well casing and cementing.

Michael John is president of Northeast Natural Energy, based in Charleston, W.Va. "The source of peoples' water needs to be evaluated, tested prior to activity undertaken by us or any other operators in proximity," he says. "That provides everyone with a baseline as to what the water quality is in those areas." West Virginia law now requires pretesting of wells within 1,500 feet of the well pad.

A 2011 study found measurable amounts of methane in 85 percent of 60 wells sampled in Pennsylvania and New York, though the study found no evidence of drilling fluids in well water. The study indicates methane levels were 17 times higher, on average, in wells located within a kilometer of active shale gas drilling sites, according to Stephen Osborn, Avner Vengosh, Nathaniel Warner, and Robert Jackson of Duke University's Nicholas School of the Environment. The chemistry in the well water matched the methane's composition from local gas wells.

Some drilling wastewater also ends up in municipal treatment plants, but it's unclear how effectively it's treated there. In its study of shale gas development, RFF is investigating state data from such plants in Pennsylvania. "We know where the water quality monitors are in relation to those water treatment plants," Olmstead says. "If there's a signal to pick up, we're hoping we can pick it up."

Methane in the air poses risks, too, which could weaken that bridge to a low-carbon future, says Alan Krupnick, also an RFF economist. Methane traps even more heat than carbon dioxide — it's a potent greenhouse gas. Methane from gas wells can escape or is burned off at various stages of production. John notes that drilling companies do not want to burn methane unnecessarily since they can't sell the lost gas, but some methane flaring is necessary, to stabilize the flow into the pipeline, which avoids unwanted combustion.

Also, wells in various stages of production can emit chemicals into the air, including benzene and hexane, which can cause cancer and other serious health effects. A new EPA rule requires operators to capture air pollutants starting in 2015. In the meantime, an estimated 13,000 new and existing natural gas wells are fractured or re-fractured each year; about 25,000 new wells are drilled annually.

Though one well may be only the diameter of a bowling ball, a drilling operation can cover two to 10 acres; they've altered the landscape in Marcellus country.

Expanded Footprint

The image of one lonely pump-jack drawing oil or gas on a quarter acre has been replaced by shale drilling operations that can include multiple wells, pipelines, condensate tanks, and processing stations. (John notes that, to drain the equivalent amount of gas from one drill site today, producers would have to drill many separate wells on many separate sites, which would require more roads, more pipelines.) Though communities may suffer environmental and health damages, the resource can power the local and national economy, providing jobs.

In New Martinsville, W.Va., "wet gas" deposits have sparked a drilling boom. Wet gases are so named because they can be liquefied into higher-value products such as ethane and butane. The shale gas boom there provokes mixed reactions.

"The roads are being torn up because of heavy trucks, and the traffic through this little town is probably — this is not an exaggeration — at least three times what it is normally," Riggenbach says. "Now we have gas drillers coming in, not setting down roots, not buying household items like carpet and refrigerators." He owns a carpet and tile business. The increase in traffic, though, means "gas stations, restaurants, motels are all packed, all busy, and that's a good thing."

Natural gas' outsized footprint also affects people who don't own oil and gas rights to their property. In West Virginia, surface ownership may have been sliced off from the underground resource rights more than a century ago. Morgantown, W.Va., attorney Jay Leon argues that the law applies 19th century legal concepts to 20th century drilling techniques.

"The net of that is you've got much greater impositions placed on surface owners: These are very large, industrial-scale operations," Leon says. "In some cases, they go in 24 hour-seven-day-a-week operational cycles and last for months. Before, they drilled shallow wells, and were off the property in a month."

Cases about surface owner rights are making their way through state and federal courts. At the same time, states and localities are changing laws as shale gas development spreads. West Virginia recently changed its minimum setbacks from homes to a distance of 625 feet from 200 feet, measured from the center of a shale gas well pad. Pennsylvania recently passed a new law, Act 13, regulating the industry and instituting user fees. "It was imperative that rules be modernized and strengthened," says John Hanger, who served as secretary of the Pennsylvania Department of Environmental Protection from 2008 to

2011. “The old laws didn't reflect the volumes of water, materials, trucks, and the amount of gas now being produced.”

Act 13 also contains a controversial provision that established statewide zoning for oil and gas operations and preempted local zoning ordinances. From the industry's perspective, notes economist Krupnick, uniform zoning rules are desirable because it's difficult to deal with a plethora of localities. But, he adds, people may have different preferences in different places. (Half of Pennsylvania's townships have no zoning laws.)

It's unusual for the legislature to pass a statewide ordinance singling out an industry, says William Johnson, the attorney who represents the Pennsylvania townships of Peters and Mt. Pleasant in a lawsuit challenging the provision. “We're not against the industry,” he says. “It's been a huge economic boom in this state. At the same time, there is a price to pay for that. We think the removal of local authority is too high a price, and not a legal price.” This provision was ruled unconstitutional by the Pennsylvania Commonwealth Court in July. The state has appealed to the Pennsylvania Supreme Court.

As more and better science emerges about changes in water and air quality from shale gas development, and as economists study public preferences, it will be easier to understand how people value those changes and compare costs to benefits. For instance, if regulation is necessary to mitigate possible damage, then tighter standards would raise the price people pay for natural gas. How much would people be willing to pay to cut air pollution, for example? An 18-month study under way at RFF will highlight, among other things, which shale-gas activities are associated with risks that bother people the most, and identify how regulations and voluntary industry responses can affect those risks.

As an example of a voluntary response, many energy companies now manage water in a way that lessens the risks of spills and saves money. Rather than transport millions of gallons to drill sites, some firms keep the water on site or recycle it or both. That cuts the number of tanker trucks driving local roads and the risk of rollovers and spills into surface waters. Chesapeake Energy saves an estimated $12 million a year in its Eastern Division with recycling, according to Stacey Brodak, senior director of corporate development. In northern Pennsylvania, Chesapeake recycles nearly 100 percent of produced water.

Northeast Natural Energy also recycles wastewater, according to Michael John. “To the extent that we don't have immediate applications for produced fluid, other producers would have use of it. In the event that's not an option, our practice is to transport it to licensed underground injection wells, operated in a way that places the fluid back at geologically appropriate levels.”

The industry is addressing these and other problems, says spokesman Travis Windle of the Marcellus Shale Coalition, a trade group of energy firms and suppliers. “We live here. My six-week-old kid lives here. My parents have a rig behind their house. Like everything else, it's about managing risk.”

Northeast Natural Energy's shale gas drilling operation is located in the Morgantown Industrial Park in Monongalia County, W.Va.

PHOTOGRAPHY: NORTHEAST NATURAL ENERGY

Risks that aren't managed well may leave toxic legacies. Pennsylvania, for instance, still suffers pollution damage from before the 1972 Clean Water Act. The pollution from some orphaned coal mines drains into the Chesapeake Bay.

Staying in the Game

Mineral extraction brings jobs and money, but in cycles. The natural gas industry in West Virginia employed almost 10,000 workers until 2008, with jobs mostly in construction and support activities. That number fell below 8,000 during the recession. Resource-rich states typically tax coal, natural gas, oil, timber, or other minerals to weather downturns, to offset the localities' costs (such as environmental remediation, regulation, and infrastructure repair), and bolster revenues in general.

The money can help areas, such as the southern West Virginia coal fields, recover as an extractive industry declines. For example, coal mining counties have median household incomes below the state's average, and family poverty rates above average, according to a 2011 study by the West Virginia Center on Budget and Policy. Health outcomes rank among the worst in eight of the 10 counties.

About 36 states impose these severance taxes to balance the costs and benefits of volatility. West Virginia has levied severance taxes on oil and gas and coal since the 1980s; the taxes represented 11 percent of its general fund revenues in fiscal 2012. Severance tax revenues are falling, though, as coal production and natural gas prices decline.

The current glut of “dry” natural gas has shifted production away from those wells and into “wet” gas regions like Wetzel County. A native West Virginian, John has been in the energy business for 30 years. Of the high oil and wet gas prices coupled with the low dry gas prices, he quips, “Our industry is accustomed to boom and bust, but we're not used to both at the same time.”

Yet the soft prices don't bother him. “It's an excellent time to accumulate dry gas properties,” he says. Analysts say demand will rebound, partly through fuel switching for power generation.

The Once and Future Fuel

But future shale gas yields are uncertain and evolving. Original estimates of the Marcellus Shale's "unproven technically recoverable" gas have been more than halved, from 410 trillion cubic feet to 141 trillion cubic feet, according to the U.S. Department of Energy's *Annual Energy Outlook 2012*. Revised estimates forecast the Marcellus supply at about six years' worth of U.S. gas demand.

The estimates will continue to be tweaked as drilling continues, says John. "It could last for decades. I think it will. I'm expecting my kids, *their* kids, and maybe even their kids to participate in this business for a long time."

The plentiful supply and low prices may hasten fuel-switching. Trucks running on liquefied natural gas (LNG) would cut U.S. oil imports and carbon dioxide emissions; LNG would be cheaper than diesel fuel. (The interstate trucking industry's transition to a hub-and-spoke system may ease the problem of establishing LNG fueling stations.) Chesapeake Energy, the second largest U.S. natural gas producer, has invested $150 million to develop 150 liquefied natural gas fueling stations.

Low natural gas prices have also spurred electric utilities to rebalance energy portfolios to avoid installing carbon controls. Carbon dioxide emissions from natural gas are about 45 percent lower per British Thermal Unit (Btu) than coal — and bring no soot, no mercury. (A Btu is the amount of energy it takes to heat a pound of cold water by one degree Fahrenheit.) Dominion Virginia Power predicts that by 2017, natural gas will represent 23 percent of its electricity generation, compared to 12 percent in 2011.

"It's a game changer, there's no doubt about it," says Jim Norvelle, director of media relations at Dominion, parent company of Dominion North Carolina Power and Dominion Virginia Power. "For the near future, this company is building either gas-fired or renewable stations." And Dominion plans also to convert its import terminal in Baltimore to one for exporting LNG, for which demand is expected to grow, especially in economies such as China's.

The shale boom, environmental rules, lower economic growth, and other factors have prompted coal plant closings. In July, the Energy Information Administration reported that plant owners and operators expect to retire about 8.5 percent of 2011 coal-fired capacity between 2012 and 2016.

Predictably, shale gas regulations may go too far for the industry and not nearly far enough for environmentalists. As costs and benefits become clearer, with more research, policy tools can better satisfy concerns on both sides. In the meantime, Don Riggenbach is hoping for Wetzel County wells to produce big. The sooner royalties from wells, a share of profits, arrive in area lease-holders' hands, the sooner he'll be selling them new floor and wall coverings. **RF**

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UPFRONT

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months, totaled $1,387 for SNAP customers; credit card sales were $1,835. In the third full year, 2011, SNAP sales were nearly $8,000; credit card sales were $24,075. "Credit and debit is huge," she says.

The Byrd House Market in Richmond, Va., started accepting EBT, credit, and debit cards last year. The market is a project of the William Byrd Community House, an 89-year-old social service organization that has added a small-scale farm to grow produce for its emergency food pantry. Many Byrd House clientele and staff as well as students from nearby Virginia Commonwealth University receive SNAP benefits, says manager Ana Edwards.

Patricia Stansbury of Epic Gardens in Richmond oversees a table loaded with snap beans, onions, arugula, white radishes, and buckets of fresh flowers. "Where's the baby bok choy?" a customer asks. People of all income levels and occupations mingle at the market, which started in 2007, from students to moms stretching a food budget to professional chefs. Shortly after the market opened, a man wearing black trousers and a white chef's jacket had snapped up the baby bok choy. "Sorry," she says. "It's all gone."

— Betty Joyce Nash

Editor's Note: In the Upfront section of our First Quarter 2012 issue, the article "East Coast Ports Prepare for Bigger Ships from the Panama Canal" looks at port expansions to accommodate "post-Panamax" vessels. It should be noted that the Port of Baltimore, a deepwater port at the northern fringe of the Fifth District, is preparing to make way for these large container ships.

When Do Acquisitions Endanger the Financial System?

BY DAVID A. PRICE

In the Dodd-Frank Act of 2010, passed in response to the 2008-09 financial crisis, Congress directed regulators to carry out a "financial stability review" when banks and some other financial institutions seek approval for mergers and acquisitions. Congress did so based on concerns that the crisis had been driven in part by the scale of the largest institutions, and the dependence of the rest of the financial sector on their soundness. The law therefore requires the Fed and other regulatory agencies to consider whether a proposed merger or acquisition would lead to increased systemic risks to the stability of the U.S. financial system. The Fed's approval in February of an acquisition by Capital One Financial Corp., a Fifth District institution, provided some insight into how the Fed will assess those risks.

Capital One, based in McLean, Va., had requested the Fed's approval to acquire ING Bank of Wilmington, Del., which had no branches, but which did business nationally through the Web. Measured by the amount of deposits, Capital One and ING Bank were the eighth-largest and 17th-largest depository institutions in the United States, respectively. After the proposed merger, their combined size would make the resulting enterprise the fifth-largest depository institution in terms of deposits and the 20th largest in terms of assets.

After Capital One submitted its application for approval to the Richmond Fed, the Richmond Fed transferred it to the Board of Governors in Washington, D.C. It did so because the financial stability review was a new requirement and because public interest in the case was high, according to Sabrina Pellerin, bank structure manager at the Richmond Fed. The Board held several public hearings on the application and received hundreds of letters pro and con.

The Dodd-Frank Act added the stability review to an already-existing set of requirements for assessing mergers and acquisitions. In addition to financial stability, the Fed was required to determine, among other factors, whether Capital One's proposed acquisition would have a significantly adverse effect on competition, whether its financial and managerial resources would be adequate for the acquisition, and whether it had a good record of performance under the Community Reinvestment Act. In connection with that review, the Board did not find any basis to disapprove the application, but it did impose conditions related to compliance with fair lending and other consumer protection laws.

With regard to the stability review itself, the Board said it would consider "a variety of metrics." The metrics that it named were the size of the combined firms as a share of the overall size of the U.S. financial system, the availability of substitutes for any "critical" products and services offered by the firms, the interconnectedness of the firms with the rest of the banking or financial system, the extent to which "the resulting firm contributes to the complexity of the financial system," and the extent of its international activities.

But the Board stopped short of specifying numerical limits on these measures that would lead to disapproval, apart from limits already written into federal law (such as the limit of a 10 percent share of nationwide deposits or nationwide liabilities). The Board also stated that it would consider qualitative factors, such as the complexity of the institution's internal organization, that would shed light on the likely difficulty of resolving the institution in case of financial distress. In addition, the Board indicated that its lists of quantitative and qualitative factors were not all-inclusive.

Applying this guidance to Capital One's application, the Board found that although the acquisition would leave it "large on an absolute basis," its assets, liabilities, leverage exposures, and deposits relative to the U.S. financial system as a whole — between 1.1 percent and 2.3 percent, depending on the metric — would be "modest." Because the business of the combined firm would be mainly in traditional retail banking activities that are competitive, the Board determined that the availability of substitutes was not a concern. The Board also found no issues regarding interconnectedness, complexity, or international activities.

The approach described by the Board in the Capital One case, with its reliance on case-by-case judgment, was somewhat in contrast with the approach set out in November by the Basel Committee on Banking Supervision for identifying global systemically important banks. The Basel Committee's framework relies on a series of formulas to arrive at weighted scores that represent a bank's level of systemic importance. The scores can be overridden on the basis of supervisory judgment, but only in "exceptional" cases.

The Board did announce numerical cut-offs in its Capital One decision for one part of its acquisition approval process: It stated that if a proposal involves an acquisition of less than $2 billion in assets, results in a firm with less than $25 billion in assets, or is a reorganization of an existing holding company, then it "may be presumed not to raise financial stability concerns" unless there is evidence to the contrary.

Future acquisition applications referred to the Board may yield more detailed insight into the Board's approach. In an *American Banker* online poll in February, following the Capital One announcement, a plurality of 46 percent of respondents held that "until the Fed actually rejects a deal, it's hard to tell whether the line has shifted." **RF**

Interview

John A. List

In the 1950s, Vernon Smith — then teaching at Purdue University and influenced by the work of Edward Chamberlin, one of his instructors at Harvard University — began conducting experiments to see how people responded to various market incentives and structures in a laboratory-type environment. At first, many economists questioned the importance of those experiments' results. But by the 1970s, others, including Charles Plott of the California Institute of Technology, began using experiments to better understand decisionmaking in various market settings, and in 2002 Smith was awarded the Nobel Prize in economics along with the psychologist Daniel Kahneman of Princeton University.

In the mid-1990s, John List, who believed that experimental work had provided unique insights into human behavior, began conducting experiments of his own, but in the field rather than in the lab. By setting up carefully designed experiments with people performing tasks they are used to doing as part of their daily lives, List has been able to test how people behave in natural settings — and whether that behavior is consistent with economic theory. List's field experiments, like Smith's lab experiments, were initially greeted with skepticism by many economists, but that has changed over time. List has published more than 150 articles in refereed academic journals during the last 15 years, many on field experiments and related work.

List began his career at the University of Central Florida, with stops at the University of Arizona and the University of Maryland before arriving at the University of Chicago in 2005. While at Maryland, List served as a senior economist with the President's Council of Economic Advisers, working largely on environmental and natural resources issues. He is co-editor of the *Journal of Economic Perspectives* and serves on the editorial boards of several other journals. Aaron Steelman interviewed List at his office in Chicago in May 2012.

PHOTOGRAPHY: JASON SMITH/UNIVERSITY OF CHICAGO

RF: Could you briefly describe what you mean when you speak about field experiments in economics — and what methodological issues should economists be concerned with in order to do field experiments well?

List: A good place to start is to think about how economists have used measurement tools in the past. The semi-automatic approach has been to go to your office and write down a model and then go out and look for data. You don't generate your own data, but look for secondary data. After you find mounds and mounds of data, you then overlay assumptions on those data to make causal inference. If you use a propensity score matching model, for example, you invoke a conditional independence assumption. If you use instrumental variables, you have exclusion restrictions. If you use a difference in difference model, you make assumptions about the correlation between the error term and the regressors. So that's the typical approach. The overarching idea is that the world is messy, so we need to write down a model, go gather mounds and mounds of data, empirically model those data, and then try to say something beyond a correlation — try to make a causal statement that's within our theory.

About 50 or 60 years ago, Vernon Smith enters the picture and says that we can learn about economic relationships using laboratory experiments. He starts to run lab experiments in the 1950s, mainly using undergraduate students, and he finds some very interesting results. And this was before many of the measurement tools like instrumental variables had been fully developed. Economics had a very Victorian sensibility at that time. Now the beauty behind experimentation is that you need to make one major assumption to identify the treatment effect of interest, and that's proper randomization. So while the other empirical approaches typically have assumptions that economists view as quite contentious, experimentation has one that can be externally verified.

You can then ask, why don't we all just run lab experiments with students? For me, a first inclination is not to gather data in the lab, but go to the field, though I have always been sympathetic to the laboratory approach. I was hit over the head when I was working in the White House in 2002 and I was arguing that as we revised the cost-benefit guidelines we should take into account Danny Kahneman's, Dick Thaler's, and Jack Knetsch's work that shows students have reference-dependent preferences in the lab. Unfortunately, no one at the White House took me too seriously. So when Glenn Harrison and I wrote the paper for the *Journal of Economic Literature* in 2004 on field experiments, our first thought was: What is the first step outside a typical lab experiment with student subjects that would still have the environment of the lab but would capture better the idea of a representative population? And that's what we call an artefactual field experiment. The first step is not to really go outside the lab, but it's to go and collect data from a group of experts — farmers, CEOs, members of the Chicago Board of Trade, whomever is of interest — and run those people through a typical laboratory exercise. The field element is the person in this case. You could say, well, you have now dealt with the issue of representativeness, but it's still a very sterile and artificial environment when we gather lab data.

So the next step that Harrison and I talk about is what we denote as a framed field experiment. And what that means is that we slowly add naturalness to the environment by asking subjects to perform a task that they are used to performing, using the same stakes that they typically use in their everyday lives. It's having them do things that they normally do, but they still know that they're taking part in an experiment.

The last step in this process is to have randomization and realism. And that's what we call a natural field experiment. In this type of data-generating exercise, I now have what the naturally occurring data has, which is realism — that is, I observe people behaving in the markets in which we want to study. And then I use randomization to identify my treatment effect. We essentially have our cake and can eat it too with natural field experiments.

Beyond having the power to measure important treatment effects, the point of all these levels of field experiments was to see if ideas like reference-dependent preferences dictated behavior as strongly in everyday life as the lab evidence seemed to suggest.

RF: Could you give an example of how this is done?

List: A real problem with artefactual and frame field experiments is that it's possible that the act of experimentation is influencing the participants' behavior. So let's go through an example whereby I think I can convince you that I am in a natural environment and that I'm learning something of importance for economics. I first got interested in charitable fundraising in 1998 when a dean at the University of Central Florida asked me to raise money for a center at UCF. I went out and talked to dozens of fundraising practitioners and experts, and they had several long-held beliefs about such things as the benefits of seed money and of using matching funds. Many charities have programs where they will match a donor's gift. So your $100 gift means that the charity will get $200 after the match.

Interestingly, however, when you go and ask those charities if matching works they say, "Of course it does, and a 2-to-1 match is much better than a 1-to-1 match, and a 3-to-1 match is better than either of them." So I asked, "What is your empirical evidence for that?" They had none. Turns out that it was a gut feeling they had.

I said, well, why don't you do field experiments to learn about what works for charity? Let's say the typical way in which a charity asks for money is a mail solicitation. So what we are going to do is partner with them in one of their mail solicitations. Say they send out 50,000 letters a month. We will then randomize those 50,000 letters that go directly to households into different treatments. One household might receive a letter that says, "Please give to our charity. Every dollar you give will be matched with $3 from us." Another household might receive the exact same letter, but the only thing that changes is that we tell them that every dollar you give will be matched by $2. Another household receives a $1 match offer. And, finally, another household will receive a letter that doesn't mention matching. So you fill these treatment cells with thousands of households that don't know they're part of an experiment. We're using randomization to learn about whether the match works. That's an example of a natural field experiment — completed in a natural environment and the task is commonplace.

I didn't learn that 3-to-1 works better than 2-to-1 or 1-to-1. Empirically, what happens is, the match in and of itself works really well. We raise about 20 percent more money when there is a match available. But, the 3-to-1, 2-to-1, and 1-to-1 matches work about the same.

RF: How does charitable giving in the United States compare to other countries? And what do you think are some of the reasons that may explain these differences?

List: I have co-written with Michael Price a recent paper titled "Charitable Giving Around the World" and something that we bumped up against right away is that it's hard to find good, comparable data around the world. So, with that caveat in place, two stylized facts jump out. One is that people in the United States give at extraordinary rates. We give roughly 3 percent of GDP every year. And that represents individual gifts — that doesn't include corporations. When you compare the United States to other developed countries, the U.S. is well above other developed countries. However, when you look at volunteerism, the U.S. is well below other countries. So we give a lot more money, but we volunteer our time much less often than citizens in other countries.

So as an economist I ask, what are the economic reasons for these patterns? What you observe in other countries is that governments tend to provide a lot more public goods. In Europe, for example, their marginal tax rates tend to be well above ours because they provide more public services or public goods. When you talk to folks from Europe, what they tell you is, "I don't need to give to that particular cause, because the government already provides it." If you look at U.S. history, functions such as helping the poor have varied over time — during some periods helping the poor was spearheaded by the government; in others, private organizations did the bulk of the work. So a lot of charitable organizations were formed and still are active in that space. That said, in many European countries more individuals are increasingly willing to give money as, say, public funds for universities are being cut. I receive phone calls all the time from European universities that are considering approaching their alumni for donations.

I think economic differences — levels of taxation, the provision of public goods — can explain a lot of the differences across countries. I think culture also has a lot to do with it as well, even though "culture" is sort of the catch-all term that can explain just about everything. Still, it's true that we have a culture of giving money in the U.S., while in other countries they have a culture of giving time. And if you see that your parents generally give money rather than time, or vice versa, you tend to do the same thing.

RF: Are there certain types of issues that have features which make them particularly well suited to field experiment work? And are there some areas that you think field experiments would yield little to our understanding of those issues?

List: Let's start with the types of issues we might exclude. I think that a lot of macro policies, like the effect of interest rates on the macroeconomy, fit into that category. It's hard for me to envision that when you have a policy that affects the entire nation at once, like a change in interest rates, you could effectively think about a field experiment that could give you great insights. And the reason why is because you don't have the proper counterfactual. If you could randomize different states into different interest rate environments and people couldn't lend across state lines, then you could maybe get somewhere with a question like that. But when you don't have the proper counterfactual, it's really hard to envision a field experiment lending many insights. So I think there are a lot of questions in which the field experimental method is not the best approach. It is just impractical for many important economic questions.

But there are other questions where field experiments could be very useful. How much discrimination is present in a market and what is the nature of that discrimination? Why do people give to charitable causes and what keeps them committed to the cause? Are prospect theory preferences important in markets and can those with market experience overcome those biases, or do people learn to have behavioral biases? What education reforms can work most cost effectively? What are the best ways to reduce the racial achievement gap? What public policies can work to lower teen criminal activity? All of these questions and many others are fair game using the field experimental method. Further, I believe that field experiments are the best approach, to, first of all, find out whether there's a causal relationship between variables of interest, and then also determine the underlying channels for that relationship. I think field experiments, better than any other approach, can measure whether it's occurring and tell you why it's occurring.

For instance, it's really hard to look at mounds and mounds of data and determine why one person is discriminating against another in a market. Economists have two major theories. One is Gary Becker's taste-based discrimination — people discriminate because they have a taste for discrimination; for example, because they don't like that certain person or group, they are willing to forgo profits to cater their prejudice. Years before that, Arthur Pigou discussed third-degree price discrimination — entrepreneurs, in their pursuit of profit, will discriminate. With mounds and mounds of data, it would be very hard for you to parse those two models. But if you have the correct field experimental treatments, you cannot only measure if discrimination exists, but you can decipher which of those models is at work. I did this in my 2004 *QJE* paper on discrimination and in more recent work across several markets with Uri Gneezy and Michael Price.

RF: Why do you think economists have largely been opposed to methodological approaches such as field experiments and do you believe that is beginning to change?

List: First of all, when economists started using experimentation it was in the lab. And I think many people in the profession were already skeptical of what we can learn from laboratory exercises because they were already tainted by their distrust of psychology experiments. So I come along, and I say we really need to use the tool of randomization, but we need to use it in the field. Here's where the skepticism arose using that approach: People would say, "You can't do that, because the world is really, really messy, and there are a lot of things that you don't observe or control. When you go to the marketplace, there are a lot of reasons why people are behaving in the manner in which they behave. So there's no way — you don't have the control — to run an experiment in that environment and learn something useful. The best you can do is to just observe and take from that observation something of potential interest."

That reasoning stems from the natural sciences. Consider the example with the chemist: If she has dirty test tubes her data are flawed. The rub is that chemists do not use randomization to measure treatment effects. When you do, you can balance the unobservables — the "dirt" — and make clean inference. As such, I think that economists' reasoning on field experiments has been flawed for decades, and I believe it is an important reason why people have not used field experiments until the last 10 or 15 years. They have believed that because the world is really messy, you can't have control in the same way that a chemist has control or a biologist might have control.

That's what people often think about — the scientific method. In physics, we have vacuum tubes; in chemistry we have very clean test tubes. If you don't have a very clean test tube, then you can't experiment as the theory goes. And I think people have generalized incorrectly, and here's why: When I look at the real world, I want it to be messy. I want there to be many, many variables that we don't observe and I want those variables to frustrate inference. The reason why the field experiments are so valuable is because you randomize people into treatment and control, and those unobservable variables are then balanced. I'm not getting rid of the unobservables — you can never get rid of unobservables — but I can balance them across treatment and control cells. Experimentation should be used in environments that are messy; and I think the profession has had it exactly backwards for decades. They have always thought if the test tube is not clean, then you can't experiment. That's exactly wrong. When the test tube is dirty, it means that it's harder to make proper causal inference by using our typical empirical approaches that model mounds and mounds of data.

So I think there are two main reasons. People have traditionally thought of experimentation through the lens of the lab, and they have not liked that because of perceived problems of representativeness of the population or representativeness of the situation. And secondly, they have flawed thinking about how you identify your treatment effect with your field experiment.

RF: Under which conditions does prospect theory seem to explain behavior that cannot seemingly be explained by conventional neoclassical models?

List: I think a general statement about behavioral economics would be as follows: If I want to take a trip from Chicago to Fenway Park — say I want to go watch the Red Sox play the Yankees — neoclassical theory will get me to Cambridge. But I need behavioral economics to get me from Cambridge to my seat in the 25th row of Fenway Park. And what that means is that I think behavioral economics is important to explain behavior at the individual level, but if we want to get into the vicinity of the correct answer, neoclassical economics can get us there. And then around the margin, behavioral economics does really well at pinpointing and helping us refine that answer.

I think prospect theory is a perfect example of a behavioral manifestation that is important. One of the most important elements within prospect theory is something called loss aversion — people value a one unit loss much more than a one unit gain. How do you leverage that insight? We have done so in several places. One example is that we — Tanjim Hossain and I — have gone to manufacturing plants in China and they have asked us what are the best ways to incentivize their workers to work hard. What we typically do is we give them a few dollars more if they produce at higher levels, and we tell them this is a conditional bonus. We first give them the money and then say, if you do not achieve that goal, we will take that money away from you. We find that just by framing, we can increase productivity by 1 percent. And that occurred for more than just a few hours; that occurred for six months.

You can say, well, does that work in other walks of life? What's been really hard in the area of education is to use incentives to get teachers to try harder. So teachers will say, "Look, I try as hard as I can already." And we have incentive schemes that have been tried in the United States that don't seem to work very well. These incentive schemes tend to be structured something like this: In September we tell you, if your students do a lot better than everyone else's students, then you are going to receive $4,000 in the spring. What we have found is that doesn't really work very well. But if we give them the $4,000 in the fall and tell them we will take that money away in the spring if your students do not achieve, they will perform remarkably better. And one explanation consistent with such behavior is loss aversion.

It also works for students. For example, we have compared two groups. First, we have gone into the testing room the morning of a test and said, here's $20 and if you improve your test scores from last fall, you can keep the $20, but if you don't improve, we will take it away. Second, we have told a different group of students that they will receive $20 after

John A. List

➤ Present Position

Homer J. Livingstone Professor of Economics, University of Chicago

➤ Previous Faculty Appointments

University of Maryland (2001-2005), University of Arizona (2000-2001), and University of Central Florida (1996-2000)

➤ Education

B.S., University of Wisconsin-Stevens Point (1992); Ph.D., University of Wyoming (1996)

➤ Selected Publications

Author of numerous articles in such journals as the *American Economic Review*, *Journal of Political Economy*, *Quarterly Journal of Economics*, *Econometrica*, *Journal of Public Economics*, and *Science* the fact if they improve their scores. The first group performs much better than the second. And I think this is because people do have an aversion to losing something.

You can say, OK, how does that affect markets? And that's what I have thought hard about. As I found in my 2003 *QJE* piece on prospect theory, if you go to a market that has active traders, what you find is that the inexperienced people trade as though they have loss aversion but the really experienced ones don't. And then you ask yourself, well, is that because of selection or treatment? Maybe some of us are born with prospect theory preferences, while some of us are not. Or is it that the market has taught the experienced traders? Is it that the people who survive don't have prospect theory preferences, and if they have them, then they don't survive in the market? Now you can test that because you can randomly give people experience. How I have done that in a recently published piece in the *American Economic Review* is by giving some people free goods and telling them to go off and trade them and you incentivize them to trade; in the control group, you don't give free goods and you don't incentivize them to trade. And you look via experimentation whether the first group exhibits prospect theory preferences after six months versus the second group. What happens is that the market does weed out those people who have real biases, but people do learn. So the act of trading induces people to learn to overcome their prospect theory preferences.

In the end, is the market price determined by people who have prospect theory preferences? No. I think behavioral economics in this form is important to get people to do things you want them to do, but in determining prices and allocations in more mature markets, there is not strong evidence that such preferences importantly influence prices.

RF: To what extent do additional entrants in the certification market tend to improve information provided to consumers — and which consumers tend to benefit most from additional firms entering that market?

List: Product certification is used in many markets. And you can ask yourself, well, is product certification important, does it improve the welfare of people, does it improve information in the market? When you think about how you answer these types of questions, it seems like a field experiment is a really good approach to lend initial insights. That's what co-authors at the University of Maryland and I did when we researched in this area when I was a professor at Maryland. We looked at the market for sports cards and what you see is that before 1987, there was no third-party certifier in that market. In 1987 a company called Professional Sports Authenticator (PSA) enters. They start informing sports card buyers, sellers, and dealers the quality of their sports cards. Is it authentic, for example? Does it have sharp corners? Does it have good centering? And what they essentially did was develop a scheme that was very coarse. They gave a card an integer grade of 1 to 10, and what you find is that the information they provided is useless to those really experienced in the sports card markets. Sports card people who already had experience — the dealers — already knew the information that PSA provided.

But those really inexperienced consumers received a wealth of information from that ranking scheme. So when you think about a market that begins to evolve and when you have a monopolist certifier, it will provide information to the market, but only a certain type of individual will benefit from that information.

So then we observe behavior from 1987 to 1999, and now two more sports card graders enter the market — Sportscard Guaranty (SGC) and Beckett Grading Service (BGS). What these two firms do to secure market share is to offer a more differentiated product. Now your card can receive a 7.5 instead of just a 7 or 8, which is what PSA offered, and now that information, in its more detailed form, is adding insights to even the most experienced people. As a whole, that increases welfare. And since then the market has become even more developed, with many other firms entering. So you see this great evolution of a private certification market, and because we can overlay a field experiment on it we can then measure the welfare implications of that evolution.

RF: One of the things that you mentioned in your 2011 *Journal of Economic Perspectives* paper, "Why Economists Should Conduct Field Experiments and 14 Tips for Pulling One Off," is that it's important to do field experiments about things that you know well. This seems like a good example.

List: Absolutely. I started as a sports card dealer back in high school in the mid-1980s. I didn't really see it then, but I was actually running field experiments, because I would start off the bargaining process differently depending on the characteristics of the potential buyer — whether the buyer was male or female, young or old, for instance. In a way I had experimented already with bargaining propensities without knowing it. And then I arrive at the University of Wyoming as a graduate student in the early 1990s and I learn that there's this emerging literature on laboratory experiments. So I thought, well, why don't we study this market using field experiments? And when I tried to sell that to my professors at Wyoming no one was interested at first. I said, I know economic theory, and I know the sports card market very well. How about if I use that as my laboratory? I never really imagined that we would care about sports cards in and of themselves — it's too small of a market. But it also seemed like a market that was well suited to these types of experiments because I knew it well, and the broader behaviors that I was trying to learn about should be generalizable to more important markets.

So I ended up starting to run my first scientific field experiments in Denver in the early 1990s for my dissertation and for future work. I always thought that the main advantage I had was that I knew my laboratory well — by knowing how the market functioned, I could implement various treatments with confidence that my interpretation of the data was correct. For example, I could run a certain kind of auction and everyone would find that to be natural. I knew I could approach dealers and bargain in a way that they would think there's nothing unusual happening. I knew that there were aspects of this market that could tell me things about loss aversion, about discrimination, about product certification, about bargaining, and about many other issues economists found interesting. I don't think I could have done that had I not understood the market — the motives and the values and the preferences of the participants — as well as I did.

I think that's one of the two main features that you must have before you actually go out and run field experiments: You really need to understand the market so you know what you are testing and you know how to test it in a natural way. I think the other main feature is that you always need economic theory as a guide. You are setting up your experiment based on economic theory and also to test economic theory. Theory provides a framework to help design the experiments, and the experimental results give you a view of the theory that you could never have without randomization. In this way, the theory is a lens into not only the data but also the world at large.

RF: Your paper with Roland Fryer and Steven Levitt came to a somewhat ambiguous conclusion about whether stereotype threat exists. But do you have a hunch regarding the answer to that question based on the results of your experiment?

List: I believe in priming. Psychologists have shown us the power of priming, and stereotype threat is an interesting type of priming. Claude Steele, a psychologist at Stanford, popularized the term stereotype threat. He had people taking a math exam, for example, jot down whether they were male or female on top of their exams, and he found that when you wrote down that you were female, you performed less well than if you did not write down that you were female. They call this the stereotype threat. My first instinct was that effect probably does happen, but you could use incentives to make it go away. And what I mean by that is, if the test is important enough or if you overlaid monetary incentives on that test, then the stereotype threat would largely disappear, or become economically irrelevant.

So we designed the experiment to test that, and we found that we could not even induce stereotype threat. We did everything we could to try to get it. We announced to them, "Women do not perform as well as men on this test and we want you now to put your gender on the top of the test." And other social scientists would say, that's crazy — if you do that, you will get stereotype threat every time. But we still didn't get it.

What that led me to believe is that, while I think that priming works, I think that stereotype threat has a lot of important boundaries that severely limit its generalizability. I think what has happened is, a few people found this result early on and now there's publication bias. But when you talk behind the scenes to people in the profession, they have a hard time finding it. So what do they do in that case? A lot of people just shelve that experiment; they say it must be wrong because there are 10 papers in the literature that find it. Well, if there have been 200 studies that try to find it, 10 should find it, right? This is a Type II error but people still believe in the theory of stereotype threat. I think that there are a lot of reasons why it does not occur. So while I believe in priming, I am not convinced that stereotype threat is important.

RF: That raises a related question: How strong do you think publication bias is in the economics profession?

List: It's really hard to publish a paper that goes against the mainstream way of thinking. And I just think about some of my own experiences, such as the prospect theory paper I mentioned before, which was published in the *QJE* in 2003. The paper, when it started, was a very short exercise showing the power of market experience and because people did not believe it, I had to continue to do new experiments — new field tests — and eventually this paper consumed my life for years and ended up being a 30-page paper. Was it a much stronger contribution? Absolutely, the editorial and review process really helped a lot. But the main message was always contained in a paper that could have been 10 pages. To overturn the mainstream way of thinking, however, you have to go above and beyond. And that's often hard to do because the burden of proof is on you.

That said, could I tell you right now what are the five things that I think the profession has wrong? I couldn't, because I think the profession has most things right. It might not have all the details right, but I believe most of the first-order thinking is right.

I think in many ways, it's harder to overturn entrenched thinking in parts of the nonprofit, corporate, and public sectors, where many things are not subject to empirical testing. For instance, why don't we know what works in education? It's because we have not used field experiments across school districts. Each school district should be engaged in several experiments a year, and then in the end the federal government can say, "Here's what works. Here's a new law." It's unfair to future generations to pass along zero information on what policies can curb criminal activities, what policies can curb teen pregnancy, what are the best ways to overcome the racial achievement gap, why there aren't more women in the top echelon of corporations. We don't know because we don't understand, we haven't engaged in feedback-maximization. There needs to be a transformation, and I don't know what it's going to take. I mean, are we going to be sitting here in 50 years and thinking, "If we only knew what worked to help close the achievement gap, if we only knew how to do that"?

I hope my work in education induces a sea change in the way we think about how to construct curricula. Right now, we are doing a lot of work on a prekindergarten program in Chicago Heights and in a year or two I think that we will be able to tell policymakers what will help kids — and how much it will help them. But unless people adopt the field experimental approach more broadly, it will be a career that's not fulfilled in my eyes.

RF: Do you think the market for placement of new economists works relatively well? I am interested in both your empirical work on this topic as well as what you believe you have learned from your own experience.

List: My personal experience is sort of a checkered one. When I graduated from the University of Wyoming in 1996 I applied for 150 academic jobs. The ASSA meetings that year were in San Francisco. So I flew to San Francisco from Laramie, and I'm beaten down. I applied to 150 schools and only two schools agreed to interview me at the meetings. One was the University of Central Florida and one was Montana State University-Billings. So at that point I didn't think the market worked very well, because I thought I was a reasonable economist and I should receive more attention. But the majority of economists obviously did not agree with me. I was really lucky that I ended up securing a job at the University of Central Florida, because I'm not sure really what would have happened otherwise. My dad is a truck driver and maybe I would have gone back to Wisconsin and ended up driving trucks. Luckily enough, I did get an academic job that year.

I continued to do field experiments at Central Florida. Vernon Smith noticed some of my work and I ended up moving to the University of Arizona in 2000. Unfortunately, when I arrived at Arizona, Vernon told me that he was having problems with the administration and that the entire experimental group was moving. He wasn't sure where. At the time he was talking to Purdue and Caltech. He ended up going to George Mason. That winter, some people at the University of Maryland had read a few of my papers on field experiments and I had a little bit of luck in placing them at top journals, so they called me. I ended up moving there, which is close to George Mason and allowed me to continue doing some work with Vernon's group.

I then had a really good publication year in 2004, and the profession started to recognize that I'm writing these papers that could be paving a new way to think about empirical economics using field experiments. And that's when I moved to Chicago and I've been here since 2005.

So in my case you would say the market worked pretty well. I was coming from a school that was not highly ranked, so not many schools were interested in me. In fact, if I had sent my application to Chicago in 1995, I'm sure that they would not have even opened the envelope because it said the University of Wyoming on the cover and that would have been viewed as a bad signal. I think I got more or less what I deserved; I got what the market said I should get. What would have been a sign that the market did not work would be if I were still at the University of Central Florida with the exact same number of publications and the exact same number of projects going on and Chicago still said no because I graduated from the University of Wyoming.

Now, my own experience got me interested in how this market actually operates. So I started to do survey work and field experiments on what determines a person's success in this market. What do people look at when they hire Ph.D.s for the first time? And that's when I started writing these articles about what it takes to get an academic interview or government interview or business interview, because I was so fascinated and disappointed by my own experience. What I found in that work were kind of the typical things: It hurt me not coming from a top 5, top 10, or top 20 school; it hurt me that I did not have a well-known, Nobel-type economist writing letters for me; and perhaps what hurt me the most is that I didn't have much published research at the time. But the silver lining is that in the end if you work hard, you can increase your stock and you can move up. I have aged a lot in this process. It's been many years of sleepless nights working on research. I have loved every minute of it, though.

RF: Do you think your experience is typical in the respect that you have to make several moves, some of which might be considered lateral, before arriving at what might seem like the appropriately matched institution or department?

List: I do often wonder, did I really have to move three times to get to Chicago, or could I have just waited and moved directly here in 2005 or maybe a little earlier from Central Florida? There is not a lot of evidence on that; there are some stylized facts. Something like 90 or 95 percent of people secure their first jobs at departments that are lower ranked than the departments that they graduated from. This is because the top schools graduate many more people than they can hire. And then where you get tenure is typically at a department ranked lower than where you got your first job.

RF: Which economists have been the most influential in shaping your thinking about economic policy issues and how those issues should be addressed?

List: Vernon Smith and Gary Becker, but for different reasons. Vernon because he got me interested in generating your own data and framing questions in the appropriate ways. Gary because he showed me the importance of having a disciplined way to think about the problem and understanding that standard neoclassical economics can go a long way in explaining, or helping us to explain, major problems. I think above all else, those two traits have shaped the way I think about policy problems and economics more generally. **RF**

The Voyage to Containerization

BY BETTY JOYCE NASH

How a North Carolina trucker freed world trade

Every seven minutes, a crane at Port Newark in New Jersey lowered a large metal container — an aluminum truck body — until it rested on the deck of an old tanker ship, christened the *Ideal-X* because it was ideal for the experiment. It was April 26, 1956.

Five days later, the *Ideal-X* arrived in Houston, where cranes hefted 58 containers onto 58 trucks that hauled the big boxes to their destinations. The voyage to containerization, and to a revolution in global trade, had begun.

The man behind the operation, Malcom McLean, cared mostly about the math. Cargo in that era typically took a week's worth of human labor to load and another week to unload, at a cost of $5.83 a ton. But McLean's experts figured the *Ideal-X*'s loading costs at 15.8 cents a ton, according to historian and economist Marc Levinson, author of *The Box*, a history of container shipping.

McLean's big idea was to handle cargo only twice, once at the shippers' location and again at the final destination, never opening the box in transit. "That really cut out a lot of dockworkers," says Wayne Talley, a professor of maritime economics at Old Dominion University. It also cut waste, damage, and pilfering, which lowered insurance. "The moving of general cargo became less labor intensive and more capital intensive. It was a major technological advancement, this simple idea of handling cargo twice." Ultimately, this slashed shipping costs, which made it affordable to haul goods over distances unimaginable at the time.

McLean was an outsider to the maritime industry. A ship to him might as well have been a truck on water. He'd already built one freight-hauling empire on land; why not build another, at sea?

Malcom McLean stands at the Port Elizabeth, N.J., terminal of Sea-Land, the container shipping company he founded. A native North Carolinian, McLean's instinct for efficiency had helped him build a successful trucking firm before he entered the shipping business. His big idea was to handle cargo twice and twice only, which led to lower shipping costs.

PHOTOGRAPHY: A.P. MOLLER-MAERSK

Four Lanes to Sea Lanes

McLean worked in the early 1930s at a gas station where he heard truckers got five dollars for hauling the station's oil from Fayetteville, 28 miles away. It sounded like good money, so he borrowed the station owner's rusted-out trailer to do the job. By 1940, he had 30 trucks on the road and was grossing $230,000 a year. Five years later, his fleet had grown more than fivefold.

Trucking boomed. Long-distance truck traffic more than doubled between 1946 and 1950, according to Levinson. McLean expanded by leasing routes or buying companies. He grew his truck fleet in part by recruiting World War II veterans who could use government loans to buy their trucks, then work for him as independents. Between 1946 and 1954, McLean Trucking routed goods from Atlanta to Boston.

McLean watched every expenditure. McLean Trucking installed diesel instead of gasoline engines. Operators bought only at gas stations agreeing to discount fuel. The Winston-Salem, N.C., hub automated and transferred freight between trucks by conveyor belts. The firm paired new drivers with experienced ones, who received bonuses if a trainee went accident-free the first year. This cut insurance and repair costs.

To add routes, McLean had to deal with federal regulations that controlled routes, rates, and even the types of goods hauled. The Interstate Commerce Commission (ICC) required proof that rates were neither too high nor too low. McLean mastered the art of showing that his proposed lower rates would turn a profit on a route that he wanted. For instance, he convinced the ICC that his administrative, marketing, and terminal costs were lower for cigarettes than other products; that enabled him to haul cigarettes from Durham, N.C., to Atlanta at half the rate other truck lines charged. By 1954, McLean Trucking ranked third in after-tax profits of all U.S. trucking firms, according to Levinson.

As road conditions and traffic worsened, McLean worried about possible competition from coastal ship operators, whose low rates had been subsidized since the Merchant Marine Act of 1936. Coastal operators also could buy surplus wartime cargo ships for next to nothing, which tempted McLean. (McLean opted against subsidies when he entered shipping, says Chuck Raymond, who worked at McLean's firm, Sea-Land Service, from 1965 until its owner CSX sold it to Maersk in 1999. McLean thought people worked better and harder without the cushion. He also wanted to avoid another layer of federal interference.)

Though container shipping seemed poised for success, many thought it impractical, a passing fad. The prospect of automation also created labor strife.

McLean acted to head off this potential competition from cargo ships. Why not haul truck trailers via ship, unloading at trucking hubs? By 1953, he'd located a terminal. Later, he took one of McLean Trucking's top salesmen, Paul Richardson, to a New Jersey pier and showed him a container-loaded ship, according to Richardson's oral history transcript. "He said to me, 'Paul, did you ever see one tractor pulling 226 trailers?' I said, 'No sir.' And he said, 'There's one right there.'" Richardson was to become Sea-Land's national sales manager and eventually its president.

McLean's instincts matched his imagination. "He had a huge ability to visualize how things could be done better," Raymond says, "and had the guts to try it."

Rocking the Boat

McLean grasped that the choke point of the transportation business was where the modes of transport come together, recalled one of Sea-Land's chief naval architects, Charles Cushing, in an oral history. Once that could be automated, then shipping costs would fall.

Cargo in that era appeared dockside either as bulk, commodities like grain, or as breakbulk, separate goods of all shapes and sizes. Everything from bananas to whiskey to fine china showed up in bags, barrels, or boxes. Longshore labor handled the goods, some of which required crates, that members of the cooper's union built. Each job required its own tradesmen.

"There were thousands of people out on these piers," Cushing remembered. "The longshoremen would come down and there would be gangs in every hold. And there were hordes of people working on these piers to move a very modest amount of cargo. And it was just horrible ... logistically, industrially, in every possible way."

And expensive. Freight costs in 1961 were 12 percent of the value of U.S. exports and 10 percent of U.S. import value, according to Levinson — in effect, a trade barrier. Most of the costs lay in transferring loads.

McLean bought his way into coastal shipping with the purchase of the Pan-Atlantic Steamship Corp. But the ICC ruled against the transaction after protests from railroad firms until McLean sold the trucking company.

Although McLean had first envisioned trucks rolling trailers on and off ships, he soon realized that wheels, beds, and axles would consume precious space. Trailers instead could be stacked. Using old tankers minimized risk because they could carry oil on return trips.

But in those early days, proper equipment had yet to be designed or tested. McLean hired an engineer, Keith Tantlinger, and flew him to Mobile, Ala., home of Pan-Atlantic. According to Cushing, "Tantlinger was the mechanical genius in house, devising cell guides and devices for flipping containers down." He invented corner fittings into which a specially designed lock could slide. Containers could be stacked and locked to those underneath. Cranes latched onto the fittings to hoist the big boxes. These inventions may have hastened industry modernization because McLean relinquished the patents in the early 1960s, at Tantlinger's urging.

The aluminum container's roof, though only one thirty-second of an inch thick, would support a man jumping on it because of the way it was riveted, Tantlinger promised. On delivery day, McLean, shipyard officials, and Tantlinger scheduled breakfast together. No one showed but Tantlinger, according to Arthur Donovan and Joseph Bonney in their book *The Box that Changed the World*. (Donovan is a professor emeritus of humanities at the U.S. Merchant Marine Academy; Bonney is transportation finance and economics editor at the *Journal of Commerce*.) When Tantlinger finally headed to the shipyard, he found McLean and the others atop container roofs, jumping.

McLean Industries was not the only maritime shipping firm testing the waters of container transport at the time, but few carried container-only loads. Trailer Marine Transport used wartime surplus landing craft to carry truck trailers from Florida to Puerto Rico; Seatrain had ferried railcars to Cuba since the 1920s. Another firm, Matson Navigation, in contrast to McLean's relatively free-wheeling approach, had cautiously begun researching standardized loads by 1956, but did not convey its first fully loaded container ship between Los Angeles and Oakland, Calif., and Honolulu, until 1960.

During the fall of 1956, McLean used idle time during an East Coast dockworkers' strike to widen decks and expand hatches of surplus wartime freighters to add to his fleet. These ships would carry 226 containers, each 35 feet long, by the following year, about four times the number the *Ideal-X* had carried in 1956. No one knew how a stack of containers might sway or shift or even whether the containers could be crushed. Before the first trip, Tantlinger stuffed chunks of modeling clay into the cell corners to indicate how the loads had moved. Upon the ship's return, the clay in the corners had moved no more than five-sixteenths of an inch, demonstrating the stacks' stability.

Though container shipping seemed poised for success, many thought it impractical, a passing fad. The prospect of automation also created labor strife. Port authorities, too, were divided about whether to configure facilities to accommodate large-scale container shipping or rely on traditional "finger" piers that jutted into the water. In 1962, containers accounted for a mere 8 percent of the freight at the Port of New York and 2 percent of West Coast freight. From 1957 through 1960, slack demand hurt Sea-Land's container business, and it lost $8 million, according to Levinson.

McLean borrowed to buy more surplus tankers; these ships could haul 476 containers, eight times as many as the *Ideal-X* had carried on that first voyage. Richardson developed detailed cost comparisons among modes — truck, ship, and train — to show shippers annual savings.

Once shippers tried the service, they were sold on the container concept. Cushing noted, "Here is one guy taking it [cargo] off your hands with one document, and then it's gonna show up at your consignee, by the way, faster, sooner, with less cost ..."

Sea-Land Service, as McLean's Pan-Atlantic had been re-christened, established California routes, and so became the first carrier to haul goods on both the Pacific and Atlantic coasts. Sea-Land snapped up two ships from a bankrupt former competitor in Puerto Rico; the commonwealth was a lucrative shipping market, partly on account of tax incentives that lured labor-intensive manufacturers. Now the primary carrier, Sea-Land built two new terminals in San Juan and opened routes to two additional Puerto Rican ports.

Chuck Raymond today is a transportation consultant for private equity firms. He saw his first Sea-Land ship in Puerto Rico in 1964 during his "sea year" with the U.S. Merchant Marine Academy at Kings Point, N.Y.

"I saw this ugly, ugly ship come in with containers stacked up on deck, with wings out to each side — those were the cranes. Then the next day, I saw that ship going out," he remembers, told in a telephone interview. He was incredulous. "I was used to a ship taking six or seven days to unload." Right away he sought the name of the company — Sea-Land. "I wrote him [McLean] a letter and said I wanted to work for him."

On the day of his interview, a driver pulled up to the limo stop at the Newark, N.J., airport, as arranged. "A fellow rolled down the window and said, 'Are you Chuck Raymond from King's Point? Hop in the car; I'm taking you over to Sea-Land.'"

The driver quizzed Raymond about his background, how and why he chose the U.S. Merchant Marine Academy, and why Sea-Land interested him. "When we pulled up in the parking lot, they waved this guy through, and then we pulled into a spot with a sign that read M. P. McLean." The trip was on his regular route to work, McLean explained, and it would save taxi fare.

"Here was a guy who was already an icon in the industry," Raymond says. "And he was trying to save a nickel."

Making Money, Losing Money

Always seeking opportunities, in 1966 McLean offered a package shipping deal — containers, chassis, trucks, and terminals — at a fixed price per ton to the military in Vietnam, according to Levinson, in an effort to bring order to a supply chain that was in chaos, logistically. McLean was convinced that containerization could solve the problem. "Like everything else Malcom McLean did," according to Levinson, "venturing into Vietnam entailed considerable risk in hopes of a large reward."

It paid off. On each round trip from the West Coast to Cam Ranh Bay, Sea-Land made more than $20,000 per day. McLean also wanted to make the return voyage pay — with goods from Japan. By 1968, Sea-Land had started its Yokohama-to-California run, its ships loaded with Japanese-made electronics.

But McLean was never short on dreams. Now he wanted a fleet of big, fast ships that could circumnavigate the globe in 56 days. No idle fantasy, such ships could furnish the company a competitive advantage after the Suez Canal closed during the 1967 Arab-Israeli War. Sea-Land's biggest competitor on the North Atlantic was U.S. Lines, with ships that could carry about 1,200 containers, yet still travel at 22 knots, 50 percent faster than any in Sea-Land's fleet.

To help pay for Sea-Land's new SL-7s, in 1969, R.J. Reynolds Industries, of McLean Trucking's hometown of Winston-Salem, N.C., bought Sea-Land.

The timing couldn't have been worse for these fuel-hungry ships. "We built the SL-7s and set transatlantic speed records several times," Raymond remembers. But oil prices started their steep climb in 1973. "It cost a quarter of a million to run those ships one way." And in 1975, the Suez Canal reopened, unexpectedly soon, eliminating any speed advantage. Reynolds took a $150 million loss on the SL-7s, and sold them in 1980 to the U.S. Navy.

McLean left the day-to-day management of Sea-Land in 1970, started selling his stock in 1975, and departed Reynolds' board in 1977, "unhappy with Reynolds' bureaucratic ways," according to Levinson. The tobacco conglomerate had criticized Sea-Land's operations from the start and tightened the reins. After going through the books, according to its chief naval architect at that time, John Boylston, the Sea-Land managers were brought into a meeting where the Reynolds people "chewed us out for a good hour" over sloppy accounting. "They said we'd technically been out of business two or three times in those first six or seven years and simply hadn't known it."

But Sea-Land's entrepreneurial culture kept the company nimble, Boylston remembers. Decisions could be made quickly and sometimes deals were sealed with a handshake. "If you didn't take advantage of the growth opportunities, then somebody else was going to do it very quickly."

McLean worked up other ventures — a hog farm in North Carolina, a residential development named Diamondhead on the Mississippi Gulf Coast — but couldn't stay out of moving freight. A year after resigning as an RJR director, he bought U.S. Lines for $160 million. This time McLean planned bigger but slower ships that could carry more freight in an effort to cut per-unit costs. But by 1985, crude oil prices had dropped from about $30 a barrel to about $10 per barrel, erasing much of the ships' advantage. Overcapacity, meanwhile, brought rate wars on some routes; U.S. Lines went bankrupt in 1986. Sea-Land, which had been acquired by CSX Corp., bought the ships. Charlotte-based Horizon Lines still operates Sea-Land's domestic routes.

McLean died in 2001. Today, ships and containers continue to super-size; ships can barely fit through the Panama Canal, which is undergoing expansion. And intermodal shipping, where freight is loaded from ships to double-stacked trains and trucks, is commonplace.

The containers killed a way of life, in which jobs often were passed from father to son. Worldwide, 70 percent of dockworkers lost cargo-handling jobs, notes Talley. Labor-management agreements at two ports on both coasts ultimately funded early retirements, among other provisions, to mitigate painful job losses.

Efficient shipping expanded trade. Labor-intensive manufacturing is channeled to low-cost countries. Cheaper finished goods, of which shipping costs are now a negligible component, cross borders, making consumers better off. Even tiny companies can sell to global markets, easily and cheaply.

"I use the example in class of a pair of $120 Nike tennis shoes made in China. Of that $120, the transportation cost will be a little over $1 — it's virtually costless," Talley says. "Without containerization, there would not be a Wal-Mart or a Home Depot."

As for McLean, he saw how freight could be shipped better, faster, and cheaper, and grasped the simple idea that low-cost shipping could stimulate more shipping. Back then, Levinson says, people thought freight volume was more or less fixed. If more moved by water, then less would move by train. "McLean understood that was fallacious and that, in fact, people might start shipping more goods if there were more and cheaper ways to ship."

He got it right and reshaped the world's economy. **RF**

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FEDERAL RESERVE

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"Someone said that a strong macroeconomy is the best welfare policy," Thorbecke says. Many studies have documented that, across countries and time, higher inflation is associated with more poverty and lower incomes at the bottom of the income distribution. There's not a lot the Fed could do about distribution even if it wanted to, Blinder says, unless Congress gave the Fed different kinds of tools, like tax and transfer policies. "But that's way beyond the purview of the central bank."

In other words, while there is little doubt that the Fed's policies have unintended distributional effects, that doesn't make monetary policy a suitable tool to pursue distributional goals. A host of economic research suggests that the Fed should focus on price stability and avoid unpredictable policy shifts. Those measures are favored primarily because of their long-term economic benefits, but they also tend to minimize the redistributional effects that can result from monetary policy. **RF**

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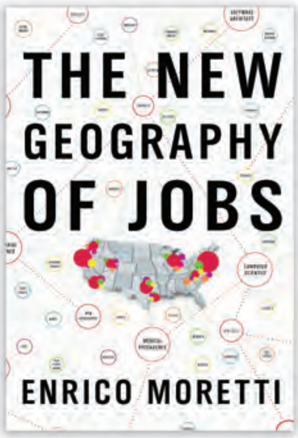


BookReview

Cities Growing Apart

THE NEW GEOGRAPHY OF JOBS
BY ENRICO MORETTI
NEW YORK: HOUGHTON MIFFLIN HARCOURT, 2012, 252 PAGES

REVIEWED BY DAVID A. PRICE

In the late 1990s and 2000s, numerous writers foretold the disappearance — or at least the shrinkage — of geography as a force in labor markets for knowledge workers. With the rise of the Internet and overnight delivery services, America seemed to be on a brink of a future in which software coders, marketers, and their counterparts in other professions would work from a beach, a backwoods cabin, or whatever location suited their humors. Companies, too, would be able to locate anywhere.

Yet markets for these workers seem to be moving in the opposite direction: The economic influence of geography is alive and growing. Not only that, but as the wages of more-educated workers relative to those of less-educated workers have been rising, the geographic concentration of more-educated workers in certain areas is widening the economic disparities among entire cities. That is the story told by University of California, Berkeley economist Enrico Moretti in *The New Geography of Jobs*.

Although there have always been differences in cities' economies, those differences are now increasing systematically and becoming self-reinforcing, Moretti reports. Cities with already-high levels of education in the 1980s, like Boston and San Francisco, have seen the educational levels — and prosperity — of their workforces increase further; education and pay in less-educated cities have been falling behind.

Moretti calls this trend the Great Divergence. It is driven by the geographical clustering of companies that comprise what he labels the "innovation sector" — industries based on highly skilled knowledge workers, such as information technology, life sciences research, finance, and some advanced manufacturing. Companies in the innovation sector have tended to be drawn into clusters to get the widest choice of skilled workers and to benefit from a shared commercial infrastructure of specialized service providers, among other reasons. Areas with such clusters, he notes, include Los Angeles for entertainment, Manhattan for finance, Seattle for software, and the Raleigh-Durham area for medical research.

Educated workers, in turn, are drawn to innovation-sector cities, both for their own jobs and, in the case of married workers, for those of their spouses. Moretti cites research by UCLA economists Dora Costa and Matthew Kahn showing that a society-wide increase in the pairing of highly educated people has made it more critical for those couples to settle in an area where they can both find quality innovation-sector jobs.

Although innovation-sector jobs normally comprise only a small part of a local economy, perhaps one-tenth, Moretti sees them as foundational; they support the metro with the prosperity that makes its way to local services industries. As manufacturing jobs have moved abroad, the ability of the manufacturing sector to serve this foundational function has dropped off. Thus, cities that have been the most successful in making the transition from manufacturing to innovation-sector industries have seen higher pay for their workforces in general, both the innovation-sector workers themselves and services workers.

How, then, does a city develop an innovation sector? What did policymakers do to transform California's agricultural Santa Clara Valley, for instance, into Silicon Valley? Moretti reports that the usual prescriptions are risky at best. The benefits of having a top university, for example, tend to be greatly overstated. Tax breaks and subsidies to draw desirable companies may succeed in attracting the companies and benefiting the local workforce, but the bidding war for a company can lead to a package with costs to the locality that exceed its benefits. The development strategy of appealing to educated workers with culture and a vibe of coolness is also problematic, he finds. There are plenty of cool cities, like Berlin, with lots of jobless educated workers, while other cool cities, like Seattle, became cool only after they became prosperous.

The New Geography of Jobs is a readable and cogent synthesis of Moretti's work and that of other labor and regional economists. Still, it is disquieting that the consensus model within which he is operating rests on a vision of tomorrow's economy in which 10 percent or so of Americans work in the innovation sector while the rest of us pour their coffee, polish their nails, and sell their homes. Underlying this vision is a bet that the United States will retain a comparative advantage in innovation-sector work over the long term. It's a proposition for which the historical record gives mixed support. With U.S. policymakers having accepted the loss of low-end manufacturing on the ground that Americans would always have high-end manufacturing, and then resigning themselves to the loss of much high-end manufacturing as well, what is the likelihood of that story playing out again at the level of "creativity" or "innovation"? Even with America's advantages of the moment in innovation industries, how much should America rely on the assumption that it will dominate them in the long term — at least to the extent that the innovation sector can sustain a broadly middle-class economy? Should a healthy city, and a healthy society, hedge that bet? **RF**

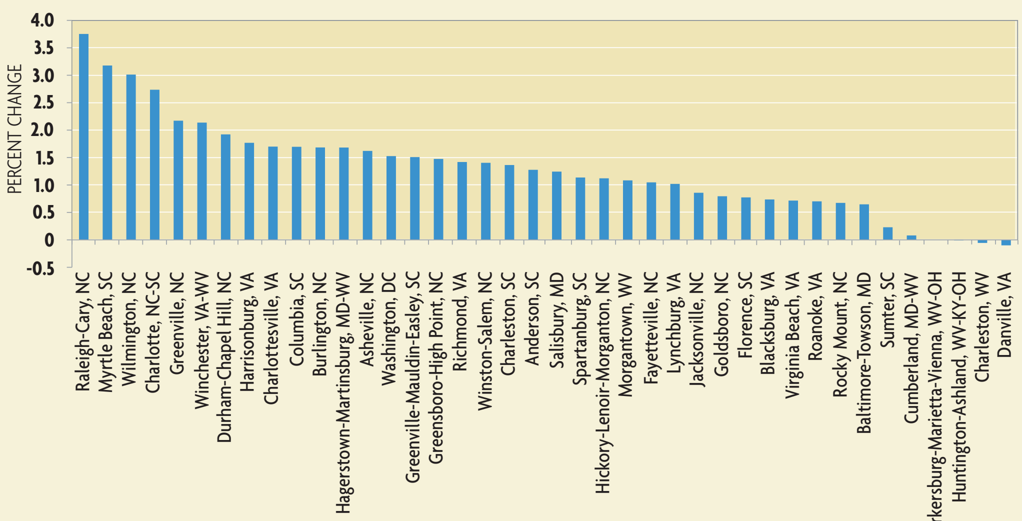
Dimensions and Drivers of Metro Area Growth: How Do Fifth District Metros Stack Up?

BY ANN MACHERAS AND JAKE BLACKWOOD

Metropolitan areas across the country vie to be the fastest growing, the most attractive to younger generations, and the most suitable for new business. Growth provides a city with tax revenues to finance maintenance and enhancements to infrastructure, public spaces, cultural amenities, education, and other benefits, perpetuating the positive cycle that attracts even more businesses and skilled workers to remain competitive. A city with a stagnating or contracting population will soon find fewer of its young people returning home after college because of a lack of employment opportunities. Indeed, the quality of life that comes along with a healthy job environment and plentiful options for cultural and recreational activities requires a critical mass of population to support and participate in the life of the city.

Growth in a metropolitan area can be measured in various ways. The most obvious is an increase in the population, but of course, growth in the number of residents is not beneficial in and of itself unless there are productive opportunities for work. Both population growth and income growth are important for assessing the vitality of metropolitan areas. By looking at data on drivers of growth for different metro areas in the Fifth District, we can get a better understanding of where the region's growth is likely to be strongest in the future (see chart).

Fifth District Metros: Average Annual Population Growth, 1990-2010



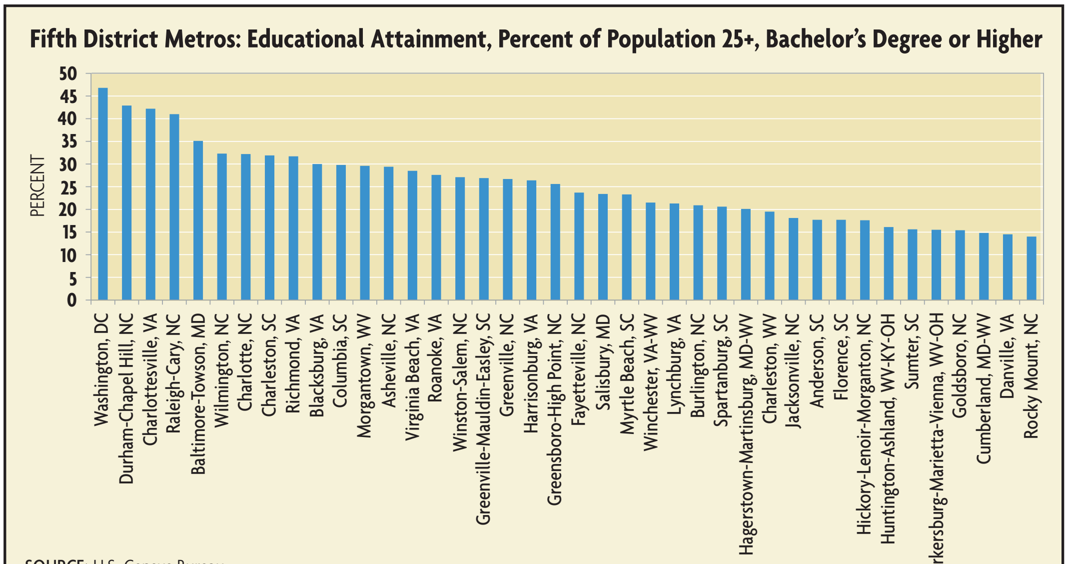
SOURCE: U.S. Census Bureau

Understanding the Drivers of Regional Growth

What causes some metropolitan areas to grow more quickly than others? Many factors matter, but their relative importance evolves over time. For example, many metros thrived due to natural advantages such as proximity to waterways for easier transportation of goods or access to nearby natural resources for production. This was particularly true when manufacturing activity dominated the economy, but it does not matter as much in the more diverse economy today. More recently, metropolitan areas in the South and West have benefited from migration based on their climates, which are considered more favorable than those of their counterparts in the North. Beyond these place-specific elements, a major focus in urban economics research has highlighted the importance of agglomeration economies, more generally referred to as economies of scale, as a contributor to the growth of metropolitan areas.

Agglomeration effects relate to the size and density of the city, known as urbanization economies, or to the concentration of a particular industry within a city or region, referred to as localization economies. Increased urbanization provides firms across industries with the variety of business services and easy access to specialized labor that improve productivity. An example of this is the wide range of industries that have thrived in New York City, where industries as different as financial services and fashion design can benefit from an array of service providers, such as law firms that offer specialized legal counsel to sophisticated businesses, as well as from a highly educated pool of labor. Similarly, localization economies offer firms within the same and closely related industries benefits from knowledge spillovers, access to a common specialized labor pool, and economies of scale in accessing intermediate goods.

In Upstate South Carolina, growth in companies that produce automotive parts and equipment has flourished since BMW established an automotive assembly plant in Spartanburg in 1994. These companies, which



SOURCE: U.S. Census Bureau

now number over 150, benefit from a skilled local workforce and nearby university and community college programs that support ongoing training and research needs for the automotive cluster. Moreover, when firms and their workers operate in closer proximity to each other, they are afforded opportunities to learn from each other and apply expanded knowledge to production or to the provision of services. It makes sense, then, that as production has shifted toward services and toward goods that rely on more skilled labor and greater technology, the importance of agglomeration effects has likely overtaken the contribution of natural advantage in explaining growth across metropolitan areas.

Agglomeration economies drive growth in metropolitan areas, but what matters most in creating these economies? Improvements in data collection and estimation methods have allowed for empirical research that clearly connects the importance of human capital to metropolitan area growth. Population growth in metropolitan areas with high educational attainment has far surpassed growth of metropolitan areas with low educational attainment. A 2004 study by Edward Glaeser of Harvard University and Albert Saiz of the University of Pennsylvania found that metropolitan areas where less than 10 percent of adults had bachelor's degrees in 1980 grew by 13 percent in the 1980-2000 period, while metropolitan areas with a higher share of college-educated adults (more than 25 percent) grew almost three times as fast, at an average rate of 45 percent (see chart).

The researchers tested the direction of the relationship as well. They looked at the question of whether skilled workers flock to the cities that are already growing or whether cities grow because they have a higher share of educated workers. They found that many variables are positively correlated with metropolitan area growth, including a warmer and drier climate, but that the human capital related variables have the most significant effect. Furthermore, measures of human capital matter for growth even when controlling for other important variables. On the other hand, when they considered the possibility of reverse causality — that differences in growth rates predict the percentage of the population with a college education — they found that this holds for only a small number of declining metro areas and found no support for this in growing metro areas.

Using an alternative approach to analyze the growth path of metropolitan areas, economists from the St. Louis Fed and the University of Oregon found in a 2008 article in the *Journal of Urban Economics* that different factors may influence growth in metropolitan areas during periods of low growth versus periods of high growth. They found that human capital plays an important role in high-growth phases, but does not seem to matter as much in low-growth phases. (However, the share of employment engaged in manufacturing is a significant contributor to declining growth when the economy is in a low-growth phase.)

Another area of economic research on urban growth focuses on clusters of occupations in a metropolitan area and how they can be classified to provide additional information on the level of knowledge within the area, beyond the simple share of college-educated adults. This research stresses the fact that college graduates are not all alike, representing a broad array of skills, and that some of the occupation clusters, such as those that demonstrate a high level of knowledge about commerce and information technology, are stronger predictors of growth than other occupations.

Comparing Drivers of Growth Across Metros

Metropolitan areas in the United States grew on average at a rate of 1.2 percent from 1990 to 2010, a period sufficiently long to examine how base-year attributes, such as educational attainment and industry mix, correspond with slower or faster growth in population. For a simple examination of these key variables, the metropolitan areas were combined into four groups based on quartiles of population growth from 1990 to 2010. Each quartile contains 90 metropolitan areas, for a total of 360 for which the data is complete over the period. The summary information on educational attainment, industry mix, and population growth revealed some interesting patterns that align reasonably well with the economic theory (see Table 1).

The slowest-growing group of metropolitan areas had the lowest level of educational attainment in 1990, with 75.2 percent of the population over age 25 having graduated from high school and 16.6 percent holding a bachelor's degree or more. The average annual population growth for this group of metros was only 0.1 percent from 1990 to 2010. Further, the industry mix for these areas was heavily weighted toward manufacturing, which accounted for more than 20 percent of employment in 1990. In contrast, the fastest-growing 25 percent of metropolitan areas started the period with nearly 20 percent of the population over age 25 holding a bachelor's degree or more and a much smaller share of employment, only 13.8 percent, engaged in the manufacturing sector. Population growth for this group of metros averaged 2.4 percent annually from 1990 to 2010, more than 20 times faster than the slowest-growing group.

The comparison of metropolitan areas using the indicators from the starting year suggests that higher growth rates occurred where skilled workers were already more concentrated. When we review the same growth determinants for the end of the period, we find that the same relative advantages hold up, as the faster-growing half of the metropolitan areas had higher levels of college attainment (see Table 2).

In addition, we have information on occupation mix for 2010 that we do not have for the earlier base year. As measured by the number of workers per thousand, the fastest-growing metropolitan areas had a higher share of workers in knowledge intensive occupations in 2010. Combining computer science and mathematical occupations as well as architectural and engineering occupations, the slowest-growing metropolitan areas averaged 31 workers (per thousand) engaged in this type of work, while the fastest-growing metropolitan areas averaged 37 workers in these highly skilled occupations. Thus, a worker in a fast-growing area is 20 percent more likely to be in a knowledge-intensive occupation than a worker in a slow-growing area. Conversely, the slowest-growing metropolitan areas had a much higher concentration of production workers per thousand employed — 83 workers compared to 59 workers in the fastest-growing areas.

Growth in per capita income is often viewed as an indicator of growth and economic development because it suggests an improvement in standard of living and not just an increase in the number of inhabitants. To explore the relationship between income growth and the key growth indicators, we divided the metropolitan areas into four quartiles based on average annual growth in per capita income from 1990 to 2010. Similar to the findings for population growth, the share of college-educated adults increased as we moved from the slower-growing metropolitan areas to the group that had higher income growth. This is not surprising, since college-educated workers tend to earn higher wages than less-educated workers. Also, the share of employment in manufacturing declined when we compared metropolitan areas with slower per capita income growth to those areas with higher income growth, similar to the comparison for population growth.

Table 1

Growth and 1990 Baseline Variables	Metropolitan Areas Grouped by Average Annual Population Growth, 1990-2010			
	Bottom 25%	2nd quartile	3rd quartile	Top 25%
Average annual population growth, 1990-2010	.11	.81	1.3	2.4
Percent high school graduate and above (1990)	75.2	75.5	76.6	75.1
Percent bachelor's degree or above (1990)	16.6	19.2	20.3	19.6
Manufacturing share of total employment, 1990	20.4	18.3	16.3	13.8
Professional and business services share of total employment, 1990	6.9	7.6	7.5	7.8

SOURCES: U.S. Census Bureau and Bureau of Labor Statistics

Table 2

Summary for 2010	Metropolitan Areas Grouped by Average Annual Population Growth, 1990-2010			
	Bottom 25%	2nd quartile	3rd quartile	Top 25%
Percent high school graduate and above	87.3	86.0	87.0	84.3
Percent bachelor's degree or above	23.0	25.6	27.3	26.2
Manufacturing share of total employment	11.6	11.1	10.0	7.7
Professional and business services share of total employment	9.7	10.2	10.8	11.3
Patents per 100,000 population	22	39	27	24
Management worker share*	40	43	42	42
Computer and mathematical worker share*	15	19	20	20
Architectural and engineering worker share*	16	17	17	17
Production worker share*	83	76	72	59

*Per 1,000 workers

SOURCES: U.S. Census Bureau and Bureau of Labor Statistics

Fifth District Metropolitan Area Growth

Within the Fifth District, there are 40 metropolitan areas for which we have data to make similar comparisons of the key growth drivers (see Table 3). Annual population growth for 1990 through 2010 averaged 1.3 percent for Fifth District metropolitan areas, compared with a slower 1.1 percent for other metro areas. Per capita income growth was the same for Fifth District metros and non-District metros, however, with average growth at 3.8 percent.

Educational attainment at both the high school and college level was lower for the Fifth District in the base year of 1990. The percentage with a high school diploma or above was 71.3 percent for Fifth District metros, but 76.2 percent for other metro areas. The share of college educated was 18.1 percent in the Fifth District metros and 19.1 percent in other metro areas. The base year share of employment in the manufacturing sector was nearly 21 percent in the Fifth District metros, but not quite 17 percent elsewhere.

If we fast forward to 2010, college education attainment in Fifth District metros had largely caught up to the non-District metros, with both running at just over 25 percent. The difference in manufacturing concentration also diminished substantially, although it was still a bit higher in the Fifth District metros than it was for non-District metros (11 percent compared to 10 percent). As might be expected, because of the Fifth District metro areas' higher concentration in manufacturing, they had a higher share of production workers per 1,000 employees. The Fifth District metro areas also had a higher share of computer and mathematical workers compared to metros outside of the Fifth District.

Two Fifth District metropolitan areas — Burlington, N.C., located in the north central part of the state, and Danville, Va., in Southside Virginia — can serve as a case study illustrating the effect of educational attainment. The two had a nearly equal population in 1990: 108,213 for Burlington and 108,711 for Danville. Population remained nearly flat in Danville over the period from 1990 to 2010, while Burlington experienced an average annual population growth rate of 1.7 percent over this period, higher than the average rate of growth for all metropolitan areas nationally. Both metropolitan areas were dependent on textile manufacturing and have undergone structural shifts in their economies toward nonmanufacturing sectors. In 1990, manufacturing accounted for just over 21 percent of employment in Burlington and 16 percent in Danville, but by 2010 the concentration in manufacturing had declined dramatically in both areas, to 8.4 percent and 6.4 percent, respectively.

Burlington and Danville differ in other ways, not the least of which is the location of Burlington on a major interstate, I-85, connecting Richmond and Atlanta. In addition to its proximity to major interstates, Burlington and Danville also differ in terms of the higher education institutions that are located within each metro area or within a reasonable driving distance. The Burlington metro area is home to Elon University, with an annual on-campus enrollment of approximately 5,000 students, whereas Danville is home to Averett University, with an annual residential enrollment of only 1,000 students. Moreover, while both metro areas enjoy proximity to the larger research universities in the Greensboro metro area, including Wake Forest University and UNC-Greensboro, only the Burlington metro has the distinct advantage of a relatively short commute to Duke University and the University of North Carolina at Chapel Hill. In addition, the Burlington metro area is also close to the Research Triangle Park, which provides a unique collection of research and development facilities with a heavy concentration of knowledge intensive industry.

Notwithstanding these fortunate accidents of geography enjoyed by Burlington, the two metropolitan areas are also distinguished by important differences in human capital within their borders. As measured by completion of high school or attainment of a bachelor's degree, educational achievement for adults was much lower in Danville in 1990. Neither metro matched the all-metro area average of 76 percent high school or above and 22 percent bachelor's or higher for the population age 25 and older. Burlington had a college graduate percentage of 15 percent compared to only 10 percent in Danville, while the high school graduate and above shares were 68 percent and 57 percent, respectively.

Fortunately, both metropolitan areas made substantial progress over the subsequent 20 years, and by 2010 high school educational attainment nearly converged in the two metro areas, with just over 81 percent of the adult 25+ population holding at least a high school degree in Burlington, relative to 78 percent in Danville. The differential in college graduate achievement also held up in 2010, but both metros raised this share as well, to near 21 percent for Burlington and 15 percent for Danville. Further, the level of knowledge-based occupations in Burlington's workforce outpaced the mix in Danville in 2010, with 24 workers per thousand engaged in computer science and mathematical occupations or architectural and engineering occupations, compared to 11 workers in Danville. While other factors may also be important, it appears that Burlington had a clear advantage over Danville in terms of education and skill levels and this contributed to a faster pace of population growth.

Table 3

Growth and Key Variables	Metropolitan Areas Grouped by Average Annual Population Growth, 1990-2010			
	Fifth District		Other (non-District)	
	1990	2010	1990	2010
Average annual population growth, 1990-2010	1.3		1.1	
Per capita personal income, average annual growth, 1990-2010	3.8		3.8	
Percent high school graduate and above	71.3	84.9	76.2	86.3
Percent bachelor's degree or above	18.1	25.4	19.1	25.5
Manufacturing share of total employment	20.8	10.8	16.7	10.0
Professional and business services share of total employment	7.5	12.2	7.4	10.4

SOURCES: U.S. Census Bureau and Bureau of Labor Statistics

Implications for the Future

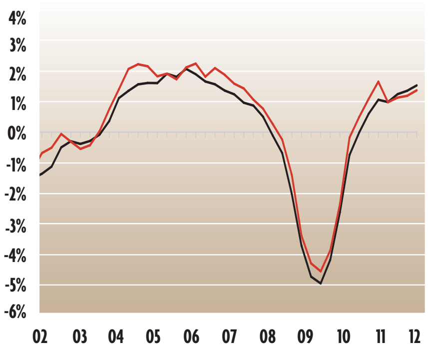
Metropolitan areas need to pay close attention to the educational opportunities and outcomes provided in their region in order to promote a growing, dynamic economy that attracts the knowledgeable workforce required for today's industries. Our review of metropolitan area data for the period from 1990 to 2010 confirms that metro areas which started with a higher concentration of skilled workers tended to grow by far the fastest in population over this two-decade period.

The fastest-growing metropolitan area in the Fifth District, Raleigh-Cary, North Carolina, is a microcosm of this effect. It ranked fifth nationally for population growth from 1990 to 2010, growing at an average annual rate of 3.8 percent. Raleigh-Cary posted very high rates of educational attainment for the adult population (25+) at the beginning of the study period, with 81 percent holding at least a high school diploma and 30 percent holding a bachelor's degree or higher. This skilled population attracted even more knowledge workers over the years, as the educational attainment rates reached 91 percent for high school and 41 percent for college-educated graduates by 2010. While Raleigh-Cary is an exceptional case, other metropolitan areas within the Fifth District have gained ground. Yet based on the comparison of Fifth District to other (non-District) metro areas, there are still opportunities for investment in human capital to continue to attract knowledge workers and the learning and innovation they foster. **RF**

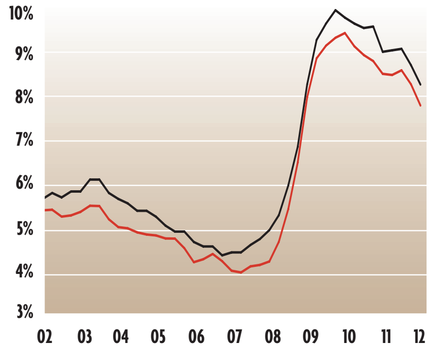
State Data, Q1:12

	DC	MD	NC	SC	VA	WV
Nonfarm Employment (000s)	**735.5**	**2,583.3**	**3,957.9**	**1,851.0**	**3,709.8**	**762.5**
Q/Q Percent Change	-0.2	0.7	0.7	0.7	0.3	0.3
Y/Y Percent Change	1.6	1.8	1.2	1.4	1.1	1.8
Manufacturing Employment (000s)	**1.0**	**111.1**	**437.3**	**221.2**	**228.1**	**48.8**
Q/Q Percent Change	0.0	-0.4	0.9	0.6	0.0	-1.2
Y/Y Percent Change	-6.3	-2.5	0.9	4.6	-0.7	-1.3
Professional/Business Services Employment (000s)	**151.3**	**406.3**	**516.3**	**226.9**	**667.1**	**63.5**
Q/Q Percent Change	-0.2	1.9	0.7	-1.4	0.7	1.3
Y/Y Percent Change	1.7	3.2	2.1	2.4	0.5	2.9
Government Employment (000s)	**246.0**	**510.0**	**702.0**	**340.0**	**715.0**	**154.8**
Q/Q Percent Change	-1.0	-0.1	0.4	0.9	0.2	0.8
Y/Y Percent Change	-1.9	1.0	-0.1	-0.4	1.0	2.6
Civilian Labor Force (000s)	**347.7**	**3,083.6**	**4,683.7**	**2,155.9**	**4,342.2**	**803.3**
Q/Q Percent Change	0.9	0.1	0.3	-0.2	0.1	0.2
Y/Y Percent Change	0.5	0.4	1.0	0.1	1.4	0.3
Unemployment Rate (%)	**9.8**	**6.5**	**9.9**	**9.1**	**5.7**	**7.1**
Q4:11	10.2	6.7	10.5	9.8	6.2	7.8
Q1:11	10.0	7.2	10.4	10.5	6.3	8.1
Real Personal Income ($Mil)	**40,034.2**	**261,840.3**	**306,693.3**	**138,570.6**	**328,991.9**	**55,027.4**
Q/Q Percent Change	0.3	0.3	0.2	0.2	0.3	0.0
Y/Y Percent Change	1.5	0.6	0.0	0.4	0.8	1.6
Building Permits	**260**	**3,011**	**11,126**	**4,417**	**6,572**	**384**
Q/Q Percent Change	-83.0	-3.1	39.5	4.2	53.8	-8.8
Y/Y Percent Change	-63.6	24.7	31.3	23.8	12.6	5.5
House Price Index (1980=100)	**577.8**	**410.0**	**303.4**	**306.6**	**397.1**	**213.9**
Q/Q Percent Change	0.3	-1.7	-1.5	-1.8	-1.5	-1.6
Y/Y Percent Change	3.2	-1.1	-2.3	-2.2	-0.6	-1.8

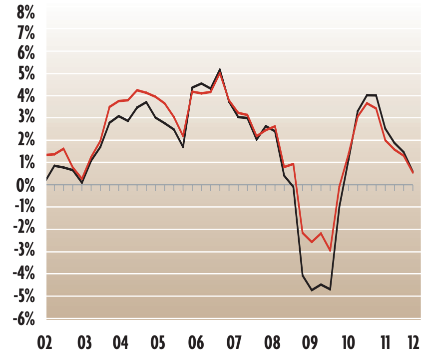
Nonfarm Employment
Change From Prior Year
First Quarter 2002 - First Quarter 2012



Unemployment Rate
First Quarter 2002 - First Quarter 2012

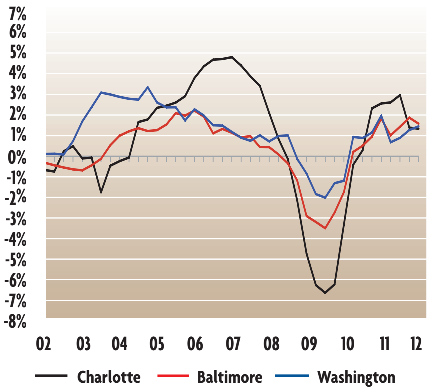


Real Personal Income
Change From Prior Year
First Quarter 2002 - First Quarter 2012

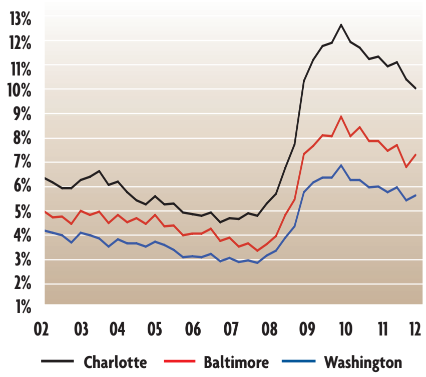


Fifth District United States

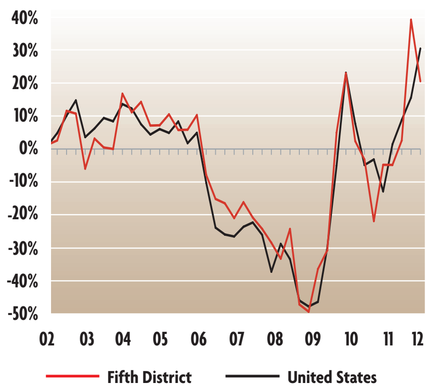
Nonfarm Employment Metropolitan Areas
Change From Prior Year
First Quarter 2002 - First Quarter 2012



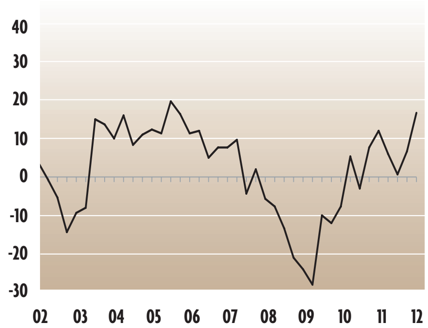
Unemployment Rate Metropolitan Areas
Change From Prior Year
First Quarter 2002 - First Quarter 2012



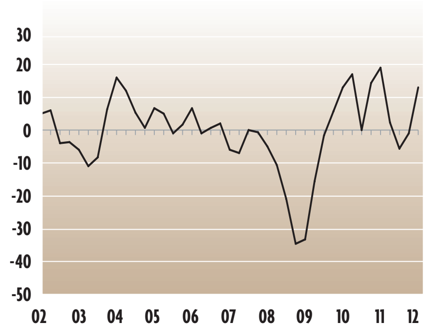
Building Permits
Change From Prior Year
First Quarter 2002 - First Quarter 2012



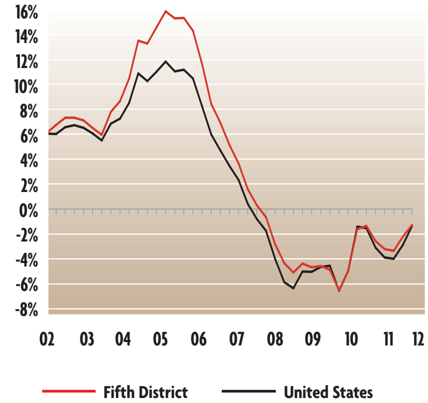
FRB—Richmond Services Revenues Index
First Quarter 2002 - First Quarter 2012



FRB—Richmond Manufacturing Composite Index
First Quarter 2002 - First Quarter 2012



House Prices
Change From Prior Year
First Quarter 2002 - First Quarter 2012



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.

Metropolitan Area Data, Q1:12

	Washington, DC	Baltimore, MD	Hagerstown-Martinsburg, MD-WV
Nonfarm Employment (000s)	**2,434.6**	**1,286.8**	**97.7**
Q/Q Percent Change	-0.1	-2.1	-1.6
Y/Y Percent Change	1.5	1.4	0.0
Unemployment Rate (%)	**5.5**	**7.0**	**8.3**
Q4:11	5.7	7.1	8.7
Q1:11	5.9	7.8	9.3
Building Permits	**3,947**	**1,323**	**125**
Q/Q Percent Change	-11.6	-12.9	-3.8
Y/Y Percent Change	-5.0	22.6	0.0

	Asheville, NC	Charlotte, NC	Durham, NC
Nonfarm Employment (000s)	**169.1**	**826.4**	**275.4**
Q/Q Percent Change	-0.9	-1.1	-0.8
Y/Y Percent Change	2.1	1.3	1.9
Unemployment Rate (%)	**8.0**	**10.0**	**7.8**
Q4:11	8.4	10.7	8.2
Q1:11	8.6	11.1	8.0
Building Permits	**223**	**2,796**	**1,037**
Q/Q Percent Change	1.8	97.9	61.8
Y/Y Percent Change	-22.3	95.7	127.4

	Greensboro-High Point, NC	Raleigh, NC	Wilmington, NC
Nonfarm Employment (000s)	**344.1**	**512.2**	**133.2**
Q/Q Percent Change	-0.6	-0.8	-2.1
Y/Y Percent Change	1.7	2.3	-0.2
Unemployment Rate (%)	**10.2**	**8.1**	**10.2**
Q4:11	10.9	8.6	10.8
Q1:11	11.0	8.5	10.4
Building Permits	**725**	**2,309**	**751**
Q/Q Percent Change	18.7	35.5	80.5
Y/Y Percent Change	11.7	111.3	93.1

	Winston-Salem, NC	Charleston, SC	Columbia, SC
Nonfarm Employment (000s)	**204.6**	**295.7**	**348.6**
Q/Q Percent Change	-2.0	-0.3	-0.6
Y/Y Percent Change	1.4	2.2	2.0
Unemployment Rate (%)	**9.4**	**7.6**	**7.8**
Q4:11	9.8	8.1	8.5
Q1:11	10.1	8.5	8.6
Building Permits	**341**	**1,032**	**836**
Q/Q Percent Change	-23.5	-16.7	35.3
Y/Y Percent Change	69.7	43.5	6.4

	Greenville, SC	Richmond, VA	Roanoke, VA
Nonfarm Employment (000s)	**303.2**	**611.5**	**154.0**
Q/Q Percent Change	-1.2	-0.5	-2.0
Y/Y Percent Change	1.6	1.9	0.2
Unemployment Rate (%)	**7.4**	**6.4**	**6.1**
Q4:11	8.0	6.8	6.6
Q1:11	8.7	7.1	6.8
Building Permits	**522**	**1,021**	**82**
Q/Q Percent Change	27.6	52.6	-8.9
Y/Y Percent Change	21.1	67.4	-23.4

	Virginia Beach-Norfolk, VA	Charleston, WV	Huntington, WV
Nonfarm Employment (000s)	**726.2**	**146.6**	113.7
Q/Q Percent Change	-1.7	-1.6	-1.0
Y/Y Percent Change	0.5	0.9	1.5
Unemployment Rate (%)	**6.6**	**6.6**	**7.7**
Q4:11	7.0	7.4	8.2
Q1:11	6.9	7.5	8.4
Building Permits	**1,897**	**31**	**31**
Q/Q Percent Change	91.6	72.2	24.0
Y/Y Percent Change	63.8	29.2	675.0

For more information, contact Sonya Ravindranath Waddell at (804) 697-2694 or e-mail Sonya.Waddell@rich.frb.org

Opinion

Economics, Uncertainty, and the Environment

BY JOHN A. WEINBERG

This issue of *Region Focus* features an article on the debate over using "fracking" to extract natural gas from shale deposits. The process, as the article points out, is controversial and the analysis complicated. Critics claim that fracking could make drinking water unsafe and, in some cases, may increase the potential for earthquakes. Proponents argue that such claims are exaggerated and that fracking could tap unused resources and boost the nation's energy supply, driving down prices in that sector. In addition, there are the jobs that would accrue to the communities where fracking would take place — the same communities that *might* be hardest hit by environmental problems.

The reason that I italicized "might" in the previous sentence is that, as an economist, I don't really know how likely it is that fracking could cause such environmental damage. And if such damage were to occur, I don't know how costly it would be. The best that I can do is to rely on expert opinion from scientists who have studied fracking — but even they cannot be sure about the costs. So I am left in a quandary about how to evaluate the issue.

In general, when economists are asked to address environmental questions, they are inclined to say that property rights should, if feasible, be assigned in a way that will "internalize" the social costs of any private activity. In the case of fracking, though, we don't know with certainty if the activity will contaminate drinking water until after companies have started work; we also don't know if it will contribute to earthquakes. Both could have enormous costs — costs that firms might be unwilling to bear if they knew of them in advance. So it is very hard to make the calculation of how much, if at all, to effectively tax firms that wish to engage in fracking. This, potentially, could be an argument for delaying firms from acting at all. Until scientists can give us more precise estimates of the costs of fracking, we may decide it would be better to wait. Those costs could be larger than the benefits of tapping the additional energy — and thus larger than the firms themselves would want to bear if they had such information today. I make this point not as an environmental scientist, or environmental economist, but simply as an economist who recognizes the challenges of doing cost-benefit analysis for this kind of problem.

Such considerations are useful when thinking about how to address other environmental issues, including global warming. As with the potential dangers of fracking, I am not in a position to say whether the earth is warming. Most scientists believe that it is, but they have widely varying estimates about its magnitude and the associated present and future costs. The estimates of the effects range from catastrophically negative (due to rising sea levels and melting ice sheets) to slightly positive (due to greater crop yields in some parts of the world). Given such uncertainty about the effects of global warming — combined with the certain large costs of significantly curtailing economic activity that is believed to lead to global warming — one could make a case for not taking widespread preventative measures. But, at the same time, there is also a strong case for being somewhat more aggressive in pursuing policies — including being more vigilant about internalizing social costs — that could reduce the probability of significant global warming that would impose enormous costs on future generations.

Some economists and ethicists would object to enacting any policies that might make the present population poorer — including those aimed at curbing global warming — in an effort to aid future generations. The reason, they would argue, is that such policies could have perverse redistributive effects. Although the recovery from the financial crisis and recession has been sluggish, it is likely that the economy will eventually rebound and continue to grow on its long-term trend path of roughly 3 percent a year. What this means is that our children will be wealthier than us, and their children wealthier than them. Why should a poorer population sacrifice some prosperity to aid wealthier populations, critics would ask?

> Why should a poorer population sacrifice some prosperity to aid wealthier populations?

It's a good question, and one that's inherently hard to answer. Almost everyone would agree that we should avoid regressive policies — those that benefit the relatively rich at the expense of the relatively poor. But in the case of global warming, we just don't know if our actions today might impose costs on future generations that are so large that they would be unable to effectively mitigate them. To not try to address such a possibility would be irresponsible. That doesn't mean we should take drastic and reactionary steps, such as severely taxing or outright prohibiting the use of fossil fuels. Such actions would be even more irresponsible than denying that global warming may exist and its future costs might be significant. Instead, it means seeking appropriately cautious remedial actions that would not significantly alter our way of life but potentially save future generations from tremendous harm. Think of it as a catastrophic-care insurance policy. **RF**

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

NextIssue

Mobile Payments
For many Americans, the mobile phone has replaced a number of formerly indispensible items: the desk calendar, the Rolodex, and the morning paper. In some countries, the cellphone has also largely replaced the wallet when it comes to exchanging money and paying for goods and services. As the United States also begins developing mobile payment options, how will consumers benefit from carrying their own personal bank in their phones? And what security and regulatory concerns need to be addressed for mobile payments to gain widespread acceptance?

Vocational Training
Some nations prepare their youth for the workforce with highly developed programs of skills training and apprenticeships. The United States, in contrast, tends to steer students toward general education, which arguably sets the stage for later learning and on-the-job training. But some say we should draw more from the vocational approach.

Where Does the Federal Government Get the Money It Spends?
Since the advent of the personal income tax in 1913, the United States has relied on an evolving mix of taxes and borrowing to pay its bills. How are Americans paying for federal programs today, and who is likely to pay more in the future?

Federal Reserve
Stress tests are a tool to help regulators determine whether banks have sufficient capital to withstand a downturn in the economy. The Fed has conducted several major rounds of stress testing since the 2008 financial crisis. What are the benefits and costs of stress tests? Are they here to stay?

Economic History
Several areas of the Fifth District are major centers of video game development, including the Hunt Valley region of Maryland; Fairfax County, Va.; and Cary, N.C. What brought the video game industry to these areas? Have agglomeration effects benefited the companies?

Policy Update
A new Maryland law prevents employers from requiring employees and job applicants to divulge passwords for social media accounts. Similar legislation is pending in Congress and in at least 13 states.

Federal Reserve Bank of Richmond
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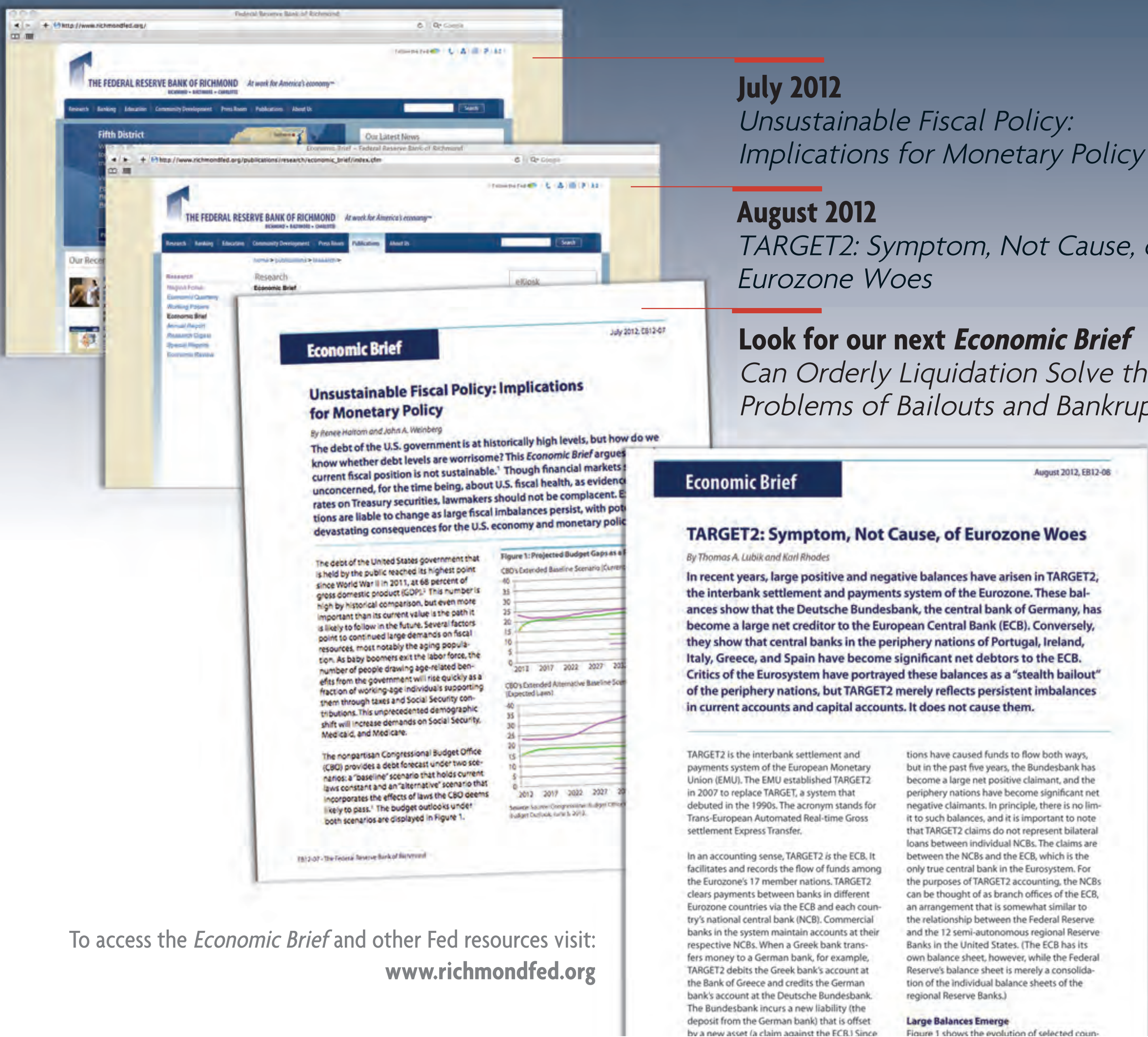

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