

# ECON FOCUS

## QUANTITATIVE TIGHTENING

The Fed starts to reverse  
its crisis actions



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Supply Shocks and  
Monetary Policy

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Rural Areas Paying  
Newcomers

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The Rise and Stall  
of the Mall

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Following Through

Cover Image: iStock/Getty Images

# A Shift in the Inflation Winds?

**A**t the Fed, a lot of work has gone into anchoring inflation expectations in recent decades. As a result, our economy has seen, from the early 1980s until last year, an era of remarkably low and stable inflation — sometimes called “the Great Moderation.”

During this period, the wind may have been at our backs when it came to containing inflation. Globalization, especially the rise of India and China, gave producers more access to lower-cost labor and gave consumers more access to lower-cost products. The explosive growth of e-commerce made price comparisons easier for consumers and cut costs for retailers. Fracking provided additional supplies of natural gas and oil. The labor force grew strongly, both from rising population numbers — via the baby boom and high levels of immigration — and from more women entering the workforce. And the federal government during this era ran relatively low deficits, meaning lower inflationary fiscal impulses.

Still another factor, usually unsung, is the rise of professional purchasing organizations in large firms, especially big-box retailers and large manufacturers. These exerted continual year-over-year pressure on costs, and consequently on prices. If you were a purchasing agent at, say, a major home improvement chain, your job every year was to grind out another few percent in expense savings. That's disinflationary.

These forces particularly influenced pricing for goods. Goods inflation for the 20 years ending in 2019 was low at 0.4 percent per year, while services grew at 2.6 percent a year, leaving core inflation near target at 1.7 percent.

But the Fed's success wasn't simply a matter of circumstance; it depended on recognizing those factors and adjusting. The best known such moment was



probably in the late 1990s, when the Fed deferred interest rate increases, recognizing that productivity gains from technology would limit inflationary pressure.

Now, of course, the wind seems to have shifted. We've seen tariffs, the pandemic, and the Russian invasion of Ukraine lay bare the vulnerabilities associated with offshoring and a complex global supply chain. We are likely to see some deglobalization, as countries rethink their trading relationships. And firms may redesign their supply chains to prioritize resiliency, not just efficiency. All other things equal, these changes will likely mean higher costs over time.

We may also see long-term tightness in the supply of labor. Offshore labor may prove less available. At the same time, our population is aging. Birth rates are declining. We missed out on millions of immigrants during the pandemic. Unless we can find a way to reduce labor demand (for example, through automation) or increase participation (as Japan has done with older workers), a tighter labor market could also pressure wages, and in turn, prices.

Fiscal policy may also contribute to the headwinds. Government deficits have run at historic levels, and entitlement spending looks to grow further as the population ages. Climate transition could increase energy costs.

Should these trends persist, real forces will be more likely to create near-term inflationary pressure. As a consequence, our efforts to stabilize inflation expectations could require periods where we tighten monetary policy more than has been our recent pattern. You might think of this as leaning against the wind. Doing so would be consistent with our flexible average inflation targeting framework.

But it's a little early to make these judgments. Fed policymakers will watch for persistent headwinds and adjust how we navigate. Our target — 2 percent inflation — wouldn't change, nor would our longer-run ability to meet that goal. But we will remain open to altering the appropriate path to achieve it.

*A longer version of this essay was delivered as an address to the Money Marketeers of New York University on April 12, 2022.*

BY KATRINA MULLEN

## New from the Richmond Fed's Regional Matters blog

### Hailey Phelps. "Shifting Populations: Results From 2021 Census Estimates."

The U.S. Census Bureau released its Vintage Estimates, or annual estimates of national, state, and local population and components of change. These numbers, shared yearly between decennial censuses, suggest how the COVID-19 pandemic has affected workers' decisions on where to live. Between July 2020 and July 2021, the United States experienced its slowest annual rate of population growth in its history, though 33 states, including the Carolinas and Virginia in the Fifth District, increased their populations. The population decline is mostly due to natural change (the difference between number of births and number of deaths) and domestic migration, although the increases and decreases tend to vary by state as well as between urban and rural counties.

### Sierra Latham and Tiffany Hollin-Wright. "Rural Spotlight: Creating a Reservoir of Housing Resources in New River Valley."

Rural communities — particularly low- and middle-income households — are facing workforce housing shortages due to high housing costs and tight homebuying and rental markets. (See "Housing the Workforce in the Rural Fifth District," *Econ Focus*, First Quarter 2022.)

Intermediary organizations, including southwest Virginia's New River Valley Regional Commission (NRVRC), aim to support housing policy and funding. More than a decade ago, NRVRC partnered with the town of Blacksburg, Va., to create the NRV HOME Consortium — providing affordable rental and ownership housing units for residents earning less than 80 percent of the area median income. Today, the NRVRC continues to leverage its resources and partnerships by securing grant funding to meet the area's housing needs.

### Jason Kosakow. "What's Behind Firms' Reported Improvements in Meeting Demand?"

Compared to previous Richmond Fed surveys of business conditions, responding firms in the June survey said they are more able to meet customer demand, and a majority of firms expect to fully meet demand in the next 12 months. The ability to meet demand is still below pre-pandemic levels, but the percentage of firms able to meet at least 75 percent of demand rebounded to 81 percent in June from 73 percent in February. The

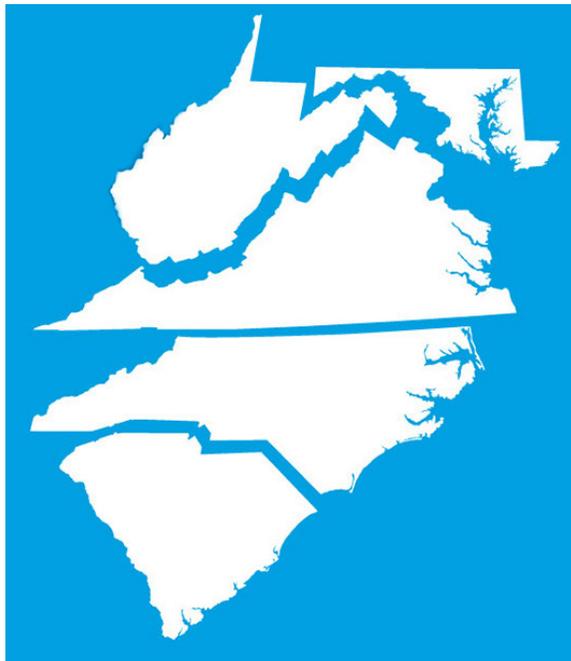
reasons for these improvements may be that firms have boosted their workforces and improved their supply chains as well as seeing softened demand. While much has changed from previous surveys, the availability of labor, finding and paying for inputs, and timely freight services continue to be the top issues constraining firms' ability to meet demand.

### Laura Dawson Ullrich. "Second-Chance Hiring: Fifth District Efforts to Improve Post-Incarceration Outcomes."

Since the onset of the COVID-19 pandemic, jail and prison populations have declined. With job postings exceeding the number of people actively seeking employment, previously incarcerated individuals make up an important demographic that could not only contribute to the labor force, but also improve economic outcomes. In the Fifth District, Johns Hopkins Hospital has engaged in second-chance hiring for more than 15 years, seeing positive five-year outcomes; an organization in South Carolina, Turn90, uses a four-component approach (therapy, transitional work, case management, and permanent job placement) to help men as they reenter society.

### Nicholas Haltom. "Mapping Outcomes Across Rural and Urban Communities."

The Richmond Fed's Regional and Community Analysis team has been building data products, including rural-urban comparison maps, to provide data users and local and state leaders with information on geographic differences across a variety of indicators. To measure these differences, the team considers two factors: employment and educational attainment. Employment comparisons are based on the employment-to-population (EPOP) ratios (or the number of employed residents divided by population for working-age adults). The researchers concluded that in the Fifth District, about one-fifth of rural counties have EPOP ratios below 59 percent, compared to 4 percent of urban counties. For educational attainment, working-age adults in Fifth District rural counties have lower numbers of bachelor's and advanced degree holders than urban counties, and many are without a high school diploma. While employment outcomes of similarly educated populations are widely dispersed, there still appears to be a strong connection between low educational attainment and employment. **EF**



BY JOHN MULLIN

# The Non-Employment Index

Something unusual happened during the economic recovery following the Great Recession. By the end of 2014, the official unemployment rate, as measured by the Bureau of Labor Statistics (BLS), had declined by more than 4 percentage points from its October 2009 recessionary peak of 10 percent. Yet the share of the working-age population that was employed had increased by far less — just under 1 percentage point.

The discrepancy between the two figures raised questions about the official unemployment rate as a measure of labor underutilization. Many economists and other observers suspected that the official calculation was understating the true supply of workers available for hire by excluding many formerly active job seekers who had recently become discouraged.

At the time, Richmond Fed economist Andreas Hornstein was among those who saw problems with the official unemployment rate. Seeking to develop an alternative methodology, Hornstein had conversations with Marianna Kudlyak, then of the Richmond Fed, and Fabian Lange of McGill University. Those conversations led to the introduction of what is now known as the Hornstein-Kudlyak-Lange Non-Employment Index (NEI) in a 2014 Richmond Fed *Economic Quarterly* article, “Measuring Resource Utilization in the Labor Market.”

The NEI departs from the various BLS definitions of labor utilization, which are all based on binary classification schemes in which each working-age person who is not employed is, in effect, either categorized as “in” or “out” of the pool of underutilized workers. For the official unemployment rate, people are considered “in” when they answer “yes” to the questions, “Are you available to take a job?” and “Have you actively sought work in the past four weeks?” Otherwise, they are considered “out.” A broader BLS measure, known as U6, uses a more expansive definition of who is “in” the underutilized labor pool, but the definition is still binary: You are either “in” or “out.”

To Hornstein and his colleagues, the problem with these binary definitions is that, as a practical matter, the distinction between those who are counted as “underutilized” and those who are counted as “out of the labor force” is not usually clear cut; it’s a matter of degree. To reflect this reality, the NEI measures the pool of underutilized workers by weighting each nonemployed, working-aged person according to his or her labor market attachment, which the index associates with the person’s relative probability of finding a job. For example, people who are among the BLS’s “short-term unemployed” category are given weights of

100 percent because that group has the highest historical job-finding rate. People who are among the BLS’s “marginally attached, discouraged” category are given weights of roughly 50 percent because that group’s historical job-finding rate is roughly half that of the “short-term unemployed.” And so on.

The NEI accounts for large swathes of the nonworking population who, despite their exclusion from the ranks of the officially unemployed, have historically contributed significant inflows into the ranks of jobholders. Indeed, during 1994-2013, more people transitioned to jobs from being “out of the labor force” than from being “unemployed.” This outcome reflected the large relative size of the “out of the labor force” group. On average during that period, 4 percent of the U.S. working-age population was included in the workforce as officially unemployed, whereas 34 percent of the working-age population was considered out of the workforce — more than eight times as many.

“It may be more likely for a single person in the unemployed category to become employed,” says Hornstein. “But the group that’s out of the labor force is large, and even when you multiply that large group by a lower job-finding rate, you still get a big number of people finding jobs.”

When the NEI was first published in 2014, it conveyed a somewhat startling message. At the time, it was commonly argued that the BLS’s official unemployment rate had understated the available supply of labor after the Great Recession. Yet the NEI suggested the opposite — that the official unemployment rate had overstated supply. The NEI gave a lower estimate of labor supply because it accounted for the fact that many out-of-work people had transitioned from being short-term unemployed with relatively high labor force attachment to being long-term unemployed with relatively low attachment.

But the period of recovery following the Great Recession appears to have been an anomaly. Since then, the linear relationship between the NEI and the official unemployment rate that existed prior to the Great Recession has been largely reestablished, and the indicators have generally provided similar signals about labor market utilization.

Today, the NEI can be accessed on the Richmond Fed’s website and through the St. Louis Fed’s economic data website, FRED. The indicator is likely to be of particular interest during periods when many people are moving in or out of the officially defined labor force, because the NEI looks past this distinction and looks at the overall supply of people potentially available for work. **EF**

BY TIM SABLİK

## The Fed Is Shrinking Its Balance Sheet. What Does That Mean?

While the Fed has experience buying assets to respond to crises, questions remain around unwinding those actions

**W**hen the COVID-19 pandemic hit the United States in early March 2020, the Fed quickly stepped in to limit the economic fallout. It reduced its interest rate target to near zero and purchased large quantities of U.S. Treasury bonds and mortgage-backed securities (MBS) by injecting reserves into the banking system. As a result of these purchases, the size of the Fed's balance sheet more than doubled from about \$4 trillion prior to the pandemic to nearly \$9 trillion at the start of 2022.

The Fed first engaged in this type of balance sheet expansion, popularly known as quantitative easing (QE), more than a decade ago. It was one of the then-unconventional monetary policy tools the Fed employed in reaction to the Great Recession. With its return during the pandemic, QE seems to have become a more routine part of the Fed's crisis toolkit. But there is still debate among economists over how and how well it works. And when it comes to the reverse process of shrinking the Fed's balance sheet, typically referred to as quantitative tightening (QT), economists know even less.

In response to inflation running well above its long-run target, the Fed began unwinding its accommodative monetary policy this year. This entailed ending QE in March and then beginning QT in June. When QE ended, the Fed reinvested any maturing securities to maintain the size of its balance sheet. With QT, the Fed stopped reinvesting up to \$30 billion in maturing Treasuries and \$17.5 billion in maturing MBS every month, passively

shrinking its assets as those securities "roll off" without being replaced. Those caps are scheduled to rise to \$60 billion and \$35 billion, respectively, in September.

This process is similar to the one the Fed used when it last engaged in QT from 2017 to 2019, albeit at a faster pace. That brief prior period is the only other experience the central bank has had with shrinking its balance sheet, leaving little empirical evidence to draw on when it comes to calculating its effects. At a press conference on May 4 following the Fed's announcement that it would begin QT in June, Fed Chair Jerome Powell offered, "I would just stress how uncertain the effect is of shrinking the balance sheet."

Given this uncertainty, what does the Fed hope to accomplish with QT, what does it want to avoid, and what do economists really know about using the central bank's balance sheet as a policy tool?

### HOW DOES QE WORK?

As with any balance sheet, the Fed's consists of assets on one side and equal liabilities on the other. Before the Great Recession, the Fed's assets were mostly Treasuries, and its liabilities consisted largely of currency in circulation. The size of its balance sheet was also much smaller than it is today, hovering around \$800 billion. Through a series of QE operations from 2008 to 2014, the Fed expanded its balance sheet by purchasing primarily long-term Treasuries and MBS issued by government-sponsored enterprises. (See chart.) On the

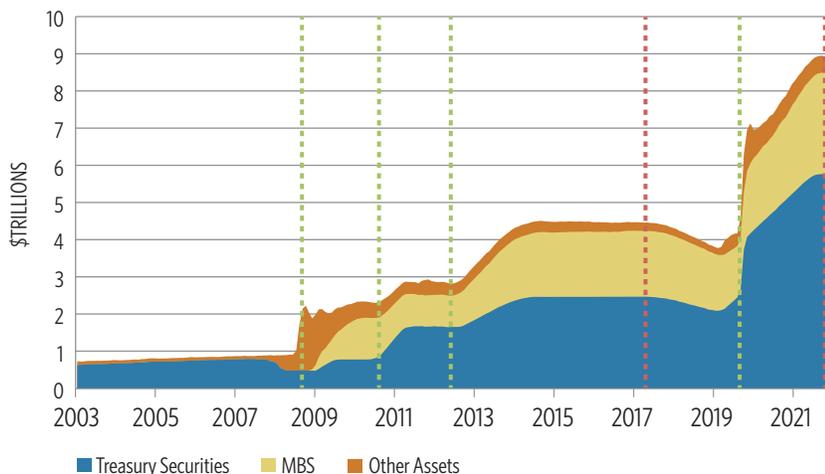
liabilities side, the Fed paid for these purchases mostly through the creation of reserves, which are cash balances that banks hold at the Fed and on which the Fed pays interest.

The Fed's decision to engage in QE during the Great Recession and the COVID-19 crisis stemmed from a desire to provide additional stimulus to the economy after its traditional tool reached its limit. Normally, the Fed provides accommodation by reducing short-term interest rates, which lowers the cost of borrowing and spurs economic activity. But when short-term rates fall near zero, the Fed can't drive them any lower. While some other central banks did experiment with slightly negative rates during the global financial crisis, there is still a limit to how low policymakers can push rates before firms and consumers would choose to switch to cash, which pays an interest rate of zero. (See "Subzero Interest," *Econ Focus*, First Quarter 2016.)

With short-term interest rates as low as they could go, the Fed turned its sights to long-term rates. By buying up long-term assets, the Fed could reduce their supply, increasing their price and lowering their yield (the price and interest rate of bonds are inversely related).

How would this help stimulate the economy? According to some economic models, it shouldn't. Through QE, the Fed primarily swaps one type of government liability (Treasuries) for another (reserves). If financial firms are indifferent about which type of security they hold, then the swap shouldn't matter. This led former Fed

## Evolution of the Fed's Assets



SOURCE: Board of Governors of the Federal Reserve System

NOTE: Green dotted lines denote the start of asset purchases through quantitative easing (QE), red dotted lines denote the start of balance sheet reduction through quantitative tightening (QT).

Chair Ben Bernanke, who oversaw the Fed's initial adoption of QE, to quip, "The problem with QE is it works in practice, but it doesn't work in theory."

Bernanke was being a bit facetious. There are in fact multiple theories of how QE stimulates the economy, although economists disagree about their relative importance. One theory acknowledges that Treasuries and reserves may be imperfect substitutes, both because they have different maturities and because only banks that have accounts with the Fed can hold reserves. Certain financial firms may also strongly prefer to hold long-dated securities. Given the existence of these and other financial frictions, reducing long-term interest rates through QE should stimulate economic activity just as lowering short-term rates does.

QE also provides a signal about future Fed policy. This comes in two flavors, which Williams College professor Kenneth Kuttner described in a 2018 article in the *Journal of Economic Perspectives* as "Delphic" and "Odyssean." According to the Delphic story, QE signals the Fed's forecast that future economic conditions will be

weak, which leads firms and individuals to expect the Fed to keep short-term rates lower for longer. Under the Odyssean version, QE reinforces the Fed's verbal commitment to keep short-term rates lower for longer by tying monetary policymakers to the mast, so to speak. Because the interest the Fed earns on the long-term securities it acquires through QE is largely fixed while the interest it pays on reserves changes with monetary policy, the Fed opens itself up to losses if it were to start raising interest on reserves before reducing the size of its balance sheet. To the extent that Fed policymakers are concerned about such losses, they would seek to unwind QE before raising short-term rates, making the Fed's commitment to keep rates lower for longer more credible.

Lastly, QE can have a positive effect by improving liquidity conditions in financial markets. If the assets the Fed purchases are less liquid than the reserves it exchanges for them, it can help restore healthy market functions and encourage greater bank lending. This effect is likely to be greatest at the height of a crisis, such as in September

2008 following the collapse of Lehman Brothers or in March 2020 at the onset of the pandemic, when financial markets are under the greatest stress.

## WHAT ABOUT QT?

As the comment from Bernanke suggests, the conventional wisdom among economists is that regardless of how it works, QE does have a positive effect on the economy. But just as in the debates over how QE operates, there are a range of estimates of how much difference it makes. Researchers have used economic models to estimate the effects of Fed asset purchases as well as event studies looking at the actual market reaction to each episode of QE. Each approach has pros and cons, and depending on the study, QE was either highly effective or it wasn't.

Still, there are at least multiple episodes of QE available for economists to study to try to tease out its effects. In contrast, the Fed has only attempted QT once before — from October 2017 to September 2019. This makes estimates even more uncertain, as Powell alluded to in his May press conference. A recent study by economists at the Fed Board of Governors estimated that reducing the balance sheet by around \$2.5 trillion over several years would be roughly equivalent to raising the Fed's policy rate by half a percentage point, but the authors stressed that their estimate was "associated with considerable uncertainty."

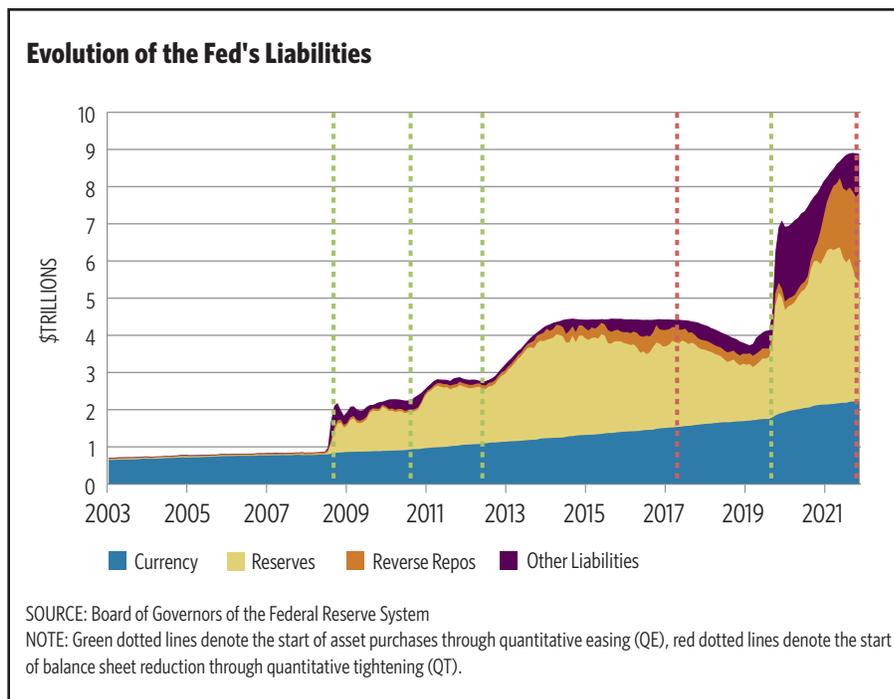
It might be tempting to assume that the effects of QT would simply mirror those of QE, but there are some key differences. In the case of QE, the signaling channel likely plays an important role because the start of QE is usually somewhat of a surprise, albeit a welcome one. Financial crises happen suddenly, so when the Fed has stepped in with QE, it did so swiftly to reassure markets. When it comes to QT, the Fed has instead taken great pains to avoid surprises. It announced its plans for shrinking the balance sheet well in advance,

and the QT process is happening passively following a fixed schedule. In 2017, Philadelphia Fed President Patrick Harker assured markets that QT would be like “watching paint dry.” This cautious approach likely stems, at least in part, from the Fed’s experience during the 2013 “taper tantrum,” when markets reacted strongly to unanticipated comments by then-Chair Bernanke suggesting that the Fed might end QE soon.

Andrew Lee Smith of the Kansas City Fed and Victor Valcarcel of the University of Texas at Dallas compared the effects of QE and QT in a recent working paper. In support of the paint drying metaphor, they found that shrinking the balance sheet did not produce the same “large announcement effects” that accompanied QE. While the Fed is moving more quickly with QT this time, it still took steps to ensure there were no surprises. It presented its initial plans for shrinking its balance sheet in January, added full details of the roll-off schedule in May, and began implementing that plan in June.

“They want to set QT on a fixed course and not have it be the focus of people’s attention, because they want people paying attention to the federal funds rate as the instrument of monetary policy,” says William Nelson, executive vice president and chief economist of the Bank Policy Institute and former deputy director of the Division of Monetary Affairs at the Fed Board. “Of course, even though it’s drying paint, that doesn’t mean it’s not imparting some restraint on the economy.”

While the signaling effects of QT may be weaker, Smith and Valcarcel found that the liquidity effects were roughly double those experienced under QE. As the Fed allows maturing securities to fall off the asset side of its balance sheet, it shrinks reserves on the liability side by an equivalent amount. At the same time, because the Fed is no longer purchasing Treasuries and agency MBS, private markets need to absorb more of those assets. This can result in



some volatility as investors adjust.

This tightening through the liquidity channel may not show up immediately. In a 2017 policy paper, Falk Bräuning of the Boston Fed estimated that the magnitude of the liquidity effect from QT depends on the total quantity of reserves in circulation. When the Fed first begins to shrink its balance sheet, reserves will still be well above what banks require. But as the total supply of reserves shrinks, each additional dollar of reserves drained will have a greater effect on interest rates.

#### WHY SHRINK THE BALANCE SHEET?

Given the uncertainties surrounding the effects of QT and the potential for market disruptions as the Fed tries to zero in on the right level of reserves, why shrink the balance sheet at all? Most policymakers and economists expect that QT will provide some additional monetary tightening, which should help the Fed achieve its goal of getting inflation back down to its 2 percent target. But in principle, the Fed could achieve such tightening through interest rate policy alone. Unlike in the

case of lowering rates during a downturn, the Fed faces no limit on how high it can raise rates. At first glance, then, using balance sheet policy to tighten seems unnecessary.

But there are other rationales for engaging in QT besides monetary tightening. One motivation relates to the “Odyssean” signaling theory of how QE works. By purchasing longer-term assets, the Fed opens itself up to interest rate risk. When it raises the interest it pays on reserves as part of tightening monetary policy, the Fed risks having to pay out more on its liabilities than it earns on its assets because rates on its liabilities will be rising while rates on its assets remain largely fixed. (See chart.)

“In the old days, the Fed operated with a balance sheet that was pretty small and its main liability was currency, which it pays no interest on at all,” says William English, a professor of finance at Yale University and former director of the Division of Monetary Affairs and secretary to the Federal Open Market Committee at the Fed Board. “So, the Fed made money no matter what. Now there is more of a risk that if the Fed has to raise rates

fast during a tightening cycle, it will end up having a loss.”

As English and Donald Kohn of the Brookings Institution noted in a recent Brookings blog post, balance sheet losses don't affect the Fed in the same way they would a commercial bank. The Fed cannot default or go bankrupt because it can always create reserves to cover its losses. Most of the time, the Fed's earnings on its balance sheet are positive, and it remits any profits above its operating costs back to the Treasury. In the case of a loss, the Fed would halt its remittances to the Treasury until it had offset its losses with subsequent profits. As long as the Fed's future earnings remain positive, temporary losses pose no issue for its operations, though if the Fed were to suffer protracted and large enough losses, it could require fiscal support from the Treasury to continue implementing monetary policy. Even short of that worst-case scenario, English and Kohn note that temporary losses could still raise political scrutiny from Congress that the Fed might prefer to avoid.

Shrinking the balance sheet reduces the Fed's exposure to those kinds of losses. A 2019 *International Journal of Central Banking* article by economists from across the Federal Reserve System and Barclays estimated that reducing the amount of reserves on the Fed's balance sheet from \$2.3 trillion

(roughly the amount it held at the start of the first QT in 2017) to \$1 trillion would reduce the chances of recording a quarterly loss from 30 percent to less than 5 percent.

Another reason for shrinking the balance sheet has to do with the composition of the Fed's assets. The Fed has \$2.7 trillion in MBS, but in its plan for reducing the balance sheet, released in January, it expressed a desire to hold primarily Treasuries in the long run. Buying non-Treasuries affects the allocation of credit to different sectors of the economy, and several policymakers and economists have argued such policy decisions should be made by Congress or the Treasury Department, not the Fed. Getting to a Treasuries-only balance sheet on the Fed's current plan could be a long road, however. As mortgage rates rise, fewer homeowners will refinance their loans, slowing the rate at which MBS held by the Fed mature and roll off its balance sheet. In a May speech, Cleveland Fed President Loretta Mester noted that the Fed could speed up this process by actively selling some of its MBS, but that might also open the central bank up to greater losses.

### RELOADING FOR THE NEXT CRISIS

A final reason for engaging in QT is to free up capacity for a future QE. If the

Fed's balance sheet were to continue to grow, it could, in theory, run out of Treasuries or other acceptable assets to purchase to conduct QE in the future.

Former Richmond Fed President J. Alfred Broaddus Jr. and policy advisor Marvin Goodfriend confronted this issue under very different circumstances in a 2001 Richmond Fed *Economic Quarterly* article. At that time, the federal government was enjoying a budget surplus, and Broaddus and Goodfriend were concerned that the Treasuries market could dry up if the United States were to pay down its debt. While that didn't come to pass (and indeed seems difficult to imagine today), the Fed could still face the same problem if its asset purchases were to outpace the supply of Treasuries. Additionally, an ever-increasing balance sheet would expose the Fed to even larger losses in a tightening cycle.

“The Fed would rather not have this ratchet effect where the balance sheet just keeps getting bigger, because at some point, you have a problem,” says English. “I think they want to be clear that this is a counter-cyclical policy that they'll engage in to provide support when it's necessary, and they'll unwind when it's appropriate to do so.” **EF**

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BY MATTHEW  
WELLS

# PAID TO RELOCATE

States and communities are looking for remote workers as sources of economic growth. Is offering them cash and other perks a promising model of economic development?

**M**aggie Blume first learned about Ascend West Virginia on Instagram, where she saw a list of cities and states around the country promising money and other benefits to attract workers. A small business marketing executive from Chicago and a remote worker herself, Blume had already been considering applying for some of the other programs on the list. She says, however, “I really was waiting for something that caught my eye.” Drawn by the outdoors and her fond memories of visiting West Virginia as a child, Blume applied for Ascend’s second cohort, which would be centered in rural Lewisburg (population roughly 3,900) and the Greenbrier Valley, not far from the Virginia border.

After a review of her online application and two interviews over Zoom, Blume was notified she had been accepted, one of 33 out of over 3,600 applicants. Within weeks, she had found an apartment and was ready to move and enjoy all that West Virginia has to offer. “I’m a flatlander from the Midwest,” says Blume, who moved to Lewisburg in March, “so seeing mountains and being able to kayak and things like that have been so much fun.”

West Virginia is one of a growing number of states and communities across the country looking to revive their economies after years of

“I’m a flatlander from the Midwest,” says Maggie Blume, a member of Ascend West Virginia’s second cohort, “so seeing mountains and being able to kayak and things like that have been so much fun.”

declining populations by enticing people who are looking for a change of pace in their own lives. MakeMyMove.com, an online clearinghouse for such programs, currently lists more than 70 different locations of varying sizes around the country offering a number of incentives, including cash, aimed at encouraging people to start anew in smaller, less high-profile communities that they otherwise might not have considered.

Ascend, for example, offers \$12,000 paid across two years, one year of free access to all of West Virginia's outdoor activities, including whitewater rafting and downhill skiing, and coworking space, among other things. In addition to Blume's 33-person cohort in Lewisburg and the Greenbrier Valley, the first cohort of 53 newcomers is centered in Morgantown, a city of almost 31,000 and the home of West Virginia University. Ascend, which is funded through the philanthropy of businessman and West Virginia native Brad Smith and his wife, Alys, is currently accepting applications for new cohorts in these areas, as well as the Eastern Panhandle, with the ultimate goal of bringing 1,000 remote workers to five regions throughout the state.

Most of the programs like Ascend are focusing their efforts on remote workers — workers who can do all their work outside of an office. The notion of remote work predates the COVID-19 pandemic, but it has spread to the point where over two-fifths of all paid full workdays in the United States were worked at home over the past two years. It is difficult to tell just how many workers will remain fully remote as time goes on, but they are considered desirable targets: In addition to being able to work from anywhere, remote workers also tend to be more educated and work in higher-earning sectors such as finance, management, and information technology.

This combination of geographic flexibility, advanced education, and higher earnings leads Smith, who is also the president of Marshall University in Huntington, to suggest that these workers will “help us get our community stronger, do their jobs, spend in our local small businesses, come up with new ideas, and strengthen our state and our economy.” Once settled, Smith notes, the new residents “will share their experiences with their friends and fellow employees and that often attracts companies to say, ‘I want to go where the talent is or where the talent wants to live.’”

Given the rising popularity of remote work and these initiatives to attract them, are we witnessing a new model of economic development?

## **A LEGACY OF ENCOURAGING MOVEMENT**

The United States has a long history of offering people incentives to relocate to areas deemed in need of growth. Perhaps the most ambitious and sweeping of these efforts was the Homestead Act, which President Abraham Lincoln signed into law in 1862. To encourage the settlement of the American West with U.S. citizens, the federal government gave 160 acres to any adult at least 21 years old willing to pay a small filing fee, build a house on the property, and develop and farm it for at least five years. Because any adult or head

**The notion of remote work predates the COVID-19 pandemic, but it has spread to the point where over two-fifths of all paid full workdays in the United States were worked at home over the past two years.**

of household who could pay the fee qualified for the program, many immigrants, single women, former slaves, and farmers without any previous land of their own would participate. Almost four million settlers claimed 270 million acres across 30 states in the 123 years when the law was in effect.

More recently, since the 1970s, the federal National Health Service Corps and state programs have used scholarships and repayment of student loans to encourage doctors and other health care workers to work in designated areas, many of them rural.

While the new generation of relocation incentive programs are far more modest and local in scope, they share the Homestead Act's goal of encouraging growth. For example, to boost their declining populations, several small communities throughout Midwestern states such as Iowa, Nebraska, and Kansas offer much smaller plots of land in both suburban and rural areas to qualified applicants who are then required to build a new home on the property.

Instead of offering land, however, most current programs offer cash and other professional and personal incentives such as mortgage assistance, coworking space, and tickets to museums and concerts. The value of the incentive package can vary: Jasper, Indiana's offer totals about \$5,500, for example, while Greater Rochester, New York's comes to \$19,000.

Two such efforts that predate the pandemic are Tulsa Remote and Vermont's New Relocating Employee Incentives Program, originally called the New Remote Worker Grant Program. Founded in 2018 and funded by the George Kaiser Family Foundation, Tulsa Remote has recruited nearly 1,700 remote workers from outside Oklahoma to make Tulsa their home. It shares many of the same goals as Ascend West Virginia: attract skilled workers to provide a stronger economic base for the community and raise the profile of Tulsa as a prime destination to live and work. The program offers selected participants \$10,000, as well as coworking space and networking and housing assistance. Along with these incentives, Tulsa Remote highlights to potential applicants the city's tightknit community feel, as well as its extensive outdoor activities, nightlife, and nationally recognized restaurants.

Vermont also began its efforts in 2018, establishing a \$500,000 grant program funded through the state budget. In the first year, the initiative provided \$10,000 to remote workers who chose to relocate to the Green Mountain State. The overall budget for the program in 2021 was \$610,000 and provided grants of up to \$5,000, although grants for individuals choosing to relocate to economically distressed areas of the state

**Program participants make economic contributions to their new communities, whether through dining out, engaging in recreational opportunities, or buying and maintaining a home. Questions remain, however, as skeptics argue that not only is it difficult to accurately measure these contributions, but also there is evidence that at least some participants would have moved to these areas even without being a part of any incentive program.**

went up to \$7,500. In addition to the financial incentives, the state has set up 30 coworking and makerspace (that is, space for making products) locations for these remote workers. Vermont's program, however, is not just restricted to remote workers. To address the shortage of workers available for the state's existing industries, it invites those looking for traditional work opportunities to apply for these grants, as well, and gives them access to a statewide employment database that allows them to search jobs by industry, desired location, and education level, among other things. Beyond the financial incentives, Vermont's marketing campaign touts the state's peaceful, bucolic reputation, safe communities, and friendly small towns, targeting those who might wish for a slower pace of life than what they might experience in larger cities.

## DEFINING SUCCESS

Danny Twilley is the assistant vice president of economic, community and asset development for the Brad and Alys Smith Outdoor Economic Development Collaborative at West Virginia University and one of the primary architects of the Ascend program. When asked how he would define success, Twilley says that the initiative has focused on retention — that participants will stay in West Virginia beyond their initial two-year commitment to the program. The current hope is that 50 percent of Ascenders will remain for a third year, although Twilley adds that because “we’re building this program around community purpose and the outdoors,” he’s optimistic that number will be closer to 75 percent.

By providing intensive outdoor recreation experiences such as river rafting and skiing excursions, as well as more casual events like happy hours and backyard barbecues, Ascenders will have ample opportunities to create both friendships and an attachment to their new environment that will lead them to remain in West Virginia. Life changes can force people to move, however, so Twilley also anticipates that even if participants ultimately leave the state, they will become vocal ambassadors committed to “that positive

branding of West Virginia, putting it in a different light than what it has been historically,” convincing others to visit and possibly even consider making West Virginia home as well.

In addition to changing West Virginia's reputation and keeping people in the communities they have come to call home, the program also tracks a more traditional metric of success, namely, the program's contributions to the economies of their communities. According to Twilley, Ascend projects that in the program's first two years, participants will directly and indirectly create a total of \$124 million in economic activity and 404 new jobs in the Morgantown area, the Greenbrier Valley, and the Eastern Panhandle. If it meets its 50 percent retention goal in its third year, those numbers are projected to grow to a total of \$182 million and 594 jobs.

The Tulsa and Vermont programs also report significant positive economic effects. A November 2021 impact assessment estimated that in that year, Tulsa Remote participants added \$62 million in new local earnings statewide, \$51.3 million of which is attributable to the participants themselves. The study also claims that the program led to the creation of 592 new jobs in 2021, which translates to about one new job in Tulsa for every two remote workers who moved to the city.

Similarly, a December 2021 report on Vermont's program also identified gains to that state's economy. It estimated that the 307 participants across the 2018 and 2019 budget cycles helped create 115 new jobs, \$5.6 million in wages, and \$17.1 million in economic impact. It also estimated that these new Vermonters paid approximately \$946,000 in taxes to the state, and that every tax dollar appropriated to the program in 2018 and 2019 generated \$93.88 and \$66.26, respectively, in economic activity.

## SKEPTICAL OF SUCCESS

Program participants make economic contributions to their new communities, whether through dining out, engaging in recreational opportunities, or buying and maintaining a home. Questions remain, however, as skeptics argue that not only is it difficult to accurately measure these contributions, but also there is evidence that at least some participants would have moved to these areas even without being a part of any incentive program. Additionally, it is unclear whether such place-based initiatives are suited only to particular types of communities, or if they can be successfully replicated across a range of places.

Brett Theodos, a senior fellow at the Urban Institute, suggests that accurately capturing the contributions of these remote workers is possible, but it requires comparing the communities where incentives are present with demographically, economically, and geographically similar communities where they are not. What are needed, Theodos argues, are empirical studies comparing “how communities do economically that have these incentives versus those that don't.” The assessments of the Tulsa and Vermont programs rely on analyses that capture projected changes in those regions' economies over time, but it

is difficult to attribute those changes specifically to the economic activity of the programs' participants, rather than some other unaccounted-for factor. By comparing across a range of similar communities, however, those other factors can be taken into account, allowing for better, although still imperfect, identification of the incentive program's effect.

Relatedly, these contributions need to be large enough to be detected. "If we pour a teaspoon of boiling water into a large pot, does it affect the temperature of the pot in a way that we can measure and detect? No," says Theodos. "But if we pour a gallon of boiling water into that pot, yes, we know we've affected that temperature."

Vermont's economic impact assessment acknowledged this constraint, stating that because its programs have fewer than 500 participants, they have "limited ability to 'move the needle'" on some of the state's major policy objectives, including improving economically distressed areas of the state.

Richmond Fed economist Santiago Pinto suggests that for these programs to really succeed in jump-starting the kinds of economic revitalization their planners envision, they need to attract enough participants to the point where the incentives are no longer necessary. "From that point onwards," Pinto notes, "they would simply benefit from the local benefits generated by more people residing in the area," known as agglomeration effects. Unfortunately, it is difficult for states like Vermont and West Virginia to know just how large the program needs to be to capture those benefits. For Tulsa Remote, the problem is potentially the opposite, as it is already a city of over 400,000 residents, raising the possibility that it already has reached that level, making the program inefficient and ineffective.

Local programs competing for remote workers may also be subject to an additional hazard that confronts state and local development programs competing to attract businesses. When these communities compete for a mobile factor of production — in this case, labor — they may tend to offer excessively high levels of incentives compared to situations in which they could coordinate and make decisions in a centralized fashion.

Another complication in the effort to determine the effect of these programs is the possibility that participants are moving not because of the incentives, but for some other reason. If potential participants are drawn to apply for the program because they are originally from the state and want to return home, they have family there, or spent significant time there previously, it becomes difficult to isolate the role of the incentive program in their decisionmaking. Of the 53 members of Ascend's first cohort who moved to the Morgantown area, 23 percent are native West Virginians, and in the Greenbrier Valley cohort of 33 members, 15 percent were born in the state. Others, like Blume, who as

a child used to attend the annual Clifftop Music Festival (now known as the Appalachian String Band Music Festival) not far from her new home in Lewisburg, have some other preexisting attachment to the state. Vermont's impact assessment noted this difficulty as well, stating that about half of the program's participants were motivated by the financial incentives that averaged less than \$5,000, with multiple people describing it as the "icing on the cake." Still, even if the incentives are not the primary drivers of the decision to move, the programs may be important because they may tip the balance for someone or simply signal that the locations would be welcoming to newcomers.

## MORE TO IT THAN MONEY?

The developers of these initiatives are seeking to leverage whatever endowments either already exist or can be developed in their states and cities to build those communities and ultimately drive growth. Twilley, the Ascend architect, notes that this model is quite different than efforts to lure large employers with tax breaks. "We're doing it in a much different way," he says. Instead, he is aiming to foster communities with shared values. In the Morgantown area, for example, the focus is on developing a community that values access to the outdoors. "We have a goal to have a trail within a mile of every house within the city limits. Who can say that? Very few places," states Twilley. "That sort of thing differentiates us over the long term from other areas and states."

These nonmonetary attractions are what potential residents of West Virginia, Vermont, and Tulsa find so enticing, perhaps as much or more than the financial incentives. Most of them are higher-income earners for whom several thousand dollars spread out over a year or two is not enough to drive the decision to move. Instead, most are looking for an opportunity to pursue interests, whether it be plentiful outdoor activities or an active food and music scene. When asked if she would have moved to West Virginia even if she hadn't been selected, Blume thinks she probably would have. "A big part of me moving was to find a community of like-minded people," Blume says.

Will communities of remote workers like Maggie Blume help bring these cities and towns in need of revitalization back to life? If the groups of people that move to these areas are committed to maintaining an active and thriving music or food scene, or continuously demand outdoor experiences, will that be enough to revitalize these communities that have suffered from decades of disinvestment? There is a lot riding on the success of these initiatives, as the contributions of their participants could make a difference in everything from school funding to voting power in state and national legislatures to the economic survival of the communities that have welcomed them. **EF**

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BY CHRIS MURPHY

## The Reserve Bank Presidential Search

The public-private governance structure of the Fed was designed to keep it apolitical and independent, yet accountable to Congress, to ensure it could operate most effectively as the nation's central bank. For the past several decades, Congress and the Fed have instituted policies seeking to make the Fed more transparent to the public without eroding its independence.

An example of increasing transparency is how the Fed selects Reserve Bank presidents. Each of the 12 Reserve Bank presidents oversee their Banks' monetary policy, bank supervision, and payment services. In addition, they gather economic intelligence through their respective boards of directors, advisory councils, and business and community leaders to inform their policy perspectives on the Federal Open Market Committee (FOMC), the body that conducts U.S. monetary policy. Based on the critical role that presidents play in formulating monetary policy, members of Congress called for more transparency in the selection of presidents to ensure the monetary policy process includes diverse views and experiences. This led the Fed to take steps to ensure its presidential selection process was transparent, fair, and inclusive.

One such response has been an effort to increase the diversity of the people who serve on each Reserve Bank's board of directors. By statute, the selection of a Reserve Bank president is the responsibility of its board. Across the Federal Reserve System, there are 274 slots for directors on head office and branch boards. As of Jan. 1, 2022, Reserve Bank boards comprised 43 percent women, compared to 36 percent five years ago, and 38 percent minorities, compared to 30 percent 5 years ago. In addition, industry diversity includes representatives from commerce/industry (25 percent), banking (24 percent),

consumer/community (9 percent), and labor (2 percent), to highlight a few. Board diversity directly influences the presidential search process by ensuring a broad and diverse candidate pool.

Directors are comprised of three classes – Class A directors are elected by and represent member banks in the Reserve Bank's district, Class B directors are elected by member banks but represent the public, and Class C directors are appointed by the Fed's Board of Governors to represent the public. When a presidential search begins, the directors form a search committee, composed of Class B and C directors, that may hire an executive search firm capable of sourcing a broad pool of highly qualified and diverse candidates. Class A directors are prohibited from taking part in the search process because of their connection to financial institutions. Among other qualities, Reserve Banks seek candidates who can interpret and communicate on a broad range of economic and banking policy topics, direct the focus of the Bank's economic research, provide input to FOMC deliberations, and possess the ability to serve as a chief executive officer for Reserve Bank operations.

"The vetting and interview process is a collaborative effort that includes representatives from the search firm, the search committee, additional Bank directors who represent the public, and members of the Board of Governors," Margaret Lewis, former board chair of the Richmond Fed, told Congress. "The diversity of perspectives offered from these reviews contribute significantly to ensuring candidates are qualified in accordance with the job profile and evaluated on their professional experience, competencies and characteristics, and adherence to the highest ethical standards."

Reserve Banks have implemented various practices, such as establishing a

dedicated public webpage that includes a job profile, a process for allowing the public to submit candidate referrals, and public updates throughout the selection process. Reserve Banks reach out to the public through town halls and meetings to share information, encourage individuals and organizations to provide input, and answer questions. Engagement includes stakeholders from labor, business, nonprofits, academia, and organizations whose missions include a focus on diversity and inclusion, among others.

The chair of the Board of Governors' Committee on Federal Reserve Bank Affairs meets regularly with the search committee chair throughout the process regarding the candidate pool, with a particular focus on ensuring it is broad and diverse. During the Richmond Fed's 2017 presidential search, the search committee provided Congress with updates on the process.

After the search committee interviews a range of potential candidates, final candidates are interviewed by the Board of Governors. The Bank's Class B and C directors then formally appoint a candidate, subject to the approval of the Board of Governors.

Former Richmond Fed economist Marvin Goodfriend described in a 2000 essay, "The Role of a Regional Bank in a System of Central Banks," what he viewed as the many advantages of the Fed's decentralized structure. His reflections included the importance of Reserve Bank presidents in helping to bring information about local economies and business decisions to FOMC meetings and using that information to contribute to policymaking. In turn, presidents help get the Fed's policy message out to the public. Many policymakers inside and outside of Congress believe that a transparent and inclusive search process will aid both of these functions. **EF**

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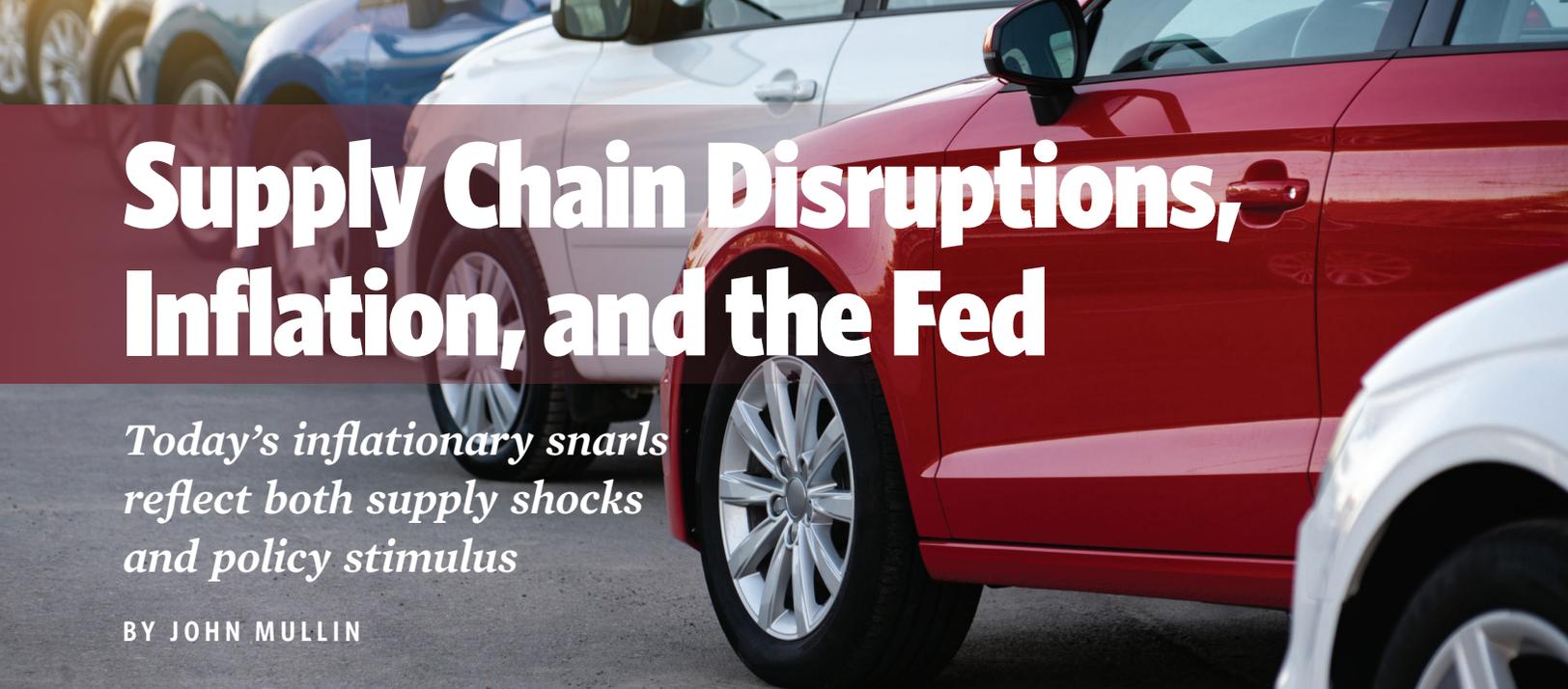
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# Supply Chain Disruptions, Inflation, and the Fed

*Today's inflationary snarls reflect both supply shocks and policy stimulus*

BY JOHN MULLIN

Used cars became a hot commodity during the pandemic, with their prices increasing by roughly 50 percent between January 2020 and December 2021. The spike in used car prices was a prominent example of how global supply chain disruptions have contributed to U.S. inflation. It also highlighted the complexity of global supply and demand relationships.

In the early stages of the COVID-19 pandemic, many U.S. and European auto manufacturers shut down production to help stop the disease's spread. Semiconductor producers, concentrated in Asia, responded by shifting production toward chips for electronic devices such as computers and games. As the pandemic progressed, demand increased in these other markets as homebound consumers shifted their spending away from services such as restaurant meals and travel and toward consumer durables.

Later in 2020, when U.S. auto manufacturers resumed production, they faced chip supply shortages. The shortages not only reflected pandemic-related production shutdowns in Asia, they also reflected a reluctance on the part of chip manufacturers to shift production back to chips used in auto production and away from the relatively lucrative market for chips used in electronic devices.

The diminished supply of new cars in the U.S. market provided support for higher used car prices. (See chart.) Since used cars comprise roughly 4 percent of the basket that makes up the consumer price index (CPI), the 50 percent cumulative price increase for the category increased the overall CPI by a cumulative 2 percentage points. According to an analysis by Richmond Fed economist Alex Wolman, the increase in motor vehicle prices ranked as one of the "main culprits" of the U.S. inflationary increase through November 2021.

The used car example illustrates the limited ability of monetary policy to control inflation's short-run trajectory. "It's true that inflation is a monetary phenomenon, in the sense that monetary policy has the ability to control inflation over the medium to long run," says Wolman. "However, even when monetary policy is being successful at controlling inflation, unusual shocks to supply and demand for

particular goods and services move inflation around from month to month."

The U.S. economy has indeed faced a string of unusual supply and demand shocks since the pandemic's onset — most of which have tended to boost inflation. But this fact does not necessarily let the Fed off the hook.

## A MIX OF SUPPLY AND DEMAND SHOCKS

Since the onset of the pandemic, the U.S. economy has been hit by a series of supply and demand shocks. The first of these, of course, was the pandemic itself. Several early analyses of the pandemic characterized it as a combined supply-demand shock. For example, an NBER working paper in February by Martin Eichenbaum of Northwestern University, Sergio Rebelo of Northwestern University's Kellogg School of Management, and Mathias Trabandt of Goethe University Frankfurt presented a model of epidemics in which COVID-19 "acts like a negative shock to the demand for consumption and the supply of labor."

The view of the pandemic as a combination of negative supply and demand shocks found support in the data. For instance, a 2020 paper by Geert Bekaert of Columbia University, Eric Engstrom of the Fed Board of Governors, and Andrey Ermolov of Fordham University employed statistical methods to "extract aggregate demand and supply shocks for the US economy" during the early stages of the pandemic. The paper estimated that negative aggregate supply and demand shocks both contributed substantially to the initial output decline in 2020.

During the initial stages of the pandemic, there was much concern among economists and policymakers that the pandemic's initial negative effect on aggregate demand could be exacerbated by job destruction and firm closures. This concern was reflected in an *American Economic Review* article by Veronica Guerrieri of the University of Chicago's Booth School of Business, Guido Lorenzoni of Northwestern University, Ludwig Straub of Harvard University, and Iván Werning of Massachusetts Institute of Technology, which presented "a theory of Keynesian supply shocks: supply

shocks that trigger changes in aggregate demand larger than the shocks themselves.” Their preferred policy responses included many of the measures implemented by U.S. policymakers, such as emergency loans, enhanced social insurance payments, and accommodative monetary policy.

It did not take long for these measures to show results. One of their initial effects was to boost the U.S. personal savings rate. Bank accounts grew rapidly during 2020 as people received stimulus payments from the Internal Revenue Service and enhanced unemployment insurance checks — some received more from these benefits than they had been earning from their former jobs — while drastically reducing their spending on dining, entertainment, and travel. Flush with cash, many consumers quickly started to buy consumer durables.

“There was a huge surge in consumer goods demand, because households were simply unable to spend their cash on going out for a meal or going to the cinema or going on holiday,” says Christopher Williamson, chief business economist at IHS Markit, a provider of data and research affiliated with S&P Global. “So, a whole lot of us spent a lot of time ordering new computers, furniture, and bicycles.”

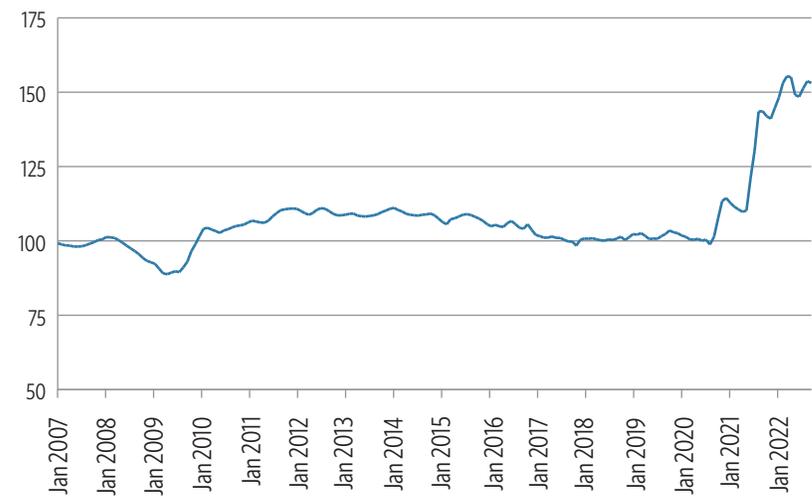
In retrospect, there is a broad consensus among economists and policymakers that the combination of increased fiscal spending and an aggressively accommodative monetary policy ultimately overshoot the mark by providing excessive economic stimulus. To the extent that they did, the policies arguably constituted a second major shock to the U.S. economy. The Russian invasion of Ukraine in February of this year imposed a third major shock by restricting global oil and grain supplies, causing spikes in the two commodities’ prices, which had been already increasing since mid-2020. The combination of the three shocks — the pandemic, the expansionary policy overshoot, and war — left analysts with a hard-to-identify stew in which pandemic-related foreign plant closures, heightened consumer durables demand, and increased global commodity prices have put tremendous strains on global supply networks.

## SUPPLY CHAIN DISRUPTIONS

There is no precedent in recent history for the supply chain disruptions that currently afflict the global economy. The scope of the problem is seen, among other places, in

### Used Cars Become Hot Commodities

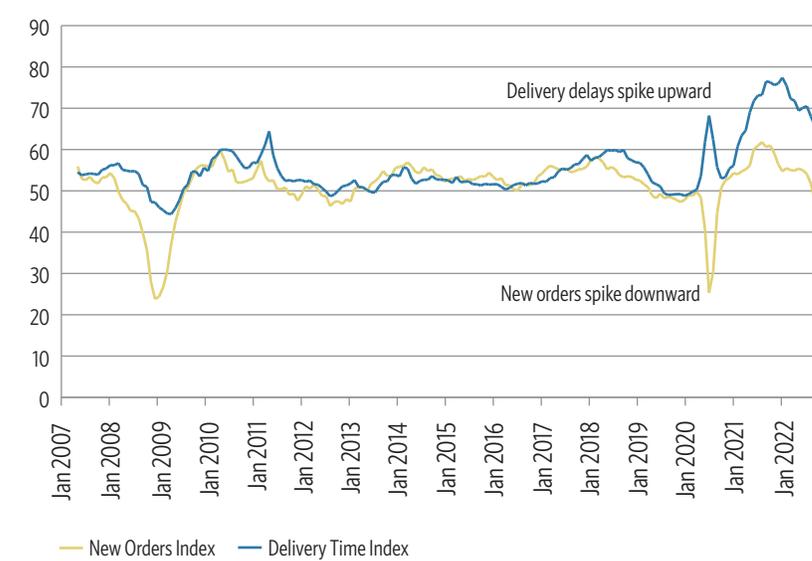
Consumer Price Index for Used Cars and Trucks (Rebased, December 2006 = 100)



SOURCE: Bureau of Labor Statistics via FRED

### Unprecedented Delivery Delays

JPMorgan Purchasing Managers Indices: Delivery Time Index and New Orders Index



SOURCE: S&P Global

the recent behavior of the JPMorgan Global Purchasing Managers Indices (PMI) delivery time index, which provides a measure of delivery delays around the globe. Ordinarily, the delivery index tends to closely track the JPMorgan PMI new orders index. For example, when the new orders index declined during the 2008-2009 recession, the delivery index declined as well; and when the new orders index subsequently recovered, the delivery index followed suit. This positive correlation is just what one would expect for economic cycles that are driven primarily by fluctuations in aggregate demand: Weak demand means shorter waiting times; strong demand means longer waiting times. (See chart.)



In contrast, the two indexes moved in dramatically divergent directions at the onset of the pandemic. The new orders index plunged, signaling a collapse in aggregate demand, but the delivery time index spiked upward. This negative correlation is just what one would expect for an economic cycle driven by a combination of negative supply and demand shocks.

Supply disruptions (as reflected in the delivery time index) became even more pronounced as aggregate demand (as reflected in the new orders index) recovered. The new orders index peaked in mid-2021, and subsequently declined. Nevertheless, the delivery time index has remained near its historical peak, signaling continued supply problems.

Global companies reported reduced production due to staff shortages that peaked during each of the pandemic's various waves, according to data from S&P Global. Each wave of staff shortages gave rise to a follow-on wave of materials shortages.

Transportation snarls exacerbated the problems caused by plant closures, further disrupting global supply chains. "There were a lot of port closures — notably in China," says Williamson. "With restrictions heavily in place, the ports just couldn't function as efficiently as they could before. And it's not just ships going into ports, but trucks bringing containers in and out of the ports. A lot of containers ended up in the wrong places. It produced unprecedented congestion."

By late 2021, shipping a container through U.S. ports took more than three times longer than it normally did. The congestion at Chinese ports only worsened recently due to COVID-19 lockdowns in Shanghai and other ports. Shipping costs have remained elevated, and port congestion has had numerous effects that may have been hard to predict. California farmers, for instance, have been having a difficult time finding container capacity to export tree nuts, produce, and dairy products.

Of all the supply problems that have arisen during the pandemic, semiconductor shortages have had some of the most widespread effects. In many cases, semiconductors account for only a small part of a product's total cost. Yet they often have no close substitutes, making them indispensable to the production process. Because of this, semiconductor shortages can have an outsized effect on final-product supply shortages and the inflationary pressures they create. Recent research by economists at the St. Louis Fed indicated that the problem extended far beyond the auto industry to a broad range of other U.S. manufacturing industries. Comparing 56 industries that use semiconductors as a direct input with 170 industries that do not, they found substantially higher price changes in the semiconductor-dependent industries during 2021.

Additional research from the St. Louis Fed shows that price pressures tended to be greatest in U.S. industries with heightened exposure to foreign countries experiencing particularly severe supply bottlenecks, as measured by indexes of work backlogs and supplier delivery times. Some of the largest exposures were in the U.S. motor vehicles, petroleum, basic metals, and electrical equipment industries.

## HOW MUCH INFLATION CAME FROM WHERE?

A natural question is the extent to which increased inflation is due to overly accommodative macroeconomic policies versus the supply-side shocks caused by the COVID-19 pandemic and, more recently, the war in Ukraine. The multiplicity of shocks and their staggered arrival times make this a difficult question to answer definitively.

Researchers have responded to the challenge by taking a variety of approaches. One such effort was undertaken by the Richmond Fed's Alex Wolman in a recent working paper, "Relative Price Shocks and Inflation," which he co-authored with Francisco Ruge-Murcia of McGill University. Within the context of a more general analysis of the relationship between relative price shocks and inflation, the researchers presented a model that they used to break down the behavior of U.S. inflation from March 2021 through November 2021 into contributions from supply-side shocks versus overly accommodative monetary policy.

In the model, the monetary authorities do not attempt to stabilize the prices of individual goods and services, nor do they attempt to constrain overall inflation to an extremely narrow range in the short run. "If the relative price of used cars needs to go sky high because of supply disruptions, the way that's going to happen at first is for the prices of used cars to go sky high," says Wolman. "It's not going to happen by having the prices of all of the other goods in the economy decline all at once." Thus, sector-specific supply shocks can affect the economy-wide rate of inflation on a month-by-month basis, even under a monetary regime marked by low inflation and policy stability.

Over the model's long-term horizon, however, monetary policy does stabilize inflation. Although the central bank allows unusually large relative price shocks to pass through to inflation, those shocks are — by definition — unusual, so inflation tends to remain close to the Fed's target.

Wolman and Ruge-Murcia found that the inflationary increase during the period between March 2020 and November 2021 was roughly four-fifths due to supply-side shocks, with the single largest supply-side shock coming from the vehicle sector. Overly accommodative monetary policy explained the remaining one-fifth of the inflation overshoot. Although the model does not explicitly incorporate fiscal policy, Wolman believes that, in practice, their calculation of monetary policy's contribution to inflation most likely captures the combined inflationary contributions of both monetary *and* fiscal policy. "My view is that there was a big expansionary fiscal shock, and that if the Fed had followed its usual policy rule, it would have chosen a much higher interest rate than it actually did," says Wolman. "To the extent that the Fed did not raise rates in response to the fiscal stimulus, it's going to show up in our model as a monetary policy shock."

Recent research by economists at the New York Fed broadly concurs with Wolman's finding that the inflationary increase seen during 2021 owed much to supply-side factors



such as production and shipping bottlenecks and higher input prices. They also agreed in the assessment that loose monetary policy played a secondary role, concluding that the global nature of recent supply shocks suggests that “domestic monetary policy actions would have only a limited effect on these sources of inflationary pressures.”

But these two studies come with an important caveat: They only cover the period through late 2021, when U.S. inflation was still behaving much like it had during 1995–2019 — a period of low and stable inflation in which relatively high monthly inflation readings were mostly accounted for by large price increases in a small share of goods and services. More recent data have deviated from this pattern. “Not only has inflation continued to be high,” says Wolman, “it has also been associated with a larger share of goods with large price increases.” To Wolman, this increased inflationary breadth raises concern that inflation may be becoming more of a monetary phenomenon and less a supply-side phenomenon.

Ana Maria Santacreu of the St. Louis Fed has taken a variety of approaches to understanding the recent increase in inflation. “We’ve done a lot of things from different angles,” she says. “There’s no one method that can tell us, ‘how much is demand, and how much is supply?’” While some of her research has pointed to the importance of supply-side factors, she has also found evidence suggesting that expansionary fiscal policies have played an important role. She recently co-authored a working paper that examined recent increases in inflation across a sample of advanced and emerging economies. The researchers found that expansionary fiscal policies tended to increase consumption but had only a limited impact on the supply of goods as measured by industrial production indexes. “We take the results as evidence that fiscal policies contributed to inflationary mismatches between demand and supply,” says Santacreu.

## A MONETARY POLICY CONUNDRUM

Pinning down the precise sources of current inflationary pressure has important implications for policy. To the extent that increased inflation reflects overly stimulative policy, the antidote is apparent: Reverse course and revert to policies more consistent with past periods in which inflation was stabilized. To the extent that increased inflation reflects supply-side shocks, however, the usual tools of aggregate demand management are likely to offer little help.

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In the wake of the global oil price shocks of the 1970s, economists devoted much effort to understanding the optimal monetary policy response to supply shocks. Unfortunately, however, the consensus conclusion was that the standard tools of monetary and fiscal policy are not well designed to address supply shocks. Edward Gramlich of the University of Michigan provided a summary of this viewpoint in a 1979 article that appeared in *Brookings Papers on Economic Activity*. He concluded that supply shocks are very costly, no matter what the policy response: “If their unemployment impact is minimized by accommodating policies, the shock-induced inflation can linger for several years. If their inflationary impact is minimized by an immediate recession, the cost in terms of high unemployment is sizable.”

As a practical matter, economists have often advocated some degree of accommodation in response to aggregate supply shocks. But the prescription for accommodation typically rests on the assumption of an economy initially at equilibrium — that is, one with stable inflation and full employment. While that was likely the case at the onset of the pandemic, it certainly was not the case when global energy and grain supplies were disrupted at the onset of the war in Ukraine. Indeed, year-over-year U.S. inflation had already hit a nearly 40-year record before that point.

While monetary policy is generally not an effective avenue for alleviating supply shocks, companies and governments are likely to take measures designed to soften such blows in the future. Undoubtedly, changing perceptions of risk will cause some firms to reassess their supply chains, just as Japanese automakers did after their supply networks were heavily disrupted by the 2011 Tōhoku earthquake. Indeed, even before the pandemic, many companies had been already reassessing their reliance on foreign value chains, due to, among other things, increased labor costs in China and the growing importance of “speed-to-market” as a competitive factor.

Calls for government policies to decrease dependency on global supply chains have come from many circles in the United States, Europe, and Japan. Treasury Secretary Janet Yellen, for example, has raised the prospect of “friend-shoring” policies. Similarly, officials from France and Germany have spoken of “reshoring projects” and “minimizing one-sided dependencies.” Within the United States, the costs and benefits of such policies will continue to be debated among researchers and politicians, while Fed officials focus on the appropriate extent of monetary tightening or accommodation. **EF**

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BY ABHIMANYU BANERJEE

# Measuring Employers' Market Power

Chen Yeh, Claudia Macaluso, and Brad Hershbein. "Monopsony in the U.S. Labor Market." *American Economic Review*, July 2022, vol. 112, no. 7, pp. 2099-2138.

**H**ow competitive is the U.S. labor market? Is it highly competitive with few to no distortions, or do a few firms hold dominant market power? Answering this question quantitatively is helpful for understanding how wages are affected by labor market power, and thus for understanding how workers will be affected by labor policy choices.

In a perfectly competitive labor market, a worker receives his or her marginal revenue product, which is the additional revenue that the worker provides to the firm. On the other hand, when the firm enjoys monopsony power — the power that comes from being one of few buyers of a good or service (in this case, labor) — the worker is paid less. The ratio of the wage a worker would receive in a perfectly competitive labor market to what he or she actually receives is known as the "markdown." Measures of employer market power based on these markdowns have been scarce, however.

In an article in the *American Economic Review*, Chen Yeh and Claudia Macaluso of the Richmond Fed and Brad Hershbein of the W. E. Upjohn Institute for Employment Research have sought to close this gap in research. In particular, they derived a way to calculate the value of the markdown for any firm by exploiting characteristics of the firm's production function that can be estimated using Census Bureau data on

the firm's expenditures and revenue. They did so by assuming that at least one of the inputs is "flexible" — that is, the firm does not have monopsony power in it, and there are no adjustment costs, among other things; material inputs are often considered to fit this bill. In this way, they were able to control for another distortion that could bias the estimate of the markdown: monopolistic power that the firm might hold in the output market. Since the production function for the firm is not known, they then needed to estimate it, which they were able to do by adapting techniques from industrial organization literature.

The researchers applied the new technique to labor markets in manufacturing. They found that U.S. manufacturing labor markets are highly monopsonistic: Instead of being compensated fully for the firm's additional revenue that is attributable to their labor — a dollar for every dollar of revenue generated at the margin — workers at the average firm are paid 65 cents on the dollar at the margin. The researchers also examined the causes of variation in labor market power and determined that much of the variation is within industries, not across them; in particular, size — whether measured as employment share of the local labor market or as geographic scope — is positively correlated with markdowns.

Nevertheless, these are some sizable differences in markdowns across sectors as well. The researchers found that the highest markdowns were in the Petroleum Refining and Computer and Electronics sectors, where workers

are paid less than 40 cents on the dollar at the margin. Thus, industry-wide factors may also play a role, although within-industry variation appears more important.

The researchers suggested that to understand aggregate trends in labor market power, the markdowns of individual plants and firms need to be aggregated. But aggregation is not straightforward, and thus they also proposed a new aggregation technique that makes progress on this front.

Applying this technique to the data on manufacturing companies, the researchers reached two conclusions. First, when plotted over time, monopsony power in the U.S. manufacturing labor market follows a U shape: From the late 1970s to the early 2000s, the aggregate markdown actually decreased before starting to sharply increase after 2002. This pattern does not track that of labor's share of revenue, which decreased consistently through this period. Second, the aggregate markdown is only somewhat correlated with labor concentration — an index that attempts to quantify how dispersed or concentrated employment is among firms in a market. It is often used as a proxy for the concentration of market power and lack of competitiveness, but its theoretical connection with them, the authors note, is somewhat unclear. Both points potentially provide evidence contrary to some common economic views — namely, that monopsony power is the cause behind stagnating wages and that labor concentration is a good proxy for monopsony power. **EF**



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# ECONOMIC HISTORY

BY MATTHEW WELLS

## The Economic History of the Shopping Mall — and Its Future (Yes, It Does Have One)

Malls have been a part of the American cultural and economic fabric for generations. How will they survive recessions, the rise of online shopping, and a pandemic?

**M**ost Americans probably have an impression or feeling when they think of the mall, whether they spent much time there or not. For some, that sensation may be formed by time spent slurping an Orange Julius, listening to CDs at Sam Goody, or inhaling the fragrances spilling out of Bath & Body Works. Others' impressions may have come from the ubiquity of malls in popular culture, from Joan Didion's 1975 essay "On the Mall," to movies like *Mallrats* or George Romero's *Dawn of the Dead*, to, most recently, Starcourt Mall in the television series *Stranger Things*.

Malls have been part of the landscape even before they were called malls. Baltimore's Roland Park Business Block opened in 1907 and is in the *Guinness Book of World Records* as the world's first shopping center. It offered six shops, including a drug store, grocery, and bakery, in an English Tudor-style complex in the heart of a planned suburb. As the suburbs developed and the country embraced the automobile, larger shopping areas with parking lots, like Richmond's Cary Court, built in 1938, would allow those suburbanites to get much of their shopping done in one place, eliminating the need to either drive downtown or make multiple stops around town. Some of them, including Kansas City's Country Club Plaza (1923) and Dallas' Highland Park Shopping Village (1931), evolved, growing into modern outdoor malls that still attract shoppers today.

The first planned shopping mall, however, met a different fate. Northland Center, in Southfield, Mich., just outside Detroit, opened in 1954 and was the



Fashion Centre at Pentagon City in Arlington, Va., shown here shortly after its 1989 opening, epitomized 1980s mall design with anchor department stores, thousands of parking spaces, and a skylit atrium extending from the central courtyard.

first to pair a department store with smaller retail stores. Like many malls around the country, however, it struggled in the 1980s and '90s. After years of decline, the Macy's finally closed in March of 2015, and the rest of the mall's tenants left a month later. Northland Center has remained vacant since.

Northland Center's history is not unique, and the national trends have been a source of concern for years. The COVID-19 pandemic only intensified the doomsday predictions. Moody's Analytics reported that the vacancy rate for regional malls in the United States spiked to a record 11.4

IMAGE: PHOTOGRAPHS IN THE CAROL M. HIGHSMITH ARCHIVE, LIBRARY OF CONGRESS, PRINTS AND PHOTOGRAPHS DIVISION

percent in the first quarter of 2021, up from 10.5 percent the previous quarter. This was the largest increase on record, surpassing the 0.8 percentage-point increase in the first quarter of 2009 during the Great Recession. At the height of the pandemic, forecasters suggested that over one-third of all malls would permanently shutter.

Despite these predictions, malls persist. Prior to the pandemic, about 88 percent of retail sales happened in a physical store location; that number has remained surprisingly stable, around 86 percent today. Furthermore, and in contrast to the anticipated mass closures, the total number of malls in the United States – around 1,150 – has stayed consistent over the past three years despite being ground zero in terms of the pandemic’s effect on the economy.

Malls are rich with history as places of community and consumption. Will they eventually experience the same fate as Northland, or will they adapt to a changing landscape, defying predictions and continuing to be places that create new memories for future generations?

## **BRINGING MAIN STREET TO THE SUBURBS**

In the fall of 1948, Victor Gruen, an Austrian-born émigré and architect, was stuck on an unexpected layover in Detroit. To pass the time, he toured the streets of greater Detroit and observed what he would later refer to as “a garishly advertised parade of filling stations, hot dog stands, department stores, snack bars, liquor stores, supermarkets, chain stores, used-car lots, and funeral parlors.” He considered suburban streets like these chaotic and would later call them “avenues of horror.”

At the same time, the people living in the suburbs – many of them new homeowners thanks to the 1944 GI Bill – wanted access to the shopping districts and department stores found along the main streets of America’s downtowns. But those downtowns had their own issues that kept many of

these suburban dwellers away. Cities were loud and dirty and increasingly seen as crime ridden.

Gruen and others believed that the messy streets and the desire to have plentiful shopping nearby could be addressed by bringing the downtown department stores and their surrounding shopping districts to the suburbs. He was the first to do so, as his design of Northland Center brought Hudson’s out of downtown Detroit as its anchor department store. Two years later in 1956, Dayton’s department store in Minneapolis would serve as one of the two anchor stores at Southdale Shopping Center in Edina, Minn., another Gruen design that was the first enclosed, temperature-controlled mall in the United States.

This belief that the suburbs could potentially replace cities’ downtowns as the locus of civic and commercial life had been around for a while. In *Meet Me by the Fountain*, her recent book chronicling the history of shopping malls, architecture critic Alexandra Lange noted that by the early 1940s, urban planners and designers “had already begun to advocate for shopping centers as both retail and social hubs, suggesting playgrounds, schools, and theaters as add-ons to agglomerations of shops.” Reflecting this sense that the mall was at the heart of a mixed-use, centrally planned development, the president of Dayton’s noted that Southdale would “offer a pleasant place to shop, a good spot in which to work, and a fine neighborhood in which to live.”

## **BUILDING THE NEW TOWN SQUARE**

Suburban malls addressed another major issue with the downtown shopping experience: the lack of good parking. Downtown shops were frequently either located on different streets or spread along streets that had no parking, forcing shoppers to walk long distances. Malls, however, would have plenty of room for parking. Indeed, Southdale had room for 5,200 cars,

while Northland Center would have an astounding 8,344 parking spaces.

These first-generation malls also looked profoundly different than downtown shopping areas or even the early shopping centers like Cary Court, which resembled modern-day strip malls. Whereas city and strip mall stores faced outward toward the street, mall shops would do the opposite and face each other, sharing an enclosed plaza or atrium. Public art, particularly sculptures, filled these spaces, along with fishponds and live trees. Southdale would also have a 21-foot-tall bird cage. The exterior walls of the mall, on the other hand, were blank facades, freeing them from the signage and clutter that Gruen found so distasteful about suburban thoroughfares.

This layout became the archetype for malls all over the country, built to address the needs and desires of the postwar suburban middle class. The *Community Builders’ Handbook*, first published by the Urban Land Institute in 1947 and updated annually, included a typology of outdoor shopping centers according to size and later would carry over to the indoor mall. The smallest category, the neighborhood center, would have up to 20 shops, including a grocery store, a drug store with a lunch counter, dry cleaner, filling station, and, as women usually did the shopping, a beauty parlor. The next, larger category of mall was the community center, which would have between 20 and 40 stores. In addition to everything in a neighborhood center, it would also have a florist, gift shop, milliner (a women’s hatmaker), liquor store, and a small department store. Finally, the regional center, with 40 to 100 stores, would be the true suburban mall. It would have all the stores of a neighborhood center plus at least one full-size department store, a dress shop, theater, café, toy store, and doctors’ and dentists’ offices.

Amenities such as the theater and café had a purpose beyond feeding and entertaining patrons. They would

also help generate sales by, in Lange's words, "creating an atmosphere to encourage lingering."

### THE SECOND GENERATION: "FUN HOUSE LOGIC"

Sixty malls were built between 1950 and 1955. That number would balloon to 240 malls built between 1961 and 1970. James Rouse, an urban planner and developer who had assisted Walt Disney in the design of EPCOT, played a significant role in that growth. Rouse was a firm believer in the mall's role as a place for community and that going there should be an experience that went beyond shopping. Nothing defined this cultural experience more than the food court, which Rouse first directed to be included in the design of New Jersey's Paramus Park Mall (1974). While he believed that a food court could be a place where teenagers could mingle in relative security, mall owners looked at the financial benefit: Jones Lange LaSalle, a commercial real estate firm, reported in 2019 that malls with a good food court enjoy almost 25 percent more in sales.

Rouse was not alone in his thinking that the mall should be a place of community with more to do than just shop. Jon Jerde was a Los Angeles-based architect who designed several prominent malls from the 1970s through the 2000s, including the Horton Plaza (1985) in San Diego, the Mall of America (1992) in Bloomington, Minn., and Universal CityWalk (1993) in Los Angeles. Jerde drew inspiration from an unlikely but passionate collaborator: Ray Bradbury. Bradbury, primarily known as a creator of far-off worlds in literature, authored "The Aesthetics of Lostness," the manifesto that would embody Jerde's vision for Horton Plaza: "To be lost. How frightening./ To be \*safely\* lost. How wonderful./ To not know where we are, as children, is a nightmare./ To not know where we are, as adults, traveling, is a perfect dream."

As the words suggest, Bradbury — and Jerde — imagined the mall as a

place where there was shopping, but also the opportunity for excitement and discovery. Rather than the ordered layouts envisioned by Gruen, they would follow what one critic called a "fun house logic," full of nooks and crannies, and diagonal or curved walkways, bridges, and escalators. They also abandoned the widely accepted idea of limiting the mall to two stories, believing that additional levels would allow for teenagers to congregate tucked away from those who were there to shop rather than socialize. No mall embodied this philosophy more than the Mall of America. In addition to the over 400 shops and restaurants at its opening, its four levels also contained an amusement park with a variety of roller coasters and a full-size aquarium that opened in 1996. Nowadays, additional attractions include a comedy club and an escape room experience. With this eye toward integrating entertainment and commerce, it is perhaps unsurprising that Jerde also designed several of the Las Vegas Strip's most prominent hotel-casinos, including the Wynn and Bellagio, as well as the Fremont Street Experience downtown.

### THE DEATH OF MALLS?

Over 1,500 malls reflecting Gruen's or Jerde's models were built between 1956 and 2005. In the 1980s, films like *Fast Times at Ridgemont High* and *Bill and Ted's Excellent Adventure* firmly positioned them in popular culture as places to see and be seen. By the 1990s, however, surveys showed that Americans by and large no longer saw shopping as a leisure activity, and the average number of hours consumers spent in a mall per month went from 12 in 1980 to just four in 1990.

After the Great Recession of the late 2000s and into the mid-2010s, observers feared a retail apocalypse. In 2014, Green Street Advisors, a commercial real estate analysis firm, predicted 15 percent of malls would close in the next decade. Credit Suisse went further, suggesting in 2017 that upward

of 25 percent of malls, or more than 200, in the United States would close by 2022. Indeed, the trends in the years prior to the pandemic had not been promising. FGRT (formerly Fung Global Retail and Technology), a retail think tank, reported that almost 7,000 retail stores closed in 2017, more than double the number of stores that closed the year before. CoStar, a commercial real estate research firm, declared in 2018 that a record 145 million square feet of retail space would fall vacant in the United States that year.

Why the decline? Observers point to at least three potential causes. First, put simply, there were too many malls. Even today, there are about 24 square feet of retail space for every American, compared to just 4.6 in the United Kingdom and 2.8 in China. Malls built near one another would often cannibalize each other, with one — most likely the one with better stores and that was kept in better condition — prospering while the other slowly faded and ultimately closed. The second factor is the rise of the internet. Online shopping not only gives shoppers access to far more items than what could be found in a mall, but also it allows them to shop quickly through search and filter functions. It is much quicker to browse an app or website than walk around a store or mall. Finally, department stores like Macy's, Dayton's, or Hudson's, which were what brought shoppers into the malls, were abandoned by middle-class consumers who turned to more budget-friendly stores like Target and Kohl's during the Great Recession. This shift in consumer preferences left many traffic-generating anchor spaces vacant: Green Street Advisors estimated that 360 mall-based department stores closed between 2016 and 2020.

### A REIMAGINED, REPURPOSED, AND RETROFITTED FUTURE

The drop in the number of malls across the country from 1,500 malls in 2005 to 1,150 today suggests they have, indeed, struggled. Rumors of their

inevitable demise, however, may be exaggerated. The fact that there are still as many malls today as there were before the pandemic speaks to their resiliency. There are also signs in-person shopping is rebounding, as retailers announced 3,694 store openings as of April of this year, compared to just 1,385 closures, according to Coresight Research, a retail tracking firm.

Tom McGee, the president and CEO of ICSC (formerly the International Council of Shopping Centers), says he's optimistic. "If the pandemic didn't cause a dramatic decline in the number of these centers," he says, "then almost nothing will."

When asked what factors separate malls that succeed from those that don't, McGee offers a simple explanation. "Ultimately, it's a marketplace," he says. "People want to go to a place that has the best collection of retailers and restaurants that fit their needs." Lange concurs, suggesting that the malls that will continue to thrive are "malls that continue to feel special, like they are up to date in terms of their décor and their offerings." For some larger malls, this may mean maintaining a higher-end department store, such as a Nordstrom or Neiman Marcus.

For others, including smaller malls, it may mean reimagining the kinds of retail and dining options they offer. In the past, malls were largely homogenous with few, if any, local retailers or food options and plenty of national chains like Hot Topic or Cinnabon. This is because, at their construction, suburban malls reflected the preferences of suburbanites, whom developers also thought were homogenous. The suburbs, however, have become more diverse along nearly every dimension, and malls need to adapt. An example

of this adaptation is Westfield Santa Anita, a mall in Arcadia, Calif., about 20 miles east of downtown Los Angeles. As the community shifted over the years from a mostly white suburb to majority Asian, so did the mall's offerings, adding the Japanese design store Muji and Din Tai Fung, the Taiwanese dumpling chain. In 2016, it opened a "food alley" full of Asian offerings, including the first continental U.S. location of Uncle Tetsu Japanese Cheesecake.

Increasingly diverse or higher-end food options like these are becoming an important driver of overall mall traffic. "As food halls evolved, they're designed to get you into the mall as almost the primary attraction," said Garrick Brown, an independent real estate analyst formerly with Cushman and Wakefield, a commercial real estate brokerage. "The amenity now is shopping."

To remain competitive, malls also must find ways to repurpose what Lange called "reservoirs of open space." Now-vacant department store spaces are particularly attractive places for injecting not just new energy into a mall, but also new revenue. Because these stores generated traffic into the wider mall, they frequently did not pay rent or it was highly subsidized by the smaller stores. New tenants in repurposed or divided up spaces, however, would pay. Many are already being repurposed into what can be described as "experiential" spaces like theaters, arcades (such as Dave and Busters), libraries, and, most notably, exercise spaces. CoStar, the real estate research firm, reported in 2018 that the amount of space leased by fitness centers and gyms in malls has increased 70 percent since 2013 and that Planet Fitness had leased the most square footage in malls since 2017.

June Williamson is a professor of architecture at The City College of New York whose research focuses on new, more sustainable futures for the suburbs that reflect the diverse lifestyles, jobs, ages, and backgrounds of their residents. For her, mall properties are a key component of that future, as they have the space for mixed-use developments where people can do more than shop and eat; they can work and live in them too. "We've got all this land that's already distributed within existing neighborhoods and cities," she says. "I think there's a lot of potential there." For example, she notes that the Metropolitan Area Planning Council of Boston calculated that if just 10 percent of Greater Boston's 3,000 strip malls and similar shopping centers were retrofitted for mixed use, that could add 124,000 new housing units, a substantial share of the actual housing need for that region.

Back at Northland Center outside Detroit, and at many other malls around the country, that future is now. Last year, the city of Southfield sold the property to a local developer who has already begun demolition as the first step in the construction of a large mixed-use development. Once completed, the property will have 1,500 market-rate apartments in 14 five-story buildings in what used to be the massive parking lot. Some of these buildings will have retail space on the ground floor. The original retail store spaces will be converted into 254 lofts. The old Hudson's/Macy's space will be transformed into "Hudson City Market," with offices, shops, and possibly a food hall. The tag line on the developer's website touting the project: "Historic Shopping Turned Fashionable Living." **EF**

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## Stephanie Schmitt-Grohé

On inflation, capital controls, and finding research topics

**S**tephanie Schmitt-Grohé is probably one of the few top-level economics researchers without a college degree. A native of Germany, she enrolled to study economics at the University of Münster. After completing two years of her studies, she was offered a Fulbright scholarship to study in the United States. She left temporarily — or so she thought.

“I had studied an English-language textbook, Dornbusch and Fischer [Rudiger Dornbusch and Stanley Fischer’s *Macroeconomics*],” she says, “and I liked it a lot and thought it would be great to go to the U.S. for one year on an exchange.”

The Fulbright program placed her at the City University of New York where, unaccountably, she found herself in the MBA program. “I didn’t really know what an MBA program was,” she says. But she finished the two years of courses with a concentration in finance and realized she was eligible to apply for an American Ph.D. She went on to the doctoral program at the University of Chicago, and from there, to a stint at the Fed and then academia.

In the early 2000s, she was a pioneer in calling attention to the possible importance of the zero lower bound on interest rates — an issue that became significant for Fed policymakers and central bankers worldwide during and after the Great Recession of 2008-2009. She was awarded the 2004 Bernácer Prize, which is given annually to a European economist under the age of 40 for outstanding contributions in the fields of macroeconomics and finance.

Today, Schmitt-Grohé remains a prolific researcher on monetary economics and macroeconomics. (“Grohé” is pronounced “groh-hay.”) She has often co-authored her research with her husband and Columbia colleague, Martín Uribe. She is the co-author, with Uribe, of a graduate textbook on the macroeconomics of international trade, *Open Economy Macroeconomics* (Princeton University Press, 2017) and, with Uribe and Michael Woodford, an undergraduate textbook, *International Macroeconomics: A Modern Approach* (Princeton University Press, 2022).

David A. Price interviewed Schmitt-Grohé by phone in July 2022.



**EF:** Were there any big adjustments for you when you came to America to study?

**Schmitt-Grohé:** The courses at my German university were large. It was the University of Münster, and there were many lectures for 200 people or so. When I came here to CUNY, where the Fulbright people placed me in an MBA program, courses were small, 25 people in a class. Also, I was able to get a job working for some professors as a research assistant. That was a different way of learning. And then I lived in International House, a residence for graduate students in New York; it’s near Columbia University. There, I met a bunch of other people from all over the world who were doing a Ph.D. somewhere. I think it changed my exposure and the intensity of my studying.

**EF:** You began your career at the Fed’s Board of Governors under Chair Alan Greenspan. What was it like to start out as a research economist at the Fed?

**Schmitt-Grohé:** It was a wonderful experience. When I started, I worked in a section in the Division of Monetary Affairs for Vincent Reinhart. He was a wonderful boss and taught us a lot.

I would say four things were great about the job. At the beginning, you have almost all of your time for research. So you come out of graduate school, you have all the papers of your dissertation, and you’re trying to polish them to send to journals. The Fed gives you the time to do that. I would say you have more time to do that if you work in the research department at the Fed than if you start teaching at a university because you have to make one or two course preps, which takes time. So that was one great thing.

A second great thing is they used to hire — probably this is still true — something like 20 or 30 Ph.D.s a year out of top

graduate schools. And they were more or less all in macroeconomics. If you go to a university, most likely you have, at most, two or three junior colleagues in your field. But at the Fed, you had a large cohort of them with whom you could interact and talk at lunch — there was a culture of going for lunch together in the Fed’s cafeteria — so it was stimulating in that way.

Another thing that was great was that you had to do a little bit of policy work. The Board of Governors wants to learn what the research staff thinks about the economic issues of the moment and what economic policy would be the correct one. Once or twice a year, you had to write a memo that you would read aloud in the FOMC briefing, so your audience was Alan Greenspan and the other governors. So you got to work on interesting issues and you got an understanding of what the relevant questions are. The process gave you a pipeline of research questions that you could work on later.

Lastly, because the Board is such a big institution, it runs a pretty large program of workshops with outside speakers. Almost too many speakers came through — more than one per week. You got exposed to all the major figures in your field because they came to give a workshop or they came to visit the Fed for one or two days. It was a productive and great time at the Board.

**EF: How important do you think price stability is compared to other policy priorities of central banks?**

**Schmitt-Grohé:** When Martín and I got interested in the topic of price stability, there was an influential paper on optimal monetary and fiscal policy that concluded that when you have a change in the fiscal deficit or government spending, responding by adjusting distortionary taxes — say, labor income taxes — is not good from a welfare point of view. What you can

do instead, the argument went, is to have surprise inflation. So if you get, say, an increase in government spending, and you need to finance that, then if nobody’s expecting inflation, you can just have a one-year surprise inflation. And that literature concluded it was, in fact, the best thing to do: Keep tax rates steady and finance surprises to the budget with surprise inflation.

Martín and I wondered what would happen to this result if one were to introduce sticky prices — the idea that prices are costly to change — into the

**“If you go to a university, most likely you have, at most, two or three junior colleagues in your field. But at the Fed, you had a large cohort of them with whom you could interact and talk at lunch — there was a culture of going for lunch together in the Fed’s cafeteria — so it was stimulating in that way.”**

situation. Our contribution was to show in a quantitative model that the trade-off between surprise inflation and tax smoothing was largely resolved in favor of price stability. With price stickiness, volatile inflation is welfare-reducing. It sort of overturned the previous result.

Do we need to have high volatility in the labor income tax rates or other tax rates, then? No, if you have a fiscal shortfall, it should be financed by debt. The only thing you need to adjust the income taxes for, roughly speaking, is to finance the interest on this additional debt. So our models predicted that under optimal policy, in a world with distortionary income taxation and sticky prices, price stability should be preserved.

One issue that I think has been coming back a little bit is how is the United States going to finance a massive fiscal deficit that created the big stack of debt? Are we going to use surprise inflation? Here our research would say no, it’s not optimal to do that.

**EF: Some have argued that if a central bank follows a fixed rule for monetary policy, rather than exercising judgment, the economy will be more stable. Do you agree?**

**Schmitt-Grohé:** There’s an issue whether the monetary policy rule followed really achieves its intended target. I co-authored a paper with Martín and Jess Benhabib about this issue called “The Perils of Taylor Rules” in 2001.

Let’s go back 20 years. At the time,

one of the policy questions that arose and that I discussed with my colleagues at the Board was the situation in Japan. Japan had lowered the nominal interest rate to, roughly speaking, zero after its recession in the early 1990s. Japan was in deflation, and the issue was, how did they get there? Now it’s 1999-2000, almost five years after the recession

— how come inflation is so low, when they have the nominal interest rate at zero? Shouldn’t putting the nominal interest rate at zero signal easy policy and therefore low real interest rates? And shouldn’t that, in turn, stimulate demand and shouldn’t we see inflation coming back up?

We started thinking about the Japanese situation and the Taylor rule. The Taylor rule says that whenever inflation is lower than the central bank’s target, the central bank keeps the nominal interest rate low, and whenever inflation is above the target, the central bank raises the policy rate. The rule is called the Taylor rule after John Taylor’s seminal paper in the early 1990s. We were considering whether behaving in such a way necessarily brings you to your inflation target of, say, 2 percent. What we pointed out in that paper is it might not because there’s effectively a zero lower bound on nominal interest rates.

Our concern with the Taylor rule was that it was always thought about

locally. If inflation is lower than your target, you lower the policy rate. If inflation is above your target, you increase it. But what happens if inflation is below your target, and you want to lower the nominal interest rate, but you are already at the zero lower bound? Following the Taylor rule might bring about the intended inflation rate, but it might instead just cement an economy in this liquidity trap situation, where the nominal interest rate is at the zero lower bound and inflation is below target. It might just lead to an anchoring of long-run inflation expectations to values below the inflation target. So we said that may be one way to understand the situation in Japan at the time.

When we wrote this paper, we could have never anticipated that this would become a relevant theme in the United States, as well as in many countries around the world, after the global financial crisis, when people were struggling to understand how come inflation was below target for so many years even though policy rates were at the zero lower bound.

**EF: With regard to inflation, we've entered a very different situation in a short time. What do you think has happened there?**

**Schmitt-Grohé:** Yes, I think the type of shock that occurred with the pandemic is different than the negative demand shock of the recession of 2008. It's probably more of a supply shock. And it was, at least initially, a type of shock that changed the price of some goods, but not of others. So there were large relative price changes. People wanted to renovate their houses because they were now spending a lot of time at home. So there was a great demand for anything you want to do in home repair, and big increases in demand for durable goods. At the same time, you had closures of factories, people not going to work. So those type of goods became more expensive.

The question is, what happens when there's a large relative price change?

## Stephanie Schmitt-Grohé

### ■ PRESENT POSITION

Professor of Economics, Columbia University

### ■ PAST POSITIONS

Professor of Economics, Duke University, 2003-2008; Assistant Professor and Associate Professor of Economics, Rutgers University, 1998-2003; Economist, Division of Monetary Affairs, Federal Reserve Board, 1994-1998

### ■ SELECTED ADDITIONAL AFFILIATIONS

Research Fellow, Centre for Economic Policy Research; Research Associate, National Bureau of Economic Research; Member, Advisory Panel, Bank for International Settlements

### ■ EDUCATION

Ph.D. (1994), University of Chicago; MBA (1989), Baruch College, City University of New York

It seems that the way this goes is that the good that becomes relatively more expensive has its nominal price go up, and the nominal prices of the other goods don't change. So we see one wave of inflation. But suppose those relative price increases from supply shortages are temporary. How does the relative price come back down? Well, it could be that the nominal price that went up comes back down, or it could be that the nominal prices of the other goods go up to bring the ratio of prices back down.

In the latter case, you would have sort of a wave that looks like, first, the price of lumber goes up relative to food, and then the price of food goes up because that restores the old relative price. I think that could be going on. That could happen if prices have an easier time going up than going down. That's an idea from the structuralist inflation theory of Julio H. G. Olivera.

But is that the whole story? Probably not. Another concern is that there's a massive fiscal obligation in the United States. One way to finance the fiscal deficit is to implicitly default on Treasury debt by having a big increase

in the nominal price level. So there are also fiscal considerations.

**EF: In a working paper that you and Martín Uribe wrote this year, you looked at historical data on U.S. inflation and you found that the recent increase in inflation took place much faster than previous ones since World War II, such as the inflation of the mid-1960s and 1970s. You wrote that to understand the current inflation, it helps to go back to the prewar U.S. economy. Why?**

**Schmitt-Grohé:** We find ourselves a little bit in an unprecedented situation. Inflation has gone up rapidly. And so we were thinking about this pretty unusual development for the postwar period.

We wanted to answer the question that I think everybody is interested in: Is this inflation hike temporary or permanent? Our idea was that during the postwar period — since 1955, say — the only big inflation was the inflation of the 1970s. And that was an inflation that built up slowly and then was ended also relatively slowly — quicker than it built up, but relatively slowly — by Paul Volcker in the 1980s. So we said, since the current inflation is unprecedented in the postwar period, what will we see if we just go further back in history?

Because we wanted to go back in history, we used the database of Óscar Jordà, Moritz Schularick, and Alan Taylor, which goes back to 1870. We saw that the macroeconomic stability that we had in the postwar era was special, at least compared to what we see since 1870. There were many more episodes of high and variable inflation. So we just asked if we give the purely statistical model a longer memory by allowing it to go back in time, how would it interpret the current increase in inflation?

We found that if we estimate the model since 1955, which is what most people do when they talk about cyclical fluctuations — actually, many people only start in the 1990s or look at the last 30 or 40 years, the so-called Great

Moderation period — the model is led to interpret the entire current increase in inflation as permanent. But if the model is given the chance to look back further in time, where we had more episodes of a short-lived and large inflation spike, the interpretation is that only 1 or 2 percent of the current increase in inflation is of a more permanent nature.

An example to look at is the Spanish Influenza of 1918 in the United States. That was also a period of an inflation spike, but inflation had started already a year or two before the influenza pandemic. There were similarities to now, namely a pandemic and high inflation. There was a small increase in the permanent component of inflation during the years around the influenza pandemic, but the majority of it was transitory.

**EF: The Western consensus since the 1990s on economic development, sometimes called the Washington Consensus, has strongly opposed capital controls on the part of developing economies. Research of yours has cast doubt on that consensus. Please explain.**

**Schmitt-Grohé:** Yes. The mantra of the International Monetary Fund for a long time was that capital controls were undesirable; there would be a lot of welfare benefits from having free capital mobility across countries. That was a clear policy position of the IMF. The creation of the European Union took place with the same idea in mind: The core countries adopted the common currency in 1999, but countries were under a deadline to abolish all capital controls much earlier, by 1990. It was believed that to have a functioning monetary union or currency unit, you needed to have free capital mobility across countries.

And then the 2008 crisis came. The periphery of Europe between 2002-2008 experienced large capital inflows, meaning they borrowed a lot from the rest of the world, but

in particular, from Northern Europe. So when the crisis came, they were heavily indebted. For countries in the periphery to repay these debts or service them, there had to be a massive contraction in domestic demand. Thus, the idea emerged that maybe it wasn't such a good idea to have free capital mobility, and maybe with the benefit of hindsight, not so much capital should have flowed into Spain, Portugal, Cyprus, Greece, Ireland, or the Baltic countries. So in policy circles, the idea of going back to some restrictions on international capital flows reemerged.

The idea of a paper Martin and I wrote, "Downward Nominal Wage Rigidity, Currency Pegs, and Involuntary Unemployment," was to say, can we find a reason in terms of economics why you would want to adopt capital controls? What we showed is that one way of thinking about the euro area is basically that Spain, let's say, gave up an independent monetary policy to be on the euro — and when the financial crisis happened, what Spain would have loved to do, from an economic point of view, was devalue the currency. Why? When credit dries up and you're a debtor country, you have to consume less, aggregate demand falls. But demand falls not only for imported goods, but also for nontraded goods, say residential housing, restaurants, all types of nontraded goods. But if people want to buy fewer nontraded goods, this will lower production and employment in that sector.

You might say, OK, that's no problem: What we should see is that the relative price of nontraded goods drops, and there is an expenditure switch away from traded goods and toward nontraded goods. If that happens, we should see a large real exchange rate depreciation. Yet one usually doesn't see that happening. People think the reason it doesn't happen is that nominal prices and wages are rigid, so you don't see the real depreciation — unless there is a nominal depreciation. Somehow, relative prices are not aligned with full employment and

market clearing, and you see involuntary unemployment.

The easiest way to restore full employment in such a scenario is just to have a big devaluation. Then we can change our prices relative to the rest of the world while nominal wages or nominal prices don't have to fall.

Between 2002-2008 in Europe, there were massive capital inflows to the periphery. That led to an increase in demand for traded and nontraded goods. So the price of nontraded goods went up, and nominal wages in many peripheral European countries rose by more than 50 percent — in some countries, by 100 percent. At the time, people saw that and thought the reason for the wage increases was that joining the union led to productivity increases. Now with the benefit of hindsight, we know that didn't happen. Nominal wages just rose because prices of nontraded goods also rose. Then the recession came and we needed those nominal wages to fall. But nominal wages are downwardly rigid and the periphery could not devalue — they were on the euro — so they could not bring the real wage down to a level consistent with full employment.

The idea of our paper was to say, well, since I cannot lower the real wage in the recession, maybe I shouldn't let the wage go up that much during the boom. During the boom, everything is great. We have full employment. But during the recession, the amount of unemployment due to excessively high real wages might have been much lower if we didn't have that many capital inflows; without those inflows, wages wouldn't have been driven up so high to begin with.

So we developed a model that indicated that, during a boom, policymakers shouldn't let that much capital flow into the country. How do you do that? You put in a capital control tax. And then in the crisis, your crisis is not going to be so deep because it didn't have such a large nominal wage growth to begin with. And of course, it is always conditional on the exchange

rate being fixed, because otherwise you could use the exchange rate.

At the time, there was a parallel literature that suggested that having significant capital controls would be optimal due to financial frictions. And it is the case that financial frictions can also explain why it is desirable to have capital controls. But that literature could not explain what many people believe is desirable in the timing — that you should put the capital controls in during good times and not during bad times. The financial frictions literature says during good times, there's not really a problem, but during bad times, you should put in the capital controls. Our conclusion was the opposite.

Just to finish with the Washington Consensus, I think by 2011, the IMF had already changed its official position. I think they were recommending macroprudential policy, part of which is that capital control is actually a desirable policy.

**EF: What are you working on now?**

**Schmitt-Grohé:** An article you asked me about earlier, looking at historical inflation data, was one result of a bigger project. Martín and I are trying

to understand a topic that people are interested in right now, namely, the natural rate of interest.

The real interest rate is defined as the difference between the nominal interest rate and expected inflation. When economists talk about the natural interest rate, which is often called “r-star,” the word “natural” means what would be the value of the real interest rate so that we have full employment. The natural rate of interest isn't observable, because it's an ideal state. But there's a widespread view that it has declined a lot in the last few decades.

The same period has also been a time when inflation declined. So it might make you think that the natural rate of interest could be affected by inflation. And now that inflation is going to go back up again, could that mean the end of low natural rates? We are trying to answer the question in an empirical structural model. And we say no, it's actually not the case; it's really true that the long-run component of inflation doesn't seem to be correlated with the long-run component of the natural rate of interest. That's one of the things we're working on.

Another project is to try to understand the extent to which the recent last couple of decades' decline in the natural rate of interest is permanent. Other people have looked at that. What we bring to the debate is to ask, if there are exogenous variations in the natural rate of interest, what are the consequences to the economy? If the natural rate of interest declines, is that really recessionary? Does it depress the trend of output? So in one sentence, we're working right now on r-star — the natural rate of interest and what shocks to the natural rate of interest do to the economy.

**EF: How do you choose your research topics?**

**Schmitt-Grohé:** There's no formula. There's no recipe. It's more that you have an idea or question and you try to write about that — and while you work, you get other ideas. Once you start on something, maybe the initial idea is not what the paper will be about, but you have insights along the way. From working on one thing, you get ideas and interesting questions for the next project. So it's like a self-feeding process. **EF**



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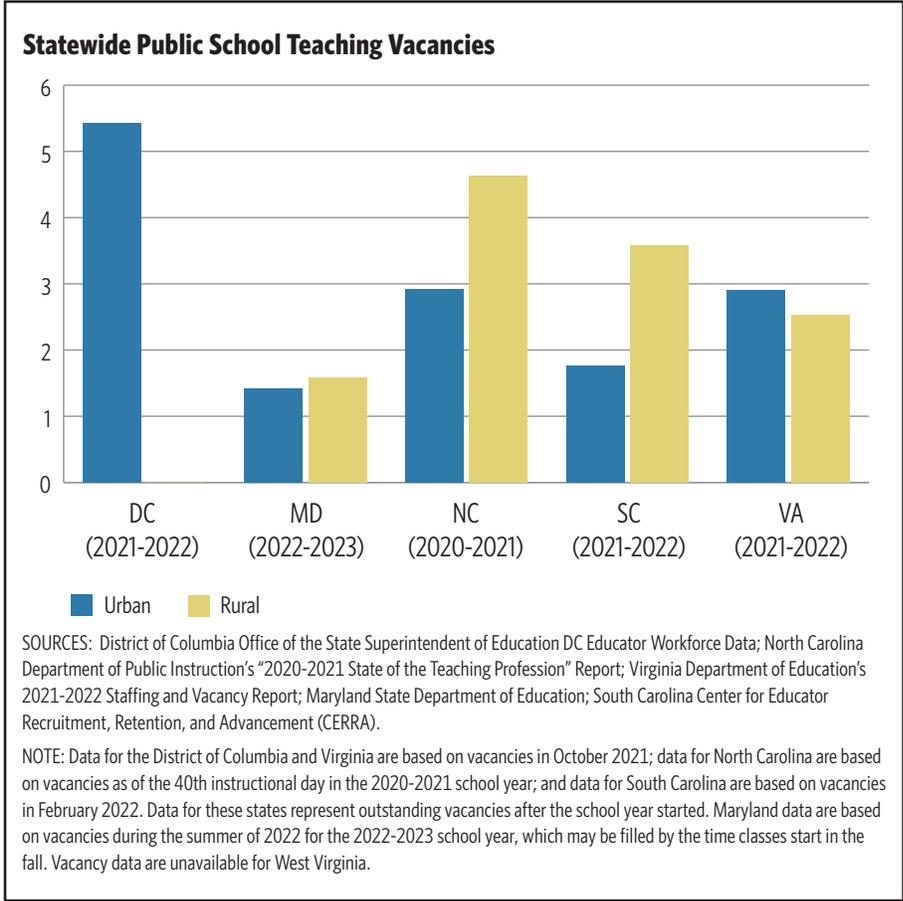
BY SARAH GUNN AND SIERRA LATHAM

# Resolving the Gap in Teacher Supply

“‘Never seen it this bad’: America faces catastrophic teacher shortage” read an Aug. 4 headline from the *Washington Post*. Teacher shortages have been a concern in recent years, as the number of people graduating with a teaching credential has not been sufficient to keep up with teaching job openings. Shortages are particularly severe in certain fields, known as “critical needs areas,” which include science, math, instruction for English language learners, special education, and early childhood education. In many cases, rural school districts have been hit harder than urban and suburban districts.

At the same time, teachers are leaving the profession at a higher rate than usual because of both push and pull factors. COVID-19 put additional strain on the teaching profession, which partially explains the uptick in teacher resignations since the beginning of the pandemic. During stay-at-home orders, teachers adapted to online teaching. Returning to school, teachers were simultaneously held accountable for resolving the learning gaps that emerged due to the pandemic and forced to cope with increased incidence of disruptive behavior among students. In addition to teachers experiencing burnout, the job market outside of teaching is more lucrative than it has been in decades; some teachers’ skills are transferrable directly to non-teaching professions, while other teachers can increase their incomes in other fields through retraining.

Education researchers use several indicators to measure the teacher shortage. Teaching position vacancies are a measure of the teacher shortage at a given point in time. Enrollment in and completion of teacher credentialing programs is a measure of future supply. In addition to these metrics,



researchers also consider the share of teachers with provisional or emergency credentials; a high share indicates that a school was unable to attract traditionally credentialed teachers to apply for open positions.

States and school districts are trying different policies to address the teacher shortage. Teachers in many districts received commitment bonuses and pay raises to try to improve retention. (Of course, not all school districts have the extra financial resources to do so.) Other state and federal programs are designed to increase the pipeline of new teachers. Some states are also expanding the options for provisional certification to make it easier for career switchers to enter the classroom.

### TEACHER VACANCY RATES: DOES GEOGRAPHY MATTER?

Teacher vacancy rates within the Fifth District vary by state and by whether the school district is urban or rural, among other factors. Rural school districts tend to face additional challenges in recruiting and retaining teachers compared with urban and suburban areas. Research has shown that new teachers are hesitant to work in communities that are different from where they completed teacher education training. As few teacher preparation programs provide experience in rural areas, new teachers may not be confident in their ability to teach in a rural context.

Most states in the Fifth District allow school districts to set their own

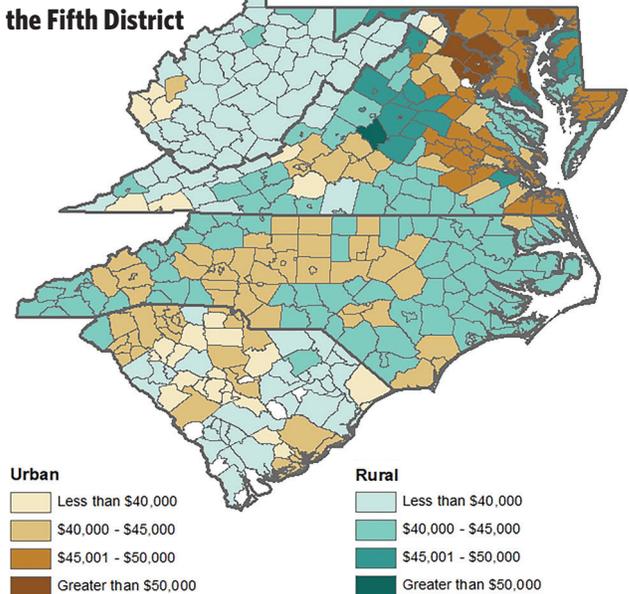
## SETTING TEACHER SALARIES

To the best of their ability, school districts set salary and benefit schedules to be competitive with outside employment opportunities. To compete in a strong job market, schools may also issue signing bonuses to attract new teachers and appreciation bonuses to retain existing teachers. Yet public schools face limitations when competing; they must adhere to budgets determined by state and local resources, which limit their ability to use financial incentives to attract and retain qualified teachers.

In most states throughout the Fifth District, teacher salary schedules vary across school districts. The two exceptions are the District of Columbia and North Carolina. The District of Columbia has a single public school district and thus needs only one salary schedule. North Carolina sets teacher salary schedules at the state level but permits individual school districts to provide local supplements.

For a new teacher with a bachelor's degree, starting salaries tend to be highest in the Washington, D.C., metro area, several urban districts in Maryland, and in rural Nelson County, Va. (Nelson County made a policy decision to front-load its salary schedule and decrease the value of step increases over the course of a teacher's career.) School districts with relatively low starting salaries tend to be located in rural areas in West Virginia and South Carolina. (See map.)

### Starting Salary for a Teacher with a BA in the Fifth District



SOURCES: D.C. Public Schools "FY 2019 ET15 Salary Schedule"; Maryland Public Schools "Professional Salary Schedules Maryland Public Schools 2020-2021"; North Carolina Department of Public Instruction "Salary Schedules 2021-2022"; South Carolina Department of Education "Fiscal year 2021-2022 District Minimum Salary Schedules"; Virginia Department of Education "2020-2021 Teacher Salary Report"; West Virginia Department of Education "Professional Salary Schedules by County" 2020-2021.

NOTE: Teacher salary schedules in North Carolina are set at the state level. Individual school districts may provide local supplements, but data on school district supplements are not collected at the state level.

salary schedules. Rural school districts have a limited tax base and are less able to offer salaries that can compete with wealthier suburban or urban school districts. (See box.) At the same time, in addition to budget constraints, salary schedules also take into account local cost of living and income characteristics. Across Fifth District states that set salary schedules at the district level, starting salary for a new teacher with a bachelor's degree is positively correlated with median rent, median mortgage payment, and median income across school districts.

Even though rural areas face additional challenges, the highly urban District of Columbia has the highest overall vacancy rate of state-level Fifth District jurisdictions for which we have data. (Maryland tends to have the lowest vacancy rates.) Comparing urban and rural areas within Fifth District states, vacancy rates are higher in rural school districts in Maryland,

North Carolina, and South Carolina; the reverse is true in Virginia. (See chart.)

## MINIMIZING TEACHER TURNOVER

One way to reduce the number of teacher vacancies is to encourage more teachers to stay in the profession for longer. Based on national survey data collected between the 2011-2012 and 2012-2013 school years, about 8 percent of teachers were leaving the teaching profession every year; more than half of those who left teaching were older than age 50, suggesting they left due to retirement as opposed to a career switch. Another 8 percent moved to a different school, which does not affect the overall supply of teachers but creates a new teaching job opening at the school they leave.

Many states and school districts have offered one-time retention or commitment bonuses to teachers and school staff. For example, teachers

in Howard County, Md., received an \$1,800 commitment bonus this spring. Henrico County in Virginia is planning to pay every teacher who returns for the 2022-2023 school year a \$500 bonus. In the fall of 2021, teachers in Roanoke County, Va., each received an appreciation bonus of \$1,200; special education teachers received an additional \$2,300 stipend, indicating the challenge faced in retaining and recruiting qualified special education teachers. Teachers there will receive another \$575 bonus in December 2022.

In addition to those bonuses, states and school districts are increasing teacher salaries for the long term. West Virginia approved a 5 percent pay increase for its teachers. Virginia approved a statewide 10 percent increase in teacher pay over two years, and some districts are adding more. In July, North Carolina approved a 4.2 percent increase in teacher salaries. South Carolina has raised the

minimum teacher salary in the state to \$40,000. A number of school districts there are raising all teacher salaries. For example, teachers in the Lexington-Richland 5 school district near Columbia, S.C., raised first-year teacher salaries for the 2022-2023 school year by 4.3 percent, and all teachers in Greenville County Schools in South Carolina will receive at least a 3 percent increase in pay. In Maryland and the District of Columbia, teacher unions play more of a role in determining teacher salaries; as recently as August, negotiations between unions and school districts on salaries for the 2022-2023 school year were still under way in many places.

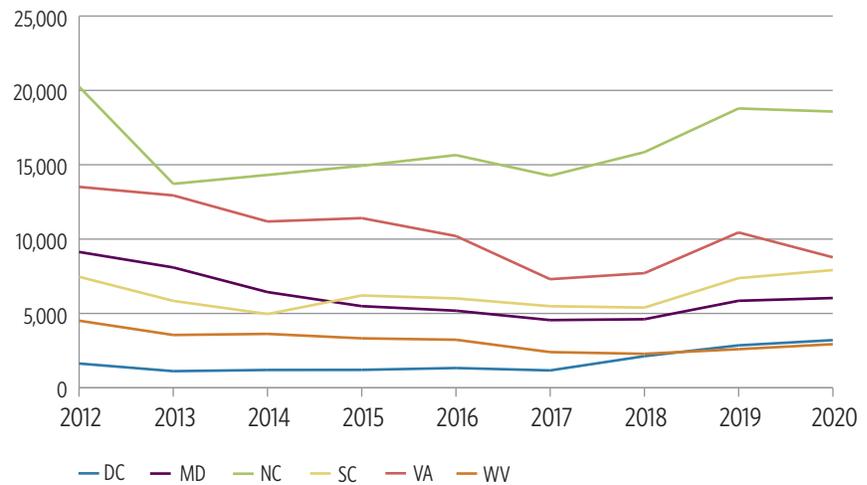
While many states are increasing teacher salaries, the increases in pay may not be enough to keep up with inflation. Typically, teachers move up their state's or district's salary schedule on a regular, usually annual, basis, but increases in the overall salary schedule for teachers are not guaranteed to take place and can vary from year to year and state to state based on local and state government circumstances. The national average increase in teacher pay for all years from the 2011-2012 school year to the 2020-2021 school year ranged from 0.56 to 2.85 percent, calculated in current dollars.

### FILLING VACANCIES WITH EXISTING TEACHERS

Another way to fill vacancies in one district is to attract teachers from other districts. Some school districts are doing that through signing bonuses. In the summer of 2021, Guilford County Schools in North Carolina began offering teachers up to a \$20,000 signing bonus if they committed to teach there for a period of time. Henrico County in Virginia is adding a referral bonus of \$500 for current employees who refer a candidate who is eventually hired.

Additionally, districts can retrain their current teachers and staff to fill critical need positions. South Carolina created a program, SC CREATE, to

### Traditional and Alternative Teacher Credential Program Enrollment



SOURCE: 2020 Title II Reports

increase special education teachers by providing funding to current employees for training that would add a special education certification to their existing teaching license or to obtain a traditional or alternative special education license.

Allowing retired public employees to return to the classroom without jeopardizing their pensions is another way, at least temporarily, to fill vacancies. In April 2021, South Carolina passed a law increasing the earnings limit from \$10,000 a year to \$50,000 a year for eligible state retirees who work in the public school system. But of course, retired teachers can be expected to return to the classroom for only so long.

### TRENDS IN TEACHER PREPARATION PROGRAMS

When vacancies do occur, it helps to have a pipeline of people who are new to the profession to fill them. There are two primary avenues to the teaching profession: through a traditional teacher preparation program at a college or university that usually results in a bachelor's degree in education, or alternative preparation programs that usually require candidates to already have a bachelor's degree but often allow a candidate to begin teaching while earning their credential.

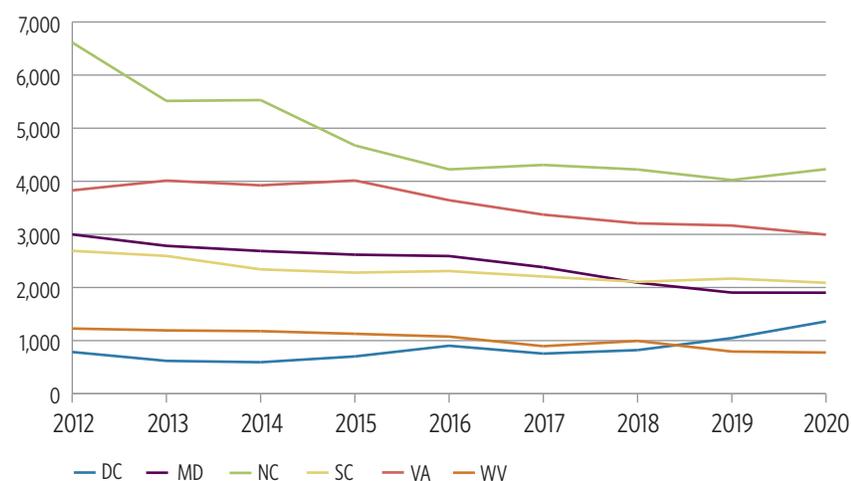
In most states in the Fifth District, however, total enrollment in teacher

preparation programs has declined since a decade ago. (See chart.) Enrollment has decreased since 2012 by over a third in Maryland, Virginia, and West Virginia. The notable exception is the District of Columbia, which saw enrollment in teacher preparation programs nearly double between 2012 and 2020. Much of the growth there can be attributed to increased enrollment over the period in a newer alternative teacher preparation program offered online to students located throughout the country by Moreland University, an online institution based in the District of Columbia.

The most recent teacher preparation program enrollment data available are for the 2019-2020 academic year — before the pandemic. Preliminary data on overall college enrollment rates at most types of institutions indicate that enrollment has declined since the start of the pandemic. Assuming that a similar share of incoming students will choose to pursue traditional teacher preparation programs, this could indicate that enrollment in teacher preparation programs has also dropped. Moreover, the future is expected to bring a decline in the number of students graduating with bachelor's degrees, which will limit the number of potential teaching job candidates seeking alternative certification.

While enrollment has declined in most places, the number of people who

### Traditional and Alternative Teacher Credential Program Completers



SOURCE: 2020 Title II Reports

actually completed teacher preparation programs has declined even more. (See chart.) Between 2012 and 2020, Maryland, North Carolina, and West Virginia saw the number of program completers fall by between 36 and 37 percent. Both South Carolina and Virginia saw a decline of 22 percent. Only the District of Columbia saw an increase in the number of program completers between 2012 and 2020, again due in part to the Moreland University online program that is training teachers across the country.

#### BOOSTING THE TRADITIONAL TEACHER PIPELINE

The cost of earning a bachelor's degree to become a teacher is seen as one barrier to building the pipeline of quality teachers. Some local, state, and federal programs have been put in place or expanded to reduce the cost to students.

Students pursuing coursework required to become a teacher might be eligible for a federal Teacher Education Assistance for College and Higher Education (TEACH) grant that awards up to \$4,000 a year toward their education if they agree to teach in a high-need field at a low-income school for four years. If, after a period of eight years, the requirements have not been met, the grant converts to a student loan.

Teachers with student loan debt

might also be eligible for forgiveness programs after certain requirements are met. The federal Teacher Loan Forgiveness program will forgive up to \$17,500 in student loan debt for teachers with qualified loans who taught certain subjects at low-income schools for five consecutive years. The Public Service Loan Forgiveness program, which forgives all student debt after 10 years of public service, is another option for teachers. While the TEACH grant, Federal Teacher Loan Forgiveness program, and Public Service Loan Forgiveness program have been in place for a long time and uptake has been lower in some programs than would be expected, recent administrative changes might make it easier for future prospective teachers to benefit.

One important component of a traditional educator preparation program is student teaching. These experiences offer students an opportunity to get real-world experience in a classroom setting alongside a mentor teacher. But the programs require student teachers to be in the classroom full time for between 12 and 16 weeks, during which it is difficult to maintain other employment. Typically, student teachers are not paid, which can be a barrier for completing a teacher preparation program.

Some state and local efforts are underway to change that. In August

2021, Oklahoma announced that it would use \$12.75 million of its federal COVID-19 relief funds to pay student teachers a stipend of up to \$3,250. The first half would be paid to the student teacher at the start of student teaching, and the second half would be paid when they are hired by an Oklahoma public school district. The program is currently in place for students enrolled in teacher preparation programs in the state from fall 2021 to spring 2024. Other states, though none in the Fifth District, have pending legislation to provide a stipend to students during their student teaching.

#### ALTERNATIVE TEACHER PIPELINES

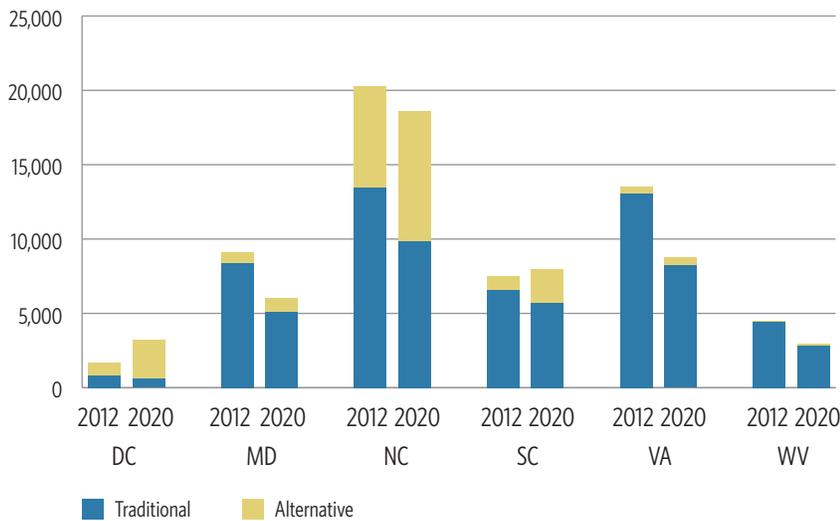
Since 2012, a larger share of enrollment in teacher preparation programs has been in alternative programs. (See chart.)

Alternative certification requirements vary by state. In all states in the Fifth District and the District of Columbia, school districts are allowed to hire qualified candidates with a bachelor's degree relevant to the subject they are being hired to teach on a provisional (or preliminary) license. The new teacher is permitted to begin teaching while completing coursework for an alternative teacher preparation program, which usually takes between one and three years. After completing the alternative program, the teacher will be awarded a traditional teaching license.

In addition to provisional licenses, some states permit school districts to issue emergency licenses for open teaching positions. As with a provisional license, an emergency license allows a qualified applicant without a traditional teaching certificate to begin teaching while enrolled in an alternative teacher preparation program, though this can vary by state.

The share of teachers with emergency or provisional licenses varies throughout the Fifth District. Virginia has the largest proportion of counties in which more than 10 percent of teachers have provisional licenses,

## Teacher Credential Program Enrollment, by Program Type



SOURCE: 2020 Title II Reports

while North Carolina has the largest proportion of counties with no provisionally licensed teachers. In Maryland, urban teachers are more likely to be provisionally licensed than rural teachers, and the reverse is true in North Carolina. In Virginia, similar shares of teachers are provisionally licensed across urban and rural school districts. (See map.)

Teachers with provisional or emergency licenses do not start out with the same level of education training as teachers who have a traditional license. Education training prepares teachers with the skills they need to manage a classroom and deliver content. Evidence suggests that students of teachers with emergency or provisional licenses do not perform as well as students of teachers with traditional credentials. Once teachers have obtained their alternative credentials, however, these teachers' students perform just as well as those who obtained a traditional credential.

Provisionally or emergency licensed teachers also may experience high turnover relative to traditionally licensed teachers. A recent study conducted by researchers in Oklahoma explored emergency licensed teachers' motivations for entering the teaching profession. While many of them are motivated by student outcomes, several

interviewees indicated that they became teachers with emergency licenses to test whether teaching was a good career fit in the long term. If this is the case, a fraction of emergency licensed teachers are likely to leave teaching within a few years of being hired. So while provisional and emergency licensing might be a short-term solution, school districts should expect some disruption to the continuity of the educational environment for students at schools where emergency or provisionally licensed teachers are placed.

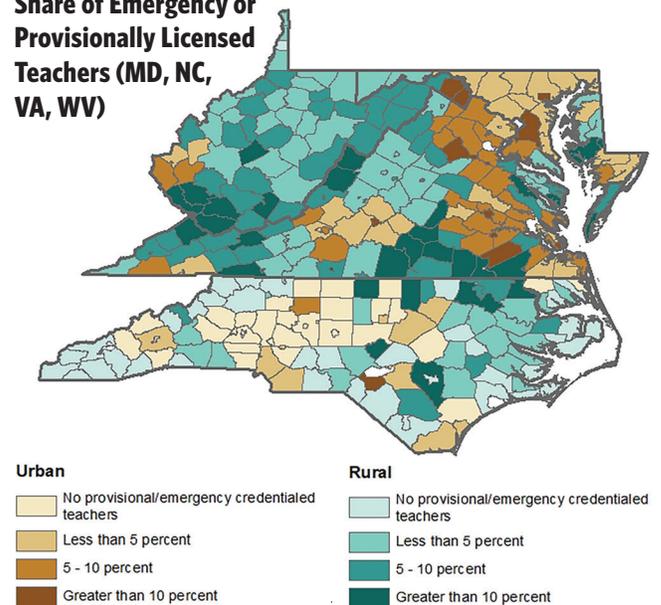
One of the most well-known alternative paths to becoming a teacher is the Teach For America (TFA) program. TFA corps members commit to teaching for two years in a low-income school in one of more than 50 regions throughout the United States. TFA prepares incoming corps members

for their first year of teaching through intensive teacher-leadership training and provides ongoing professional development and support throughout their placement.

Five TFA regions are located in the Fifth District: Baltimore City and County in Maryland; the D.C. region; Eastern North Carolina; the Charlotte-Piedmont Triad in North Carolina; and South Carolina.

A survey of TFA alumni from 2011 found that nearly two-thirds of teachers continued as public school teachers after their two-year commitment, although they may not have stayed in the low-income school in which they were placed. This suggests that TFA is a somewhat effective strategy for recruiting people into the teaching profession early in their careers and at least temporarily filling teaching vacancies at hard-to-staff public schools. At the same time, more than half of TFA teachers leave the school at which they were placed after their

## Share of Emergency or Provisionally Licensed Teachers (MD, NC, VA, WV)



SOURCES: Maryland State Department of Education; North Carolina Department of Public Instruction, School Report Card Resources for Researchers; Virginia Department of Education, Virginia School Quality Profiles; West Virginia Department of Education, West Virginia Balanced Scorecard Dashboard School Year 2020-2021.

NOTE: Data are unavailable for the District of Columbia and South Carolina.

two-year commitment is over. Critics of TFA point to this as a downside to the program, saying that rapid teacher turnover disrupts the continuity of instruction in a school.

### RESPONSES IN RURAL AREAS

In addition to these modes of recruiting new teachers, rural communities throughout the Fifth District are also implementing additional strategies for attracting teachers to their school districts.

In Maryland, Frostburg State University has established the Maryland Accelerates teacher residency program – a type of alternative certification program. Students enrolled in the program earn a Master of Arts in teaching and receive a \$30,000 annual living stipend. After completing their training, they commit to teaching in one of western Maryland's rural counties (Frederick, Garrett, or Washington). Similarly, the University of South Carolina's Carolina Collaborative for Alternative Preparation (CarolinaCAP) program is

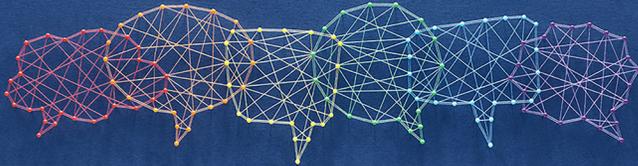
an alternative certification program. CarolinaCAP places participants in teaching positions in rural school districts while they are completing the coursework for their certification. Participants also benefit from ongoing mentoring, coaching, and support throughout their first year teaching.

On a longer time horizon, communities may grow their own supply of teachers. They do this by encouraging graduating high school students to study education in college and then inviting them to teach in their hometown. This strategy has the potential to be effective considering education students often accept teaching positions in the town where they grew up. On the other hand, high school graduates from rural areas are less likely to attend college at all, which dampens the ability for this strategy to fully resolve rural teacher shortages.

### CONCLUSION

The teacher shortage is likely to persist because of retention issues and decreased enrollment in teacher

preparation programs. States and school districts are trying to offer a variety of financial incentives to encourage teachers to stay in the school district or transfer to a new one with higher needs. There are also efforts for school districts to build their own teacher pools and remove financial barriers to encourage potential teachers to enroll in teacher preparation programs, but it will take time for any new enrollees to become teachers. The impact of these policies on teacher turnover and enrollments in programs will become apparent over time, and the policies with evidence of success can be implemented in other areas. Of course, making these programs permanent would require sustained funding after COVID-19 relief funds are spent. It is important to note that much of the additional strain placed on teachers in recent years has not been related to pay. While improving teacher compensation is important, addressing the teacher shortage will likely require finding ways to provide teachers with the support they need to minimize burnout. **EF**



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**June 2022: Southern Virginia**

**May 2022: Cecil County, Maryland**

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**March 2022: Petersburg, Virginia**

BY JOHN MULLIN

# Economics Is a Lucrative Major

The number of undergraduate economics majors has jumped during the past decade, from roughly 27,600 in 2009-2010 to about 35,000 in 2019-2020. Perhaps the economic rewards of the major are part of the reason why.

It's well known that students who attain bachelor's degrees stand to earn a lot more than those who receive only high school diplomas. A 2020 study by the Brookings Institution, for instance, found that the median college graduate earned \$68,000 annually after 30 years in the workforce — a figure that vastly exceeded the \$35,000 earned by the median high school graduate.

Yet as wide as this gap is, researchers have found even larger gaps between the lifetime earnings of people with different college majors. Indeed, a 2015 study by the Georgetown University Center on Education and the Workforce argued, "In some sense, deciding what to major in is more important than deciding whether to attend college." Over a career, according to their figures, a person with a degree in petroleum engineering earned an average of \$4.8 million in total, while someone with a degree in early childhood education earned \$1.4 million. The earnings difference of \$3.4 million swamped the \$1 million difference they found between college and high school graduates.

Economics doesn't score as high as petroleum engineering, but it's in the top 25 highest-earning majors, according to the Georgetown study. Indeed, economics and business economics were the only non-STEM (science, technology, engineering, and math) majors to crack the top 25. (Students considering major choices can gather much information about the wages associated with various degrees from publications such as Georgetown's "The Economic Value of College Majors.")

But there is a caveat that comes with these kinds of statistics: Average wage differences between majors do not necessarily reflect the causal effect of the major. In other words, a major might be more highly paid, on average, on account of the students who enter it, rather than vice versa. Students who choose economics as a major tend to have different aptitudes and interests than people who choose other majors.

**"What you study in college has dramatic ramifications for labor market success."**

**—Zachary Bleemer, UC Berkeley**

Inferences about causation could be drawn if a large sample of students had been randomly divided into various majors. But students are not sorted in this way, and the self-allocation of students across majors creates a great challenge for economists wishing to look at the effects of the majors themselves.

A lot of research has been devoted to overcoming the problem that selection bias creates for estimating the effect of choosing a major. A recent article in the *American Economic Journal: Applied Economics* by Zachary Bleemer of the University of California, Berkeley, and Aashish Mehta of University of California, Santa Barbara, has explored a new way to tackle the problem. Using data on students from the University of California, Santa Cruz, the researchers took advantage of the economics department's policy of preventing (or at least discouraging) students with low grades in introductory economics courses from declaring the major. The researchers were able to use the discontinuity between those above

and below the grade cutoff to draw inferences about the causal effect of an economics degree. They found, "Students who barely met the grade point average threshold to major in economics earned \$22,000 (46 percent) higher annual early-career wages than they would have with their second-choice majors."

Bleemer and Mehta's study strongly suggests that there is a good reason why the economics major is popular at U.S. universities. "Choosing what you study in college has dramatic ramifications for labor market success, and the economics major seems to provide very large wage returns for students," says Bleemer.

For Bleemer, the high returns to an economics degree magnify the significance of barriers that limit access to the major. Indeed, one of his main research goals is to better understand policies, such as the one at UC Santa Cruz, that restrict access. In another recent paper, "College Major Restrictions and Student Stratification," Bleemer and Mehta found, "Underrepresented minority (URM) college students have been steadily earning degrees in relatively less-lucrative fields since the mid-1990s." They found evidence of rising stratification at public research universities, many of which increasingly enforce GPA restrictions for entry into majors.

"We find that the restrictions on major access decrease Black and Hispanic enrollment by about 20 percent," says Bleemer. "There's been a roughly 25-year trend, which you can largely explain by the accelerating imposition of these restriction policies."

Whatever the pros and cons of such policies, their existence seems to attest to the economics major's continuing allure. It is a lucrative degree — for those who can get it. **EF**

BY KARTIK ATHREYA

## Following Through

**W**hile 2022 isn't over yet, it seems a safe bet that inflation will be one of this year's defining stories. Inflation measures have hit levels not seen in four decades. Nostalgia for the 1980s may be riding high, as evidenced by the success of *Top Gun: Maverick* at the box office, but the inflation of the early part of that era is not something we are eager to reexperience.

As I discussed in my last column, the Fed is taking steps to bring inflation back down to its 2 percent long-run target. This includes decisively raising its policy rates and letting the balance sheet shrink as well. (See "The Fed Is Shrinking Its Balance Sheet. What Does That Mean?" p. 4.) The Federal Open Market Committee has repeatedly stressed its commitment to stable prices and made clear that it has both the tools and the will to meet that commitment.

So far, market participants have confidence that the Fed will get inflation under control. One indicator of this is the five-year TIPS/Treasury Breakeven Rate, which provides a market-based measure of what investors believe inflation will be in the next five years. It has been trending down toward the Fed's 2 percent target since the Fed began tightening in the spring.

Still, actual inflation remains well above where the Fed would like it to be, so it is not surprising that some have questioned whether the central bank will make good on its pledge. After all, the Fed was always committed to keeping inflation low and stable, yet high inflation has now occurred. One could justifiably ask what we've learned and why the Fed should be trusted to get things right now.

I don't think anyone would dispute that monetary policymakers have had to navigate a challenging environment since the pandemic began. Economic data is noisy, lagged, and often contradictory even in the best of times. These issues become even more relevant in an environment of huge, unanticipated shocks, such as (what we hope is) a once-in-a-century pandemic and a war in Europe. But even bad luck can erode a central bank's credibility. With each unanswered shock, it becomes harder to convince the public that we are serious about price stability.

The issue can be viewed as one of making clear "who we are not." Namely, that the public should not perceive us as prone to renegeing on promises, lest we no longer be believed. In the wake of inflation, the trick is to ensure such beliefs are not unduly entertained. Yet how to do this is not obvious. Simply taking tough actions right now, while

heuristically appealing, does not transmit an unambiguous signal. While inflation is high, unemployment is extremely low — it's an easy call to tighten right now. So, time will tell if we are believed.

Still, the challenge the Fed faces now is not quite the same one it faced the last time inflation was this high. In the 1980s, the central bank not only had to deal with high inflation, it also had to reestablish the credibility it had lost in the previous decade. Like today, the 1970s were marked

by several unanticipated inflationary shocks, including the energy crises in 1973 and 1979. But the Fed compounded the inflationary pressures from these events by failing to follow through with the right policy. It tightened policy to address inflation — only to reverse course as the economy weakened, resulting in a stop-and-go monetary policy regime that, via the outcomes it produced, diminished the public's trust in the Fed's commitment to price stability. The lesson from that era is that it is not enough to communicate the right policy. Central banks are expected to follow through, something that may be tested when things get tough.

Happily, in 2022, the Fed isn't starting from scratch when it comes to its credibility. As I noted, there is substantial evidence that markets and households both believe that the Fed will bring inflation back down. Additionally, the Fed now has an explicit 2 percent inflation target to help anchor those expectations, something

it lacked in the 1970s. Lastly, the Fed is much more open and transparent about policy than it was four decades ago. Fed officials have clearly communicated their plan to tackle inflation and regularly update the public on their view of the economy as new data come in.

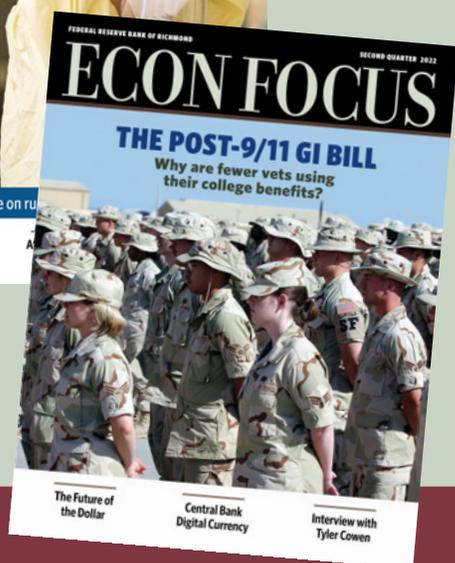
These are all reasons for some optimism, but they don't diminish the importance of following through. Fed Chair Jerome Powell has stressed that monetary policy is a blunt instrument and using it to bring down inflation could entail some short-term pain. This risk, though, must be compared with outcomes that would confront the Fed and the economy were clear action not forthcoming. Following through on its commitment to restoring price stability, even in the face of some pain, will help ensure the Fed doesn't end up in a position where it must rebuild its credibility entirely. History suggests that is a much more painful process. **EF**

**The public should not perceive us as prone to renegeing on promises, lest we no longer be believed. In the wake of inflation, the trick is to ensure such beliefs are not unduly entertained. Yet how to do this is not obvious.**

*Kartik Athreya is executive vice president and director of research at the Federal Reserve Bank of Richmond.*

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