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## Favoritism toward China's Former State-Owned Enterprises

China's two-decade push to privatize state-owned enterprises (SOEs) has created better-performing companies, but former SOEs still benefit from some forms of state support. These firms receive low-interest loans and subsidies more frequently, and in greater quantity, than other enterprises.

In **Can a Tiger Change Its Stripes? Reform of Chinese State-Owned Enterprises in the Penumbra of the State** (NBER Working Paper No. 25475), [Ann Harrison](#), [Marshall Meyer](#), [Peichun Wang](#), [Linda Zhao](#), and [Minyuan Zhao](#) find that the benefits for former SOEs became more pronounced after the 2008 global financial crisis, when the Chinese government launched a trillion-dollar stimulus package.

Former SOEs, while more innovative and slightly more profitable than currently state-owned firms, remain less innovative and profitable than Chinese companies that have always been in the private sector. "The tiger can change its stripes," the researchers conclude. "However, the government's behavior

seems to be sticky."

Using a dataset of all medium and large Chinese enterprises covering the period

SOEs enjoyed an even lower interest rate than the former SOEs.

Former SOEs also occupied the mid-

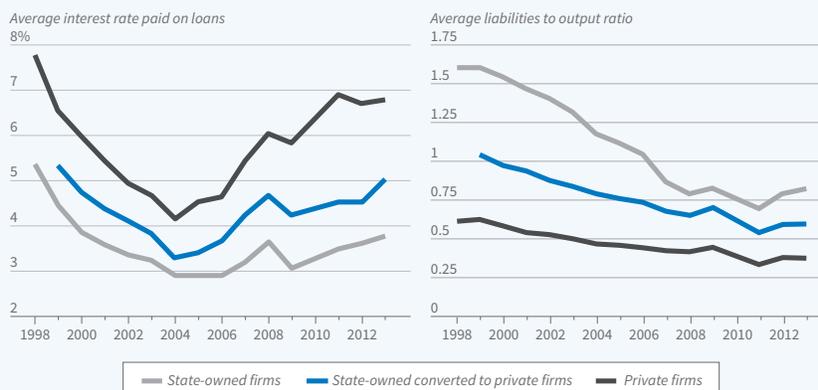
Currently state-owned firms receive more subsidies and lower interest rates than formerly state-owned firms, which in turn are favored relative to always-private firms.

from 1998 to 2013, the researchers find that, before the 2008 crisis, the interest rate on loans to private firms was more than one percentage point higher than that on loans to former SOEs. Post-crisis, the difference widened to two percentage points. Current

private firms received about 73 percent less in loans (as a share of output) than did SOEs, while privatized SOEs received 45 percent less. These disparities have narrowed over time.

The same held true for subsidies. In 1998, fewer than 15 percent of onetime SOEs got subsidies; by 2013, their share was 25 to 35 percent. For current SOEs, the comparable shares were 15 percent and 45 percent. Private enterprises, at 5 percent and 15 percent, were less likely to receive subsidies than either current or past SOEs. The size of the subsidies also varied. The average for private firms, per 1 million

Access to Capital for Former Chinese State-Owned Enterprises



Source: Researchers' calculations using data from the National Bureau of Statistics of China and the Dios Database

RMB of annual output, was 5,500 RMB less than for SOEs. Former SOEs received 3,600 RMB less than current SOEs.

All three kinds of companies improved return on assets (ROA) over the 1998–2013 period, but the size of improvement varied. Private firms started out with nearly a 10 percentage-point advantage in ROA over SOEs. The performance gap narrowed before 2004, but widened again after 2004. Former SOEs performed bet-

ter than current SOEs, but only slightly. The researchers also find evidence that moving from complete state ownership to complete private ownership boosted a firm's total factor productivity by about 1.5 percent.

Private firms were also more innovative than their state-owned counterparts. Private firms were 3 percent more likely, and former SOEs 2.5 percent more likely, per 100 million RMB in total assets, to

file a patent in any given year than SOEs.

The researchers further conclude that the difference in borrowing costs and subsidies between former SOEs and firms that have always been private is associated with an additional 104 to 113 percent in ROA, and an additional 8.6 to 9.6 percent probability that a firm would file for a patent, when compared to just the effect of ownership change.

—Laurent Belsie

## Employees See Wage Gains when Small Firms Win Patents

Whether workers' wages are mostly determined by the value of what they contribute to the firm they work for, with little room for negotiation, or whether they in substantial part reflect a division of profits, or "rents," between the two parties, is a long-standing and fundamental question in labor economics. There is substantial variation in the wages that workers with similar characteristics, as measured on economic surveys, earn at different firms. A growing body of research suggests that such inter-firm wage differences are an important contributor to overall wage dispersion in the U.S. economy.

In **Who Profits from Patents? Rent-Sharing at Innovative Firms** (NBER Working Paper No. 25245), [Patrick Kline](#), [Neviana Petkova](#), [Heidi Williams](#), and [Owen Zidar](#) examine how worker compensation relates to firm performance before and after a firm is awarded a patent. They compare worker outcomes at firms whose patent applications were initially accepted to outcomes at firms whose applications were initially rejected.

The researchers find that firms granted high-value patents enjoy rapid increases in size and improvements in performance. A top-quintile patent is associated with a 22 percent expansion and about \$37,000 in additional revenue for each worker at the time of the patent award. Average earnings rise by approxi-

mately \$3,700 per employee per year; worker pay plus the company's earnings before interest, taxes, and depreciation

quartile of the firm's wage distribution, and among workers who were employed by the firm during the year of the patent

The increase is concentrated among earners in the top quartile of the firm's wage distribution, and those who were employed by the firm during the year of the patent application who stayed on in subsequent years.

rise by about \$12,400 per employee.

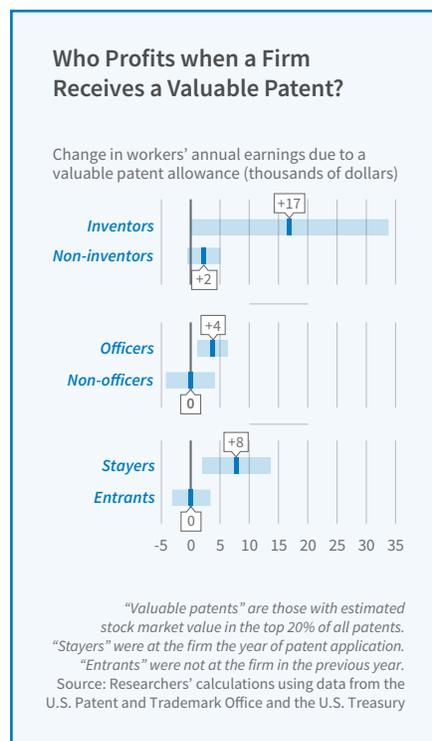
This increase in employee earnings is concentrated among earners in the top

application and remained at the firm in subsequent years. These "stayers" enjoy an earnings boost of about \$8,000 per year after the initial patent allowance, while employees who leave see no such boost. Inventors see their earnings increase by \$17,000 a year, while non-inventors see only a \$2,000 boost.

One way of quantifying the magnitude of these estimates is to say that a \$1 increase in surplus due to a patent award results in a 61 cent average earnings increase for stayers and a 29 cent increase for all workers. Worker retention rates also increase more among the groups of workers that enjoy the largest earnings boost.

The researchers conclude that their findings are consistent with the theory that employers engage in rent-sharing, passing some of the economic rents produced by high-value patents through to workers, with the most valuable workers — those who would be most expensive to replace — capturing the largest proportion of these gains.

—Dwyer Gunn



# Employment Growth and Rising Women’s Labor Force Participation

Recent economic recoveries have been characterized by slow employment growth. Various explanations have been suggested for this pattern, including labor market restructuring that creates mismatches between workers and job openings, and firms using existing workers for longer hours rather than hiring new ones following a downturn.

In **Women, Wealth Effects, and Slow Recoveries**, (NBER Working Paper No. 25311), Masao Fukui, Emi Nakamura, and Jón Steinsson find that much of the slowdown in employment growth during recoveries can be traced to slower growth in female employment. A four-decade influx of women into the labor market, the “Grand Gender Convergence,” saw the rate of female participation in the labor market approach that of men. The speed of this convergence peaked in the 1970s and by 2000 the gender gap had plateaued. The researchers estimate that 70 percent of the slowdown in employment growth during recoveries is due to this factor.

In 1970, 93 percent of prime-age men in the U.S. were employed, compared to just 48 percent of women. By 2016, the employment rate for women had risen to 71 percent, while the rate for men had declined to 85 percent.

A central question for analyzing the impact of rising labor force activity of women is whether the addition of millions of female workers to the labor market reduced male employment

rates. Standard macroeconomic models imply that such crowding out is large. The researchers observe that, to answer this question, it is important to recog-

roles in the workforce.

The researchers estimate the extent to which rising female labor force participation crowds out male participa-

Much of the slowdown in employment growth during economic recoveries in recent decades is due to slowing growth in women’s labor force participation.

nize “home production,” the non-market production of goods and services that households do for their own con-

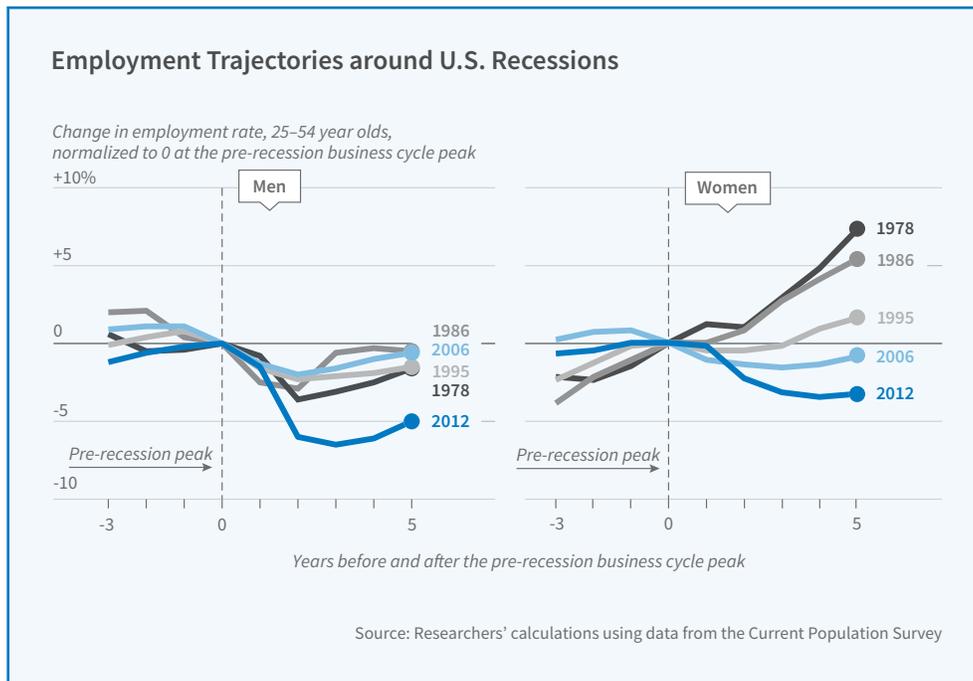
tion using state-level labor market data, since states experienced the gender convergence at different rates depending

on how large a gender gap they had to begin with. States with a large gap between female and male employment-to-population ratios in 1970 experienced more rapid growth in female employment rates over the next four decades. By 2016, there was little variation across states. A key finding is that virtually all of the convergence across states arises from a more rapid increase in female employment

rates in states that start low, not from a decline in male employment rates in those states. The trajectory of the male employment rate is not strongly related to the initial gender gap.

The researchers use their estimates of crowd-out to investigate what the last half-century of business cycles would have looked like had the rapid growth in female entry into the labor market continued rather than slowed down. They find that recoveries would have been significantly faster following recent recessions.

—Anna Louie Sussman



sumption. Women who are not in the labor market are often actively engaged in home production, and when they enter the labor force, their household’s demand for market goods and services is likely to rise. This helps to explain why, as women have joined the labor market in large numbers, the male employment-to-population ratio has stayed relatively constant. It can also account for the findings from time-use data that women’s leisure time has increased over the past 50 years. This would not be the case if women were going from an idle life of leisure into newly productive

# Test-Related Stress and Student Scores on High-Stakes Exams

Standardized tests are widely used to gauge student capabilities and inform educational programming. Test scores can also shape the academic destinies and careers of students. Their importance can generate stress among test-takers.

In **Testing, Stress, and Performance: How Students Respond Physiologically to High-Stakes Testing** (NBER Working Paper

No. 25305), Jennifer A. Heissel, Emma K. Adam, Jennifer L. Doleac, David N. Figlio, and Jonathan Meer document that students' level of a stress hormone, cortisol, rises by about 15 percent on average in the week when high-stakes standardized tests are given.

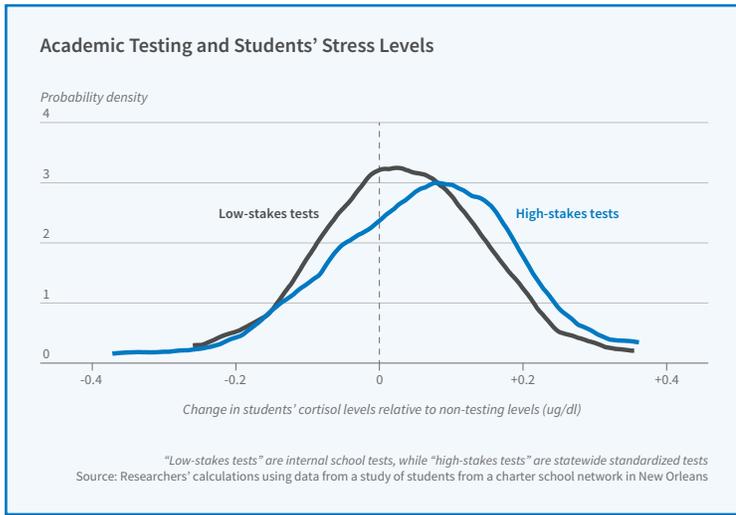
The study analyzes administrative data, student diaries, and saliva samples of New Orleans students in grades 3–8 in the 2015–16 academic year. Most students in the study were low-income African Americans, but they hailed from different areas of the city, with different levels of wealth and crime. The students took saliva samples during different periods of the year, which allowed the researchers to compare cortisol levels in weeks with and

without high-stakes tests.

The increase in cortisol in test weeks is largely the result of a sharp increase—35 percent on average—for male students. There are no substantial changes for females between testing weeks and other weeks. The researchers also find larger increases in cortisol for students from neighborhoods with higher poverty rates, and larger numbers of 911 calls, although the evidence is not conclusive.

Large spikes in cortisol levels can lead to a lack of focus, recall, and ability to perform tasks. The researchers compare the test scores of students who showed a cortisol increase or decrease of more than 10 percent in the test week relative to the no-test week, and those whose cortisol level was similar across weeks, controlling for expected academic performance. Such a rise or fall in cortisol is associated with a 0.4 standard deviation decrease in the test scores—the equivalent of a drop of approximately 80 points on the 1600-point SAT scale. These findings suggest that for some students, physiological reactions to test-taking may diminish their scores.

—Jay Fitzgerald



# Child Access Prevention Laws and Firearm-Related Homicides

In attempts to curb gun violence by young people, who often use unsecured firearms from their homes, 27 states and the District of Columbia have adopted safe-storage laws designed to restrict juvenile access to guns. These “child access prevention” (CAP) laws vary from state to state in severity of penalties and assignment of liability.

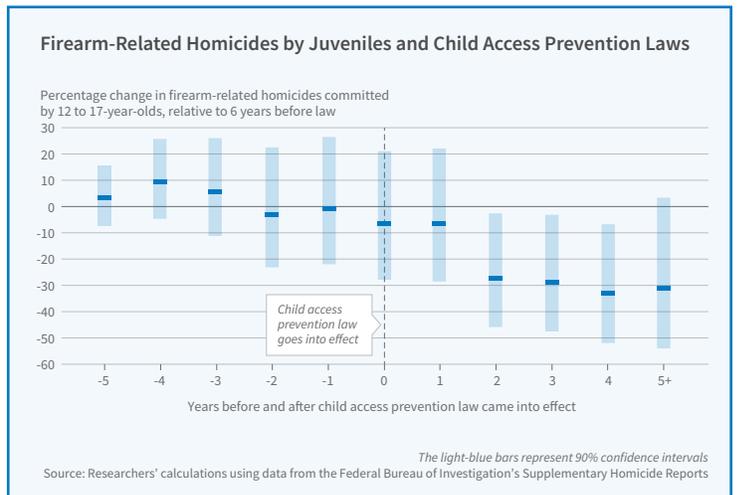
In **Child Access Prevention Laws and Juvenile Firearm-related Homicides** (NBER Working Paper No. 25209), D. Mark Anderson, Joseph J. Sabia, and Erdal Tekin analyze FBI crime data from the Supplementary Homicide Reports for the period 1985–2013. They find that, after allowance for differences across states in homicide trends before the laws were enacted, CAP laws are associated with a 19 percent reduction in firearm-related homicides among 12- to 17-year-olds. Without controls for state-specific trends, the drop in juvenile homicides is even larger. The effects are

largest in states with a “negligent storage” standard, which is the strictest form of CAP legislation. In negligent-storage states, an individual who allows a minor access to an improperly stored gun can face criminal prosecution. The researchers find larger effects of CAP laws on white than on black youth.

The researchers carry out several tests for a spurious correlation between the passage of CAP laws and homicide rates. They find no evidence that CAP laws are associated with a decline in firearm-related homicides committed by adults, or with non-firearm-related homi-

cides committed by juveniles. These results lend credence to their conclusion that enacting CAP laws reduces juvenile firearm-related homicides because these laws restrict gun access, and not because they are associated with other factors.

—Jay Fitzgerald



# Attracting Low-Income Students to Top Universities

A new Michigan initiative suggests a low-cost way for highly selective universities to attract economically disadvantaged, academically gifted students, who historically have been unlikely to apply.

In **Closing the Gap: The Effect of a Targeted, Tuition-Free Promise on College Choices of High-Achieving, Low-Income Students** (NBER Working Paper No. 25349), [Susan Dynarski](#), [C.J. Libassi](#), [Katherine Micheltore](#), and [Stephanie Owen](#) analyze a pilot program that more than doubled the likelihood that students eligible for full-tuition scholarships would enroll at the University of Michigan.

Two-thirds of high school students involved in the pilot program applied to the university, compared with only a quarter of similar students in a control group. The share of those in the program who ultimately enrolled at the university was 27 percent, compared with 12 percent from the control group.

Nationwide, 12 percent of college students come from families in the bottom fifth of the income distribution, while 28 percent are from the top fifth. At many of the most selective schools, more students come from the top 1 percent than from the bottom 50 percent. A majority of low-income, high-achieving students do not apply to selective schools due to some combination of uncertainty about their suitability for an elite school, overestimation of what such a school would cost, and procedural barriers.

The Michigan program, known as the HAIL (High Achieving Involved

Leader) Scholarship, encouraged students to apply through personalized mailings, notifications to parents and school principals of eligible students,

A pilot program finds that high achievers who wouldn't otherwise apply to the University of Michigan can be encouraged by outreach, information, and assurances of a full tuition scholarship.

and an explicit promise of four years of free tuition and no obligation to file financial aid forms. In most cases, if the students did fill out and submit the financial aid forms, they could receive more aid.

juniors in 2015 and 2016. Eligible students were identified based on whether they received free or reduced-cost school meals and had achieved high SAT scores

and grade-point averages. All Michigan high school students are required to take the SAT, boosting the pool of potential low-income college applicants. Students in the control group attended different high schools than those targeted by the

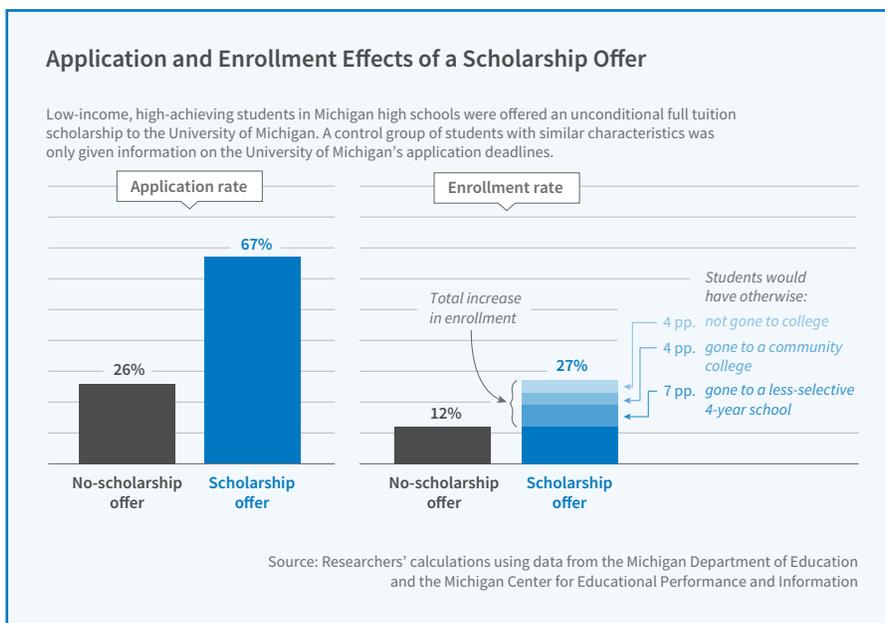
program. In all, 4,000 students were monitored over the two-year pilot.

The program had its largest impact among students living in rural areas and communities farthest from the University of Michigan. In the control group, low-income black students — who tend to live in urban areas — were twice as likely to apply and enroll in the University of Michigan as were white and Asian students, who were more

likely to be from rural communities. Intervention with the HAIL Scholarship equalized the outcomes across racial groups. The program also narrowed the application gap between men and women.

The study found that the effects of the program persisted once students entered the University of Michigan, with those offered the HAIL Scholarship 13.5 percentage points more likely than those in the control group to continue for a second year.

—Steve Maas



The four-year commitment assured families that their student was eligible for aid from a competitive college and relieved them of uncertainty over whether the scholarship would continue. Students were notified of their eligibility via a heavy, large, glossy package in the colors of the University of Michigan. This made it difficult to ignore the mailing and enhanced its legitimacy. The packages, which cost the program about \$10 each, included a personalized letter from the university president.

The study focused on high school

# Retail Investors Reach for Income when Interest Rates Fall

Standard theories in financial economics hold that investors should be indifferent to whether income accrues from dividends or from capital gains as long as there are no tax differences and capital markets are frictionless. The actual behavior of retail investors appears to be inconsistent with this prediction. In **Monetary Policy and Reaching for Income** (NBER Working Paper No. 25344), Kent Daniel, Lorenzo Garlappi, and Kairong Xiao show that some retail investors have a demand for income streams like those provided by the interest payments on bonds and the dividends on corporate stocks. When interest rates fall, they adjust their portfolios to include a higher fraction of stocks that pay high dividends.

The researchers study how household portfolios adjust in the aftermath of federal funds rate changes.

They analyze individual portfolio holdings at a large discount broker over the period 1991–96 for 19,394 households. They merge portfolio data with the Center for Research in Security Prices (CRSP) stock database, and determine income and pricing for the stocks in each individual portfolio. The average dividend yield of the stocks in the sample was 2.1 percent. “High income yield” stocks were those with dividend yields above the 90th percentile, or 5.7 percent.

The study also uses the CRSP Survivor-Bias-Free U.S. Mutual Fund Database, which

provides mutual fund income yields, asset flows, returns, size, expenses, and volatility from January 1991 to December 2016, to analyze rotations of fund flows following a decrease

find a 5.2 percentage point increase in inflows to equity mutual funds with high income yields. These results suggest that an accommodative monetary policy may reduce portfolio diversi-

A one percentage point drop in the federal funds rate is associated, over the following three years, with a 5 percent increase in the inflows to stock mutual funds with high income yields.

in the federal funds rate. The average yield of equity mutual funds was 1.3 percent and the yield at the 90th percentile was 2.8 percent.

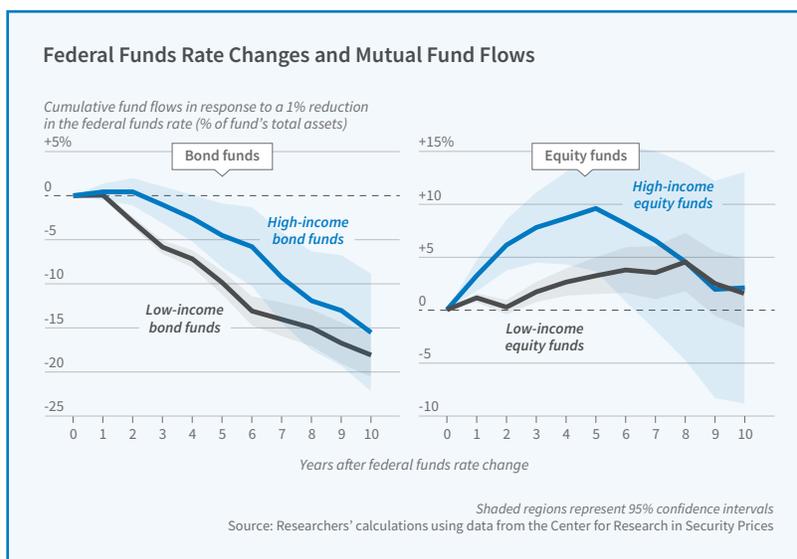
In the six months after a 1 percentage point

fication and increase the value of high dividend stocks relative to low dividend stocks.

To disentangle monetary policy changes from other economic changes, the researchers compare changes in holdings of individual stocks by households in different Metropolitan Statistical Areas. They find that demand for dividends was negatively related to local area bank deposit rates, suggesting that local bank deposit rates “provide a more accurate measure of available sources of income for local investors than the Fed Funds rate.”

The researchers suggest that reaching for income can be an optimal investment strategy if investors try to discipline themselves by restricting their spending to the income from their portfolios. It appears that the investors who reach for income are disproportionately those with low labor income, such as retirees.

—Linda Gorman



drop in the federal funds rate associated with accommodative monetary policy, households raise the share of their portfolio in stocks paying high dividends by 0.95 percentage points. Over the following three years, the researchers

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