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INSIDE THIS ISSUE

Does Creative Destruction Really Drive Economic Growth?

Creative destruction is often seen as the primary engine of growth in the modern economy. Upstart businesses generate profits and jobs, the theory suggests, by introducing new goods that displace existing products or by devising innovative ways to improve on the products of competing firms.

That view of progress is challenged in **How Destructive Is Innovation?** (NBER Working Paper No. 22953). Researchers Daniel Garcia-Macia, Chang-Tai Hsieh, and Peter J. Klenow argue that, while creative destruction plays a vital role in driving economic growth, it is not the dominant force. They find that creative destruction only accounts for about 25 percent of growth, with most of the remainder coming from refinements that established firms make to their own products.

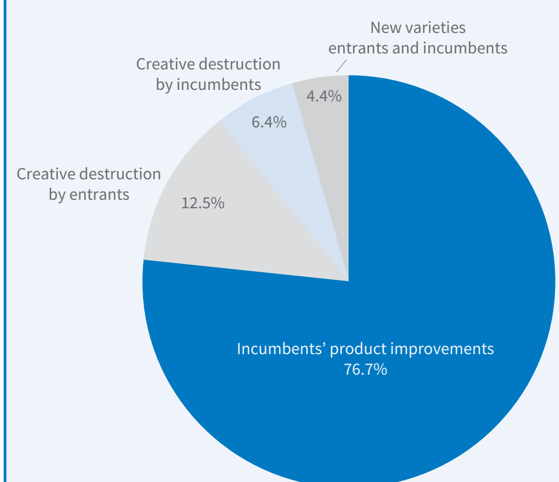
The study examines patterns of job creation and job destruction among private sector firms in the American nonfarm economy, using the U.S. Longitudinal Business Database (LBD) from 1976–86 and 2003–13. The analysis focuses on employment shifts that are a by-product of innovation, which, in contrast to earlier work that focused on patents in the manufacturing sector, allows the researchers to study the entire nonfarm private sector.

The researchers assume that new firms — companies less than five years old — initially offer a single product which they obtain by improving upon an existing product or creating a new variety, while established firms potentially accumulate and produce multiple varieties. They note that the various types of innovation are all sources of growth and attempt “to illustrate how they might leave different telltale signs in the microdata.”

> Incumbent firms’ improvements on their own products appear to be more important than creative destruction by innovative startups as sources of growth.

The researchers argue that the role of entrants should be tied to the employment share of young firms. Creative destruction should show up as large employment declines (and, in the extreme, exit) among some incumbents and major growth among those doing the destroying: it should show up in the tails of the distribution of employment changes across firms. In contrast, when incumbents improve their own products, there should be much smaller changes in firm employment. Think of a retailer upgrading an outlet as opposed to opening a new store and driving out a competitor. Incremental innovations within firms are likely to show up as employment changes in the middle of the job growth distribution — precisely where many changes are found.

Sources of Product Innovation, 2003–2013



Source: Researchers’ calculations using U.S. Longitudinal Business Database

While creative destruction is vital for explaining extreme employment declines and exit, most employment changes, even over five-year periods, are much more modest. The researchers therefore conclude that most innovation takes the form of incumbents improving their own products. They show that the relative contributions to growth by new entrants to the market declined from 1976–86 to 2003–13, as did all growth attributable to creative destruction. But the growth contributions of existing firms — particularly through improving their own goods — rose. Most growth seems to occur as a result of quality improvements rather than the development of new varieties.

Between 1976 and 1986, about 27 percent of growth could be attributed to creative destruction, well below the 65 percent that resulted from improvements established companies made to their existing products. The remaining 8 percent was from the generation of new varieties of existing products.

From 2003 to 2013, creative destruction accounted for 19 percent of growth, compared with 77 percent from product improvements by existing firms. New varieties of products accounted for 4 percent of growth in this period.

Only a modest proportion of job growth comes from new firms, which supports the researchers' conclusion that most growth comes from established firms rather than new entrants. The employment share of new firms averaged 22 percent during the period 1976–86, but was 7 percentage points lower, 15 percent, during 2003–13. The job creation rate in total fell by 12 percentage points between those two periods. More than half of that decline was due to the drop in the employment share of the new firms, reflecting less innovation by them.

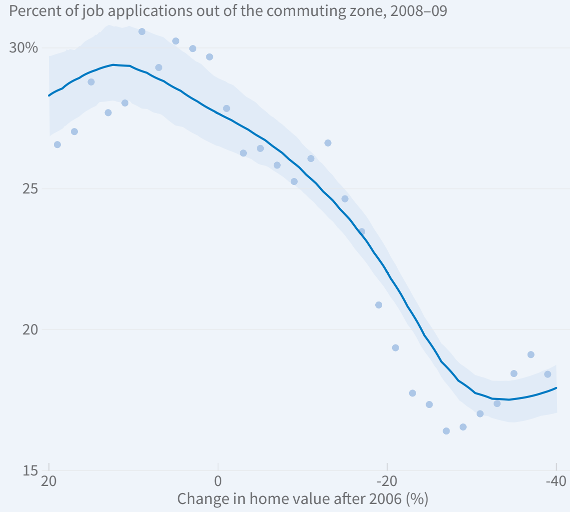
—John Laidler

Housing Crisis Boxed in Some Job Seekers

The housing crash of 2007–08 devastated many homeowners who suddenly found themselves facing an array of woes, from owning homes no longer worth the purchase prices to keeping up with mortgage payments amidst one of the worst recessions in generations. In **Locked in by Leverage: Job Search During the Housing Crisis** (NBER Working Paper No. 22929), Jennifer Brown and David A. Matsa find that being underwater on a mortgage in a distressed housing market impeded the job searches of these homeowners by reducing their mobility. By constraining job search, this reduced mobility likely damaged their long-term compensation and career prospects.

Change in Home Value and Job Search Concentration

Percent of job applications out of the commuting zone, 2008–09



Shading represents 95% confidence intervals

Source: Researchers' calculations using data from Zillow, CoreLogic, and others

Housing-market downturns can devastate homeowners' overall wealth, and lower housing values can actually "lock in" owners who can't sell their homes with negative equity, forcing them to remain in their homes and limiting their mobility to buy homes and find work elsewhere. But little is known about how a housing bust specifically affects labor supply, largely because it's difficult to separate effects on labor supply and on labor demand.

These researchers studied the crash's effect on job searches. With data from a large online job search platform, they analyzed more than four million applications to 60,000 online job postings in the financial services sector between May 2008 and December 2009. The data encompassed a rich array of jobs, including posts for bank tellers, administrative assistants, software engineers, account executives, and financial advisers. The postings were spread across all 50 states, 12,157 ZIP codes and more than 700 commuting zones.

The researchers matched information from the job search platform to housing market data. Monthly estimates of home values and borrowing were drawn from Zillow and CoreLogic's Loan-Level Market Analytics, while labor market data came from the U.S. Bureau of Labor Statistics and the Bureau of the Census.

> Owning homes in distressed housing markets reduced job seekers' mobility, damaging their long-term career prospects.

Home value declines and the presence of negative equity led job seekers in depressed housing markets to apply for fewer jobs that required relocation; a 30 percent decline in home values led to a 15 percent decline in applications for jobs outside of the job seeker's commuting zone.

When job searchers were constrained geographically due to the "lock in" effect of lower home values, they were more likely to apply for lower-level and lower-paying positions within their commuting zone.

This constrained search pattern was particularly pronounced in distressed housing markets with recourse mortgages, which allow lenders to go after a defaulting homeowner's other assets. The researchers found clear job-search differences in border areas in which one state allowed recourse mortgages and the other did not.

From the standpoint of firms, the constrained search of some prospective workers had two effects. Firms had reduced access to a national labor market if millions of Americans couldn't or wouldn't relocate due to housing value concerns. At the same time, firms within distressed housing markets faced less competition for labor and benefited by being able to hire well qualified workers at lower salaries than they might otherwise have had to offer.

The researchers conclude that the housing market has important effects on the labor market, as "workers who accept positions below their skill or experience levels forego opportunities to build their human capital." They note that those forced to seek lower-level jobs than they would typically consider could also crowd out other workers, who in turn suffer, creating a far-reaching labor market ripple effect "even if housing market constraints are short-lived."

—Jay Fitzgerald

Competition from China Reduced Domestic Innovation

While much attention has been paid to the impact of Chinese imports on U.S. factory employment, relatively little has been focused on other affected areas, such as innovation by American manufacturers.

In **Foreign Competition and Domestic Innovation: Evidence from U.S. Patents** (NBER Working Paper No. 22879), David Autor, David Dorn, Gordon H. Hanson, Gary Pisano, and Pian Shu compare firm-level data on patents obtained in the period 1975 to 1991 — before the surge in Chinese imports — with data for the period 1991 to 2007. They find that while patent output and exposure to trade were not significantly correlated in the earlier period, they were in the latter.

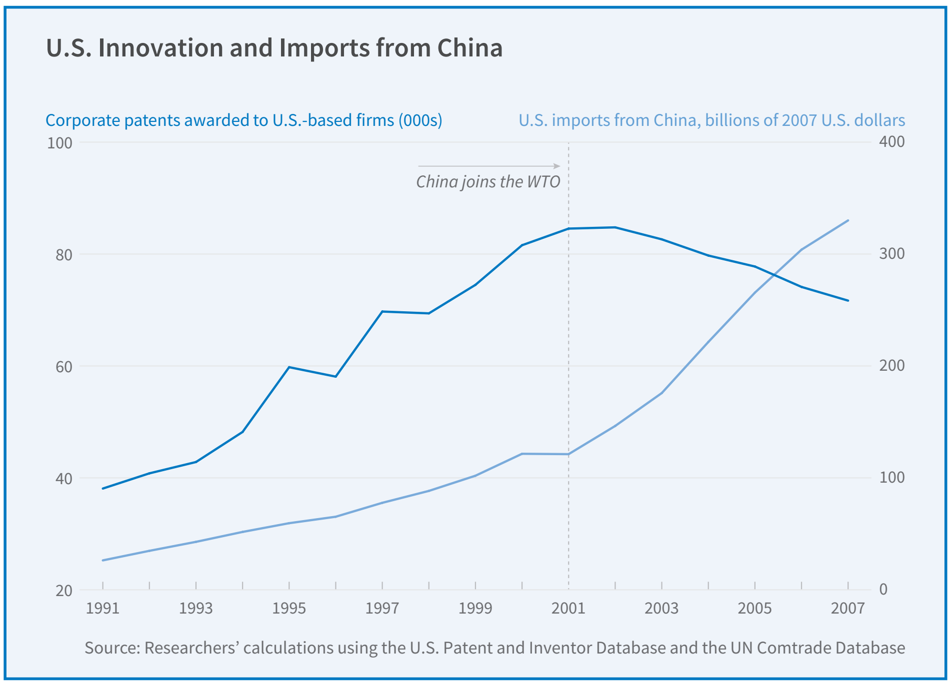
China's exports made up nearly 19 percent of the world's total in 2013, up from just 2.3 percent in 1991. The study finds that corporations in U.S. industries where the Chinese made their greatest inroads experienced the most pronounced decline in innovation.

The researchers use patents as their main proxy for innovation, but the study's conclusions are corroborated by corresponding trends in research and development spending. Corporations tightened their belts across the board as imports eroded revenues. There was no association between rising imports and patents generated among entities relatively immune to international market forces, such as universities, hospitals, and nonprofit research institutions.

In conducting their study, the researchers controlled for other factors that could influence the rate of patent generation, such as the post-2001 dot-com bust, a trend toward greater scrutiny of patent applications, and pre-existing trends in the rate of patenting in key industries.

The study's long-term perspective, using data from 1975 to 2007, reveals a growth trend in patenting in the computer and electronics industries and a trend of stagnation of patenting in chemicals and pharmaceuticals, which are two of the most important sectors for innovation.

> Corporations in U.S. industries in which the Chinese made their greatest inroads reduced R&D spending and produced fewer patents.



Both of these trends *predate* the surge in Chinese import competition of the 1990s and 2000s, which was much stronger in the computer and electronics industries than in industries that create new chemical patents.

Given the countervailing trends in these two large, patent-intensive sectors, simple correlations would suggest — misleadingly, it turns out — that industries with larger increases in trade exposure during the sample period of 1991 to 2007 did not exhibit significant falls in patenting. Once the researchers account for preexisting trends in just these two sectors — computers and chemicals — the adverse impact of trade exposure on industry patenting becomes strongly apparent and can be precisely estimated.

While manufacturing employs less than a tenth of U.S. private nonfarm workers, it accounts for two-thirds of the country's research and development spending and corporate patents. "The relationship between competition in the global marketplace and the creation of new products and production processes is thus one of immense importance for the U.S. economy," they write.

The researchers ask why corporations do not spend more on innovation in the face of mounting Chinese imports. One possibility is that firms assume increased competition will lead to a permanent decline in the profitability of their market sectors, giving them little incentive to invest. Another is that American consumers, accustomed to low-cost Chinese goods, have become less inclined to pay more for innovative alternatives. A third possibility is that as American companies shifted their factories to lower-cost countries while keeping R&D at home, the geographic separation impeded the coordination that helps fertilize innovation.

"Each explanation has important implications for both policy and our understanding of the impact of trade on economic performance," the researchers conclude.

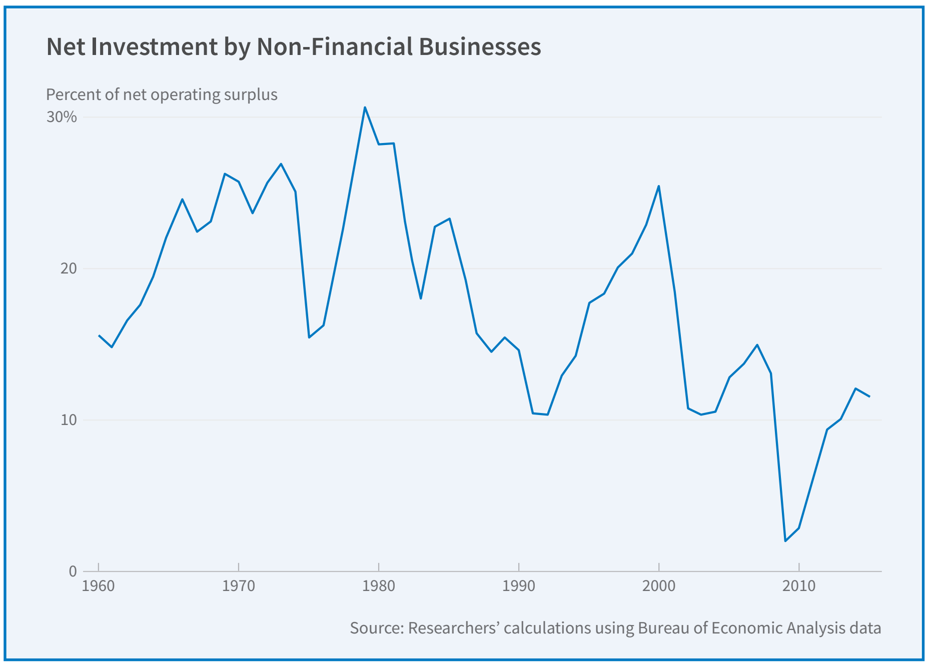
—Steve Maas

Explaining Low Investment Spending

Private investment has been weak in recent decades, in contrast with past relationships between measures of profitability, company valuation, and investment spending.

In **Investment-Less Growth: An Empirical Investigation** (NBER Working Paper No. 22897), Germán Gutiérrez and Thomas Philippon examine the determinants of investment at both the industry and firm levels, with the goal of explaining the recent experience.

The researchers note that while investment averaged about 20 percent of corporate operating revenues between 1959 and 2001, it has averaged only 10 percent in the period 2002 to 2015. The low level of investment spending is inconsistent with explanations of investment that focus on the ratio of a company's market value, as measured by the value of its outstanding equity and debt, and the replacement cost of its assets. The late James Tobin first suggested the relationship between investment and this ratio, which is sometimes called "Tobin's Q." In recent years, Q has been high but investment has been low.



The researchers argue that this simple observation rules out a whole class of theories, including theories of increased risk aversion or decreases in expected growth. They then test eight alternative theories that they believe could explain the investment gap, including measures of financial frictions, measurement error (due to the rise of intangibles such as globalization), decreased competition, and tightened governance and/or increased short-termism. They conclude that 80 percent of the recent decline in investment can be explained by two factors: less competitive markets and increased ownership of stock by institutional investors. Imprecise measurement of intangible assets, such as goodwill, may account for some of the remainder.

> Declining product market competition and rising stock ownership by institutions can help explain falling corporate investment rates.

The study measures competition by the number of firms in an industry and by sales and market value concentration. The researchers review data from the Census Bureau and corporate reports, and highlight several trends that suggest that competition may be decreasing in many economic sectors. These include a decades-long decline in new business formation and increases in industry-specific measures of concentration.

The researchers acknowledge that the relationship between competition and investment is complicated, but they argue that under a range of plausible assumptions, competition is likely to be positively associated with innovation and investment. Firms in concentrated industries, aging industries, and/or incumbents that do not face the threat of entry might have weak incentives to invest.

With regard to changes in the composition of share ownership, the researchers focus on quasi-indexers, which include institutions that have diversified holdings and low portfolio turnover. These investors currently account for 60 percent of institutional ownership, and their ownership share has grown significantly since 2000.

Why would ownership by quasi-indexers reduce investment? The researchers suggest that because quasi-indexers tend to be comparatively passive investors, the firms that they hold may be more vulnerable to the concerted efforts of activist investors. Executives may react to activists by focusing on short-term goals at the expense of a firm's long-term health, cutting back on investment to improve the bottom line or plowing profits into stock buybacks in the hope of boosting share price.

The study shows that firms with more quasi-indexer ownership do more buybacks. On the other hand, it finds no evidence that difficulty in obtaining financing accounts for lower investment rates. Firms with strong credit ratings — which would be expected to have continuing access to credit from both banks and the stock market — halved their investment from around 12 percent in the 1970s and 1980s to 6 percent after 2000.

The researchers caution that it is very difficult to establish causality between competition, stock ownership and governance, and investment, but they regard their findings as suggesting potential explanations for the recent experience.

— Steve Maas

Bureaucratic 'Churn' after Presidential Elections

When a new administration comes to town, it's not just the old President and his political appointees who leave — many senior career federal employees go too. That's especially true for those who work in agencies whose existing policies clash with those expected of the new President, according to **Elections, Ideology, and Turnover in the U.S. Federal Government** (NBER Working Paper No. 22932). The findings challenge the view that civil service bureaucrats provide stability and continuity for government operations as elected leaders come and go.

Using Office of Personnel Management records of 3.5 million federal employees between 1988 to 2011, spanning four presidential transitions, Alexander Bolton, John M. de Figueiredo, and David E. Lewis find that turnover rates for career federal employees are higher in the first few years of a new administration than at other times.

The increase in the turnover rate after the start of a new administration is most pronounced for career senior executives. This rate increases by 20 percent (1.6 percentage points) over the rate in other years. Supervisory employees also are more likely to leave after a new administration takes office, but their turnover rate only rises by 3.6 percent (0.2 percentage points) for the first post-election year.

"To put this in perspective, this would mean the departure of an additional 528 supervisors and 100 members of Senior Executive Service (SES) per year," the researchers report. "These are officials at the very highest levels of government," filling roles such as the Director of Counterintelligence at the Department of Homeland Security and the Director of Ground and Drinking Water at the Environmental Protection Agency (EPA).

The study also finds that in contrast to the turnover patterns for senior civil servants, lower-level government executives are less likely to leave in the first year of a new presidency than in other years.

"With high levels of churn in the career SES during the beginning of a new administration, there may be new opportunities for promotion for individuals directly below the Senior Executive Service level, leading General Schedule 13–15 employees to stay in the government to vie for these new openings," the researchers say.

Over the first three years of a new administration's term, although turnover declines for lower-level civil servants overall, it rises for those who work for agencies that appear to exhibit ideological clashes with the new administration's point of view. The researchers use expert ratings of agency ideology to develop a measure of the congruence between the agency's mission and the president's agenda. Agencies such as the EPA and the Department of Labor are considered in dissonance with the agenda of Republicans while agencies such as the Department of Defense are considered unaligned with Democrats. For employees at such agencies, the increase in turnover is highest for the SES

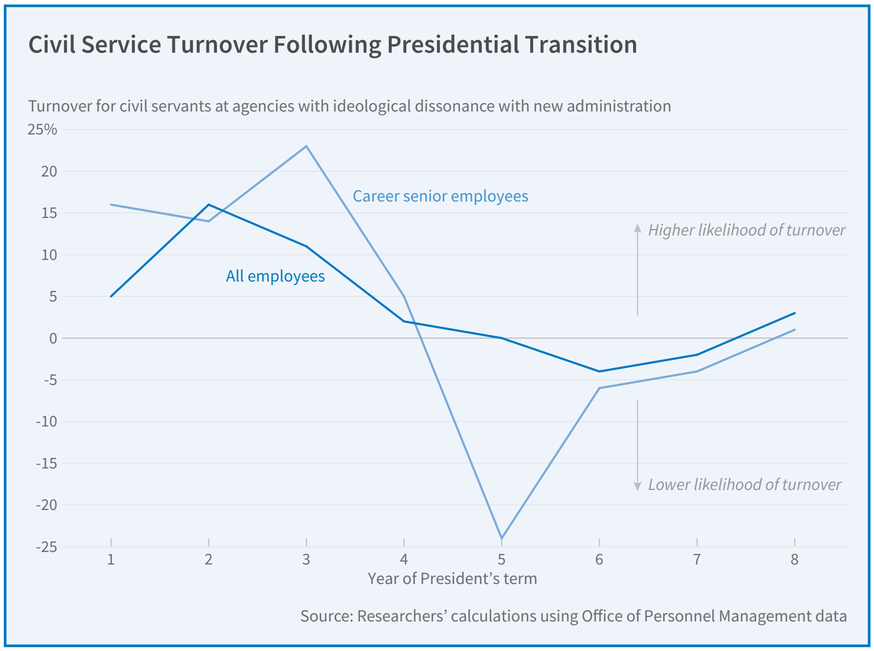
Turnover rates for career federal employees are higher in the first few years of a new administration than at other times, particularly among senior executives.

civil servants, ranging from an additional 13 percent to 23 percent (1.1 to 1.8 percentage point) annual turnover in the first three years, or the loss of an additional 300 SES employees in ideologically separated agencies. The ideological effect is smaller for all employees, ranging from 5 percent to 16 percent (0.3 to 1.0 percentage point).

"This effect is particularly large in the first three years of an administration and for the group of employees that has the most direct contact with the administration — career senior executives," the researchers find. "This suggests that political disagreements can lead to churn at the top of the career civil service . . . . In this way, elections and partisan changes can have important impacts on the career concerns of federal employees and potentially affect the capacity of organizations."

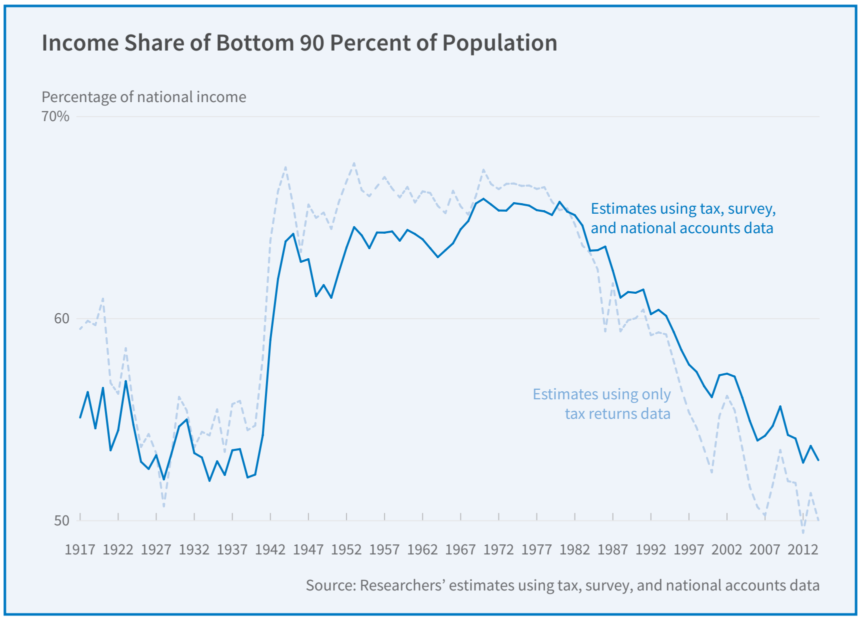
The researchers find that the period of elevated turnover lasts for about three years. After five years, at the start of a second term, the effect actually reverses, and the turnover rate is noticeably lower for career civil servants in those years relative to all others. Civil servants who have remained through a President's first term are particularly unlikely to leave when that President wins re-election. The researchers note this pattern, and write that "though our theory does not shed light on this result, it could suggest that, in some cases, career employees are more empowered by political appointees the longer they remain with an administration."

— Laurent Belsie



New Evidence on Income Inequality

Income inequality in the United States, measured using the cash income sources that are reported on income tax returns and analogous data from household surveys, has surged since 1980. But the total flow of income reported by households in survey or tax data adds up to barely 60 percent of the U.S. national income. In **Distributional National Accounts: Methods and Estimates for the United States** (NBER Working Paper No. 22945) Thomas Piketty, Emmanuel Saez, and Gabriel Zucman combine tax, survey, and national accounts data to create inequality statistics that capture 100 percent of U.S. national income. The researchers compute the distribution of both pre-tax and post-tax income. Post-tax series deduct all taxes and add back all transfers and public spending, so that both pre-tax and post-tax incomes add up to national income. This allows them to provide the first comprehensive view of how government redistribution affects inequality.



In 1980, the bottom half of the income distribution received about 20 percent of national income; by 2014, that share had declined to 12 percent.

Average pre-tax income for the bottom 50 percent of the income distribution has stagnated since 1980 at some $16,000 per adult per year, and the income of the top 1 percent of the distribution has increased sharply. In 1980, adults in the top 1 percent averaged 27 times the income of those in the bottom 50 percent; today, they average 81 times that income.

The researchers also find that rising income from investments rather than rising income from work has fueled the surge for the top 1 percent since 2000, and that the influx of women into the workforce has helped tamp down inequality.

The share of pre-tax national income accruing to the top 10 percent has grown less since 1980 than Piketty and Saez estimated previously, in a study using data from tax returns. This implies that the bottom 90 percent have done somewhat better than previously thought. While tax return data suggest that the average pre-tax income of this group declined by 0.1 percent per year, the new analysis using more comprehensive data shows that it actually grew by 0.8 percent a year. That still lags average income growth of 1.4 percent a year, and stands in contrast to the 1946 to 1980 period, when the bottom 90 percent's income grew about 2 percent a year, the same growth rate as average income. Average pre-tax national income for middle-class adults — with income between the median and the 90th percentile — has grown 40 percent since 1980, faster than previously estimated.

The researchers find that the redistribution of income through transfer programs has offset only a small fraction of the increase in inequality.

The stagnation of incomes for households in the bottom 50 percent is particularly noteworthy given the growth for those in the top 1 percent. In 1980, the bottom half received about 20 percent of national income; by 2014, their share had declined to 12 percent. For the top 1 percent, the picture is exactly the reverse: In 1980, they received 12 percent of national income; in 2014, they received 20 percent. Although transfers have increased through Social Security and other programs, the elderly and the middle class, rather than those in the bottom half of the income distribution more generally, have been the largest beneficiaries.

“Given the massive changes in the pre-tax distribution of national income since 1980, there are clear limits to what redistributive policies can achieve,” they conclude.

—Laurent Belsie