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## Do Workers Work Harder during Economic Downturns?

During the Great Recession, the aggregate number of hours worked in the United States fell 10.01 percent, but output dropped only 7.16 percent. Thus, output per worker rose. This could be the result of changes in the mix of workers who are employed, with higher-productivity workers retaining their jobs during the downturn, or it could be because the same workers worked harder during this period. To distinguish between these two views, **Edward Lazear, Kathryn Shaw, and Christopher Stanton** study computer-tracked daily productivity data for more than 23,000 workers at a large technology services company between 2006 and 2010. In **Making Do with Less: Working Harder during Recessions** (NBER Working Paper No. 19328), they conclude that the productivity rise during the recent recession came mostly

because employees worked harder, not because employers kept good workers and got rid of laggards. They find that productivity at the

firm they analyze rose 5.4 percent during the recession, with at least 85 percent of that increase attributable to employees boosting their own productivity. They write that “each worker produced more output than would have been the case during normal times.”

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Some of the most compelling evidence that the nature of the labor market affected the productivity of workers comes from measuring differences at the firm’s far-flung facilities. With operations spread across many states, the company had workers doing exactly the same job in high-unem-

ployment states such as Florida, where the unemployment rate rose from 3.3 percent to 11.2 percent between June 2006 and May 2010, and in states that were less affected by the recession, such as Kansas, where the unemployment rate rose from 4.4 percent to 7.1 percent over the same period. The authors find that worker effort increased the most in the firm’s operations where unemployment rose the most.

The least productive workers before the recession were the ones who boosted their productivity the most as unemployment climbed. When the local unemployment rate rose 5 percent, workers whose initial productivity was below the firm median

boosted their productivity by 5.65 percent, while workers with above-median initial productivity exhibited a minimal change.

The changing composition of the workforce had minimal effects on productivity. The authors find

no differences in quality between workers who left the firm and those who stayed. They did find that those newly hired during the recession were 1.5 percent more productive than all the other workers, but their overall impact was

small because they made up only 30 percent of the workforce. The changing composition of the workforce accounted for only 0.68 percentage points of the overall 5.4 percent boost in productivity.

— Laurent Belsie

## Star Scientists Are Attracted by State Incentives for Innovation

States spend billions of dollars through tax credits and other subsidies designed to attract cutting-edge technology companies and to spur creation of innovation clusters. In **State Incentives for Innovation, Star Scientists and Jobs: Evidence from Biotech** (NBER Working Paper No. 19294), authors **Enrico Moretti** and **Daniel Wilson** find that state-provided incentives for biotechnology companies lead to significant increases in the number of private-sector “star scientists” and biotech workers employed in the state. They also find that these incentives have a multiplier effect that generates employment in other sectors such as construction and retail. The incentives, however, have only limited effects on salaries, total patents, and on the productivity of incumbent scientists already employed in states.

In 2010, 11 states provided some type of incentive aimed at biotech companies in the hope of attracting life science jobs and firms. Thirty-four states offered broad-based R&D tax credits, which tend to heavily benefit

research-intensive biotech firms. The average effective credit rate of the R&D incentives has grown

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rapidly in recent years, with some states’ rates becoming as generous as or even exceeding federal credit incentives.

To analyze the effects of such incentives, the authors track data on scientists’ relocations, employment, wages, companies, and patents — each specific to the biotech sector — for the period 1990–2010. They estimate that the adoption of subsidies for biotech employers by a state raises the number of “star biotech scientists” — defined as those whose biotech-related patent counts over ten years were in the top five percentiles of the U.S. scientist distribution — by about 15 percent over a three-year period. They also find that a 10 percent decline in the user cost of capital as a result of R&D tax incentives raises the number of star sci-

entists by 22 percent. The authors find that the increases were largely concentrated among private-sector

inventors and that there was little effect on academic researchers, whose financial incentives are structured differently within mostly non-profit institutions. The private-sector impact of various incentives went well beyond the number of top scientists, and affected total employment within the biotech sector.

The authors also note that the adoption of biotech incentives resulted in employment gains in other sectors, consistent with the notion of a strong local multiplier effect. For instance, they find that in states that adopted subsidies for biotech employers, the construction industry gained 37,000 jobs, a 16 percent increase over a pre-incentives baseline, while the retail industry added 31,000 jobs, a 6.7 percent jump. The real estate industry, which might be partic-

ularly sensitive to in-migration of new workers, saw 6,000 additional jobs, an 8.0 percent increase. States adopting tax credits for R&D generally did not experience significant employment gains in retail or real estate, but

they did experience an employment increase in construction of 6.7 percent.

The authors note that "...the finding that subsidies to biotech R&D raise biotech employment in a state does not tell us whether

those subsidies are economically justified." They emphasize that understanding the nature and magnitude of spillover effects in other industries may also be a critical input for such analysis.

—Jay Fitzgerald

## What Explains Recent Changes in SNAP Enrollment?

The Supplemental Nutrition Assistance Program (SNAP), formerly called Food Stamps, is one of the largest and most expensive programs in the United States' means-tested welfare system. In 2011, it provided benefits worth \$72 billion to 45.3 million people. It has grown rapidly in recent years, with some pointing to poor economic conditions, and others to program changes, as the source of the growing beneficiary rolls.

In **The Decline, Rebound, and Further Rise in SNAP Enrollment: Disentangling Business Cycle Fluctuations and Policy Changes** (NBER Working Paper No. 19363), **Peter Ganong** and **Jeffrey Liebman** conclude that recent SNAP enrollment increases were driven by the substantial increase in the number of people living close to the poverty line. Between 2007 and 2011, an additional 19.1 million people enrolled. Of those, an estimated 3.4 million (18 percent) became eligible as a result of more relaxed asset and time limits. The authors estimate that changes in local unemployment

explain at least two-thirds of the increase in SNAP enrollment during this period.

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The authors estimate that a persistent one percentage point increase in the local unemployment rate is associated with an increase in SNAP enrollment of 20 percent over three years. They note that unemployment is not the only source of economic distress that might lead an individual to become a SNAP beneficiary. Even those who remain employed may experience economic distress if their work hours are cut or widespread unemployment diminishes their informal economic support network. Using data from the Survey of Income and Program Participation (SIPP), the authors calculate that 31 percent of the aggregate increase in SNAP receipt occurred in families where "no member experienced an unemployment spell and at least one member was in the labor force."

The authors note that SNAP

rolls have not risen continuously in the last two decades. SNAP enrollment began declining in

1993, reaching its lowest point relative to the U.S. population in 2001. It fell at an increasing rate after the passage of national welfare reform legislation in 1996, declining "more in the demographic groups most affected by welfare reform, in states where cash assistance caseloads dropped the most, and for people receiving cash assistance at the time of the 1996 welfare reform legislation." Enrollment by families headed by a single mother fell by about 4.4 million during this period. Combining data from the SIPP and the random audits of about 50,000 cases done each year as part of the federal government's quality control system, the authors estimate that about half of that enrollment decline came about because mothers increased their employment and earnings enough to exceed income eligi-

bility limits. The other half of the decline in receipt is attributable to mothers who left cash assistance but had incomes that were low enough to maintain eligibility.

Between 2001 and 2007, the SNAP take-up rate rose from 54 percent to 69 percent. The authors

conclude that one-fourth to one-third of the increased take-up was the result of simplified enrollment and more relaxed asset tests that were implemented during this period in an attempt to increase program participation among the working poor. Because their

estimates suggest that states with larger declines in cash assistance receipt in the 1990s had larger increases in SNAP receipt in the following decade, they hypothesize that the rise in SNAP receipt may also reflect a “bounce back” from welfare reform.

—Linda Gorman

## How Did the Miller-Coors Merger Affect the U.S. Beer Industry?

**M**ergers can have many effects, and they may vary across industries and markets. In **Efficiencies Brewed: Pricing and Consolidation in the U.S. Beer Industry** (NBER Working Paper No. 19353), **Orley Ashenfelter, Daniel Hosken** and **Matthew Weinberg** analyze the 2008 merger between Miller and Coors, the second and third largest American breweries. They focus on whether the merger resulted in efficiencies, which could lead to lower prices, and whether the increased market power of the combined firm affected prices. They study the merger’s impact in 48 markets and conclude that efficiencies were indeed achieved, but that prices also went up.

Prior to the merger, Coors was brewed in two locations, while Miller was brewed in six locations more widely distributed across the United States. The merger was expected to allow the combined firm to reduce shipping costs primarily by moving the production of Coors products into Miller plants. The average distance

between a Coors brewery and the markets considered in this study decreased by 364 miles after the

merger. nationally, the local market variation makes it possible to study the distinct effects of the merger.

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“Despite reducing the number of macro brewers from three to two, the efficiency gains created by the merger offset the incentive to increase prices in the average regional market in the long run.”

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merger. Pre-merger analysis noted that this cost saving could give the combined firm an incentive to reduce the prices of its products, potentially offsetting any incentive to increase prices as a result of the reduction in the number of independent brewers.

The researchers exploit two key features of the U.S. beer industry in analyzing the effects of the merger. First, regulations on the distribution of beer effectively make different metropolitan areas separate markets. Second, there was substantial variation in how the merger was expected to reduce shipping costs and increase concentration across the 48 regional markets in the study. Thus, even though both Coors and Miller create products that are sold

The authors compare the change in the average price of beer in a market with the predicted increase in concentration resulting from the merger and the reduction in distance between that market and the nearest Coors brewery. They find that larger predicted increases in concentration were associated with larger price increases, and that larger reductions in shipping distances were associated with smaller price increases or price reductions. Further, they find that the market power effect developed more quickly than efficiency saving: prices began increasing gradually as soon as the merger was announced in markets where the merger increased market concentration. However, the researchers’

estimates indicate that cost reductions did not start to impact pricing until a year after the merger was approved by the U.S. Justice Department. These efficiency savings were not fully incorporated into prices until about two years after the merger's approval.

The authors find that despite reducing the number of macro brewers from three to two, the

efficiency gains created by the merger offset the incentive to increase prices in the average regional market in the long run. If the distribution costs had not been affected by the merger, the average market would have experienced a price increase of just under 2 percent because of the merger. If market power had not been affected, the efficiencies created

by the merger would have led to a long-run price decline of about 1.8 percent in the average market. The authors caution against over-generalizing from their findings, but maintain that the Miller-Coors merger can be viewed as generating 48 small experiments that differentially varied expected increases in both concentration and reductions in costs.

— Matt Nesvisky

## How Do Students Respond to Performance-Based Scholarships?

Many policies designed to raise student achievement in the United States focus on raising the effort that students devote to their studies, for example by offering rewards for achieving prescribed benchmarks. These strategies are based on the belief that because the payoffs to education may be too far in the future to motivate some students, financial incentives that make the payoffs more immediate may be warranted. In **Financial Incentives and Educational Investment: The Impact of Performance-Based Scholarships on Student Time Use**, (NBER Working Paper No. 19351), authors **Lisa Barrow** and **Cecilia Rouse** test whether and how financial incentives change student behavior using survey data from a field experiment in California and New York. Overall the results indicate that well-designed incentives can induce post-secondary students to increase investments in educational attainment.

In the experiment, students were randomly assigned to treatment and control groups where the treatments were incentive

to other activities such as work and leisure. The incentives did not decrease students' inherent interest in or enjoyment of learn-

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payments which varied in length and magnitude and were tied to meeting performance, enrollment, and/or attendance benchmarks. Students were then asked to fill out a survey including questions about time allocated to different activities as well as questions aimed at measuring the quality of educational efforts, such as learning strategies, academic self-efficacy, and motivation.

The results suggest that providing post-secondary scholarships with incentives to meet specific benchmarks induced students to devote more time to educational activities and to increase the quality of the effort directed toward their studies. Students also allocated less time

ing, or increase cheating to raise their grades. The results also suggest that students who appeared to discount the future the most, such as those who dropped out of high school before the twelfth grade, were the most responsive to the incentives. Further, the incentives only generated impact during semesters of eligibility.

A puzzle is that larger incentive payments did not seem to induce students to increase effort more than smaller incentive payments. The authors speculate that this might be because students just need a small prompt to encourage them to put more effort into their studies.

— Claire Brunel

## CEO Investment Cycles

The chief executive officer (CEO) and the top management team are widely viewed as critical to a company's success or failure, yet it is often difficult to identify specific actions by corporate leaders that affect firm fortunes. One way to address this question is to study how a firm's activities vary over the CEO's term in office. A CEO's incentives and power inside the firm are likely to vary over the course of his or her tenure, and this may lead to systematic differences in firm behavior. In **CEO Investment Cycles** (NBER Working Paper No. 19330), authors **Yihui Pan, Tracy Yue Wang, and Michael Weisbach** document patterns in corporate investment and disinvestment activities over the "CEO cycle" in a large sample of publicly traded U.S. firms.

The authors find that disinvestments are fairly common in the early years of a CEO's tenure, and that these disinvestments decrease with tenure. Investments, on the

other hand, are relatively low in the early years of a CEO's tenure and increase over time. As a result, the firm's assets and employment

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"Assets and employment grow more slowly early in the CEO's tenure than in later years."

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grow more slowly early in the CEO's tenure than in later years. These cyclical changes in investment are observed using a variety of distinct measures of investment and disinvestment, and regardless of the reason for the CEO turnover, the CEO's background, or the industry conditions at the time of the turnover.

The authors find that the annual investment rate, measured as the investment-to-capital-stock ratio, is about 6 percentage points lower, and the asset growth rate is about 3 percentage points lower, in the first three years of a CEO's tenure than in later years. The median investment rate in their sample is 24 percent and the

median asset growth rate is 7.6 percent. The magnitude of the "CEO cycle effect" is substantial, and is comparable to that of other

factors that are known to influence investment, such as the business cycle, political uncertainty, and financial constraints.

The authors suggest that early in the CEO's tenure, the CEO disinvests poorly performing assets that his predecessor was unwilling to abandon. Subsequently, when the CEO gains more control of the corporate board, he may over-invest. Empirically, both the increase in the quantity and the decrease in the quality of investment appear to be a function of the CEO's growing control over the board during his tenure. There is no evidence that the investment cycles occur because of shifting CEO skill or productivity shocks.

— Les Picker

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