

May 2015

INSIDE THIS ISSUE

- NIH Funding Spurs Private Patenting
- Employment Cyclicity and Firm Quality, 1998–2011
- Residential Segregation in the U.S. Rose Dramatically, 1880–1940
- Rising Macroeconomic Volatility is Associated with Increases in Foreign Assets
- Momentum Trading, Return Chasing, and Predictable Crashes

Childhood Medicaid Coverage Improves Adult Earning and Health

Medicaid today covers more Americans than any other public health insurance program. Introduced in 1965, its coverage was expanded substantially, particularly to low-income children, during the 1980s and the early 1990s.

Throughout Medicaid's history, there has been debate over whether the program improves health outcomes. Two new NBER studies exploit variation in children's eligibility for Medicaid, across birth cohorts and across states with different Medicaid programs, along with rich longitudinal data on health care utilization and earnings, to estimate the long-run effects of Medicaid eligibility on health, earnings, and transfer program participation.

In **Childhood Medicaid Coverage and Later Life Health Care Utilization** (NBER Working Paper No. 20929), [Laura R. Wherry](#), [Sarah Miller](#), [Robert Kaestner](#), and [Bruce D. Meyer](#) find that among individuals who grew up in low-income families, rates of hospitalizations and emergency department visits in adulthood are negatively related to the number of years of Medicaid

eligibility in childhood. The authors exploit the fact that one of the substantial expansions of Medicaid eligibility applied only

Two studies use variation in Medicaid eligibility across birth cohorts and states to estimate the program's long-run effects on participants.

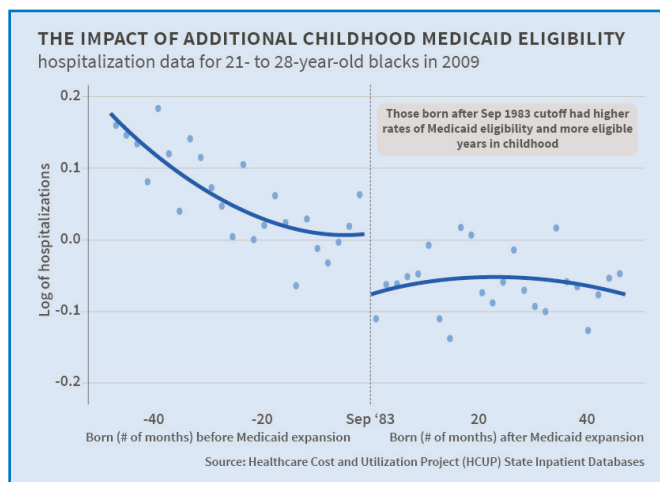
to children who were born after September 30, 1983. This resulted in a large discontinuity in the lifetime years of Medicaid eligibility for children born before and after

with the gain occurring between the ages of 8 and 14. The authors compare children who they estimate were in low-income

families, and otherwise similar circumstances, who were born just before or just after this date, to determine how the number of years of childhood Medicaid eligibil-

ity is related to health in early adulthood. Their finding of reduced health care utilization among adults who had more years of childhood Medicaid eligibility is concentrated among African Americans, those with chronic illness conditions, and those living in low-income zip codes. The authors calculate that reduced health care utilization during one year in adulthood offsets between 3 and 5 percent of the costs of extending Medicaid coverage to a child.

In **Medicaid as an Investment in Children: What is the Long-Term Impact on Tax Receipts?** (NBER Working Paper No. 20835), [David W. Brown](#), [Amanda E. Kowalski](#), and



this birthdate cutoff. Children in families with incomes between 75 and 100 percent of the poverty line experienced about 4.5 more years of Medicaid eligibility if they were born just after the September 1983 cutoff than if they were born just before,

Ithai Z. Lurie conclude that each additional year of childhood Medicaid eligibility increases cumulative federal tax payments by age 28 by \$247 for women, and \$127 for men. Their empirical strategy for evaluating the impact of Medicaid relies on variation in program eligibility during childhood that is associated with both birth cohort and state of residence. The authors study longitudinal data on actual tax payments until individuals are in their late 20s, and they extrapolate this information to make projections for these individuals at older ages. When they compare the incremental dis-

counted value of lifetime tax payments with the cost of additional Medicaid coverage, they conclude that “the government will recoup 56 cents of each dollar spent on childhood Medicaid by the time these children reach age 60.” This calculation is based on federal tax receipts alone, and does not consider state tax receipts or potential reductions in the use of transfer payments in adulthood.

Both studies use large databases of administrative records to analyze the long-term effects of Medicaid. The first study measures health utilization using the Healthcare Cost and Utilization Project

(HCUP) State Inpatient Databases for Arizona, Iowa, New York, Oregon, and Wisconsin in 1999, and those states plus Maryland and New Jersey in 2009. State hospital discharge data were also available from Texas and California. Data on all outpatient emergency department visits were available for six states in 2009. The second study examines data on federal tax payments and constructs longitudinal earnings histories for individuals who were born between 1981 and 1984. It also analyzes administrative records on Medicaid eligibility of children in this cohort.

—Linda Gorman

NIH Funding Spurs Private Patenting

The National Institutes of Health (NIH) is the largest funder of biomedical research in the United States. A perennial question about the NIH, and other government bodies that fund research, is what are the societal and medical benefits of all this government-funded research? **Pierre Azoulay, Joshua S. Graff Zivin, Danielle Li, and Bhaven N. Sampat** provide new evidence on the links between such research funding and innovation.

In **Public R&D Investments and Private-Sector Patenting: Evidence from NIH Funding Rules** (NBER Working Paper No. 20889), the authors find that NIH funding of biomedical research leads to increased biomedical patenting by firms without crowding out private investment in other research areas.

One of the challenges to evaluating the productivity of government-supported research is establishing direct

links between specific research projects and specific results, such as cure of a disease or development of a new blockbuster drug or medical device. As other

build on the prior research of others, creating a complicated genealogy of projects which may have contributed to successful outcomes.

An additional \$10 million in NIH funding generates 3.1 additional private-sector patents in the research area that receives the funding.

researchers and the authors have noted, scientific research usually doesn’t follow a straight path from laboratory to a publicly acknowledged success. Research

In their study, the authors examined NIH funding of biomedical research projects from 1980 through 2005 and sought to quantify the impact of that

funding on the rate of patent production by pharmaceutical and biotechnology firms. They created an entirely new “bibliometric” database which allowed them to link NIH grants that had been cited in publications to patent applica-

into one disease may have a beneficial effect on treatment of a completely different disease years after the original research project is completed. Public-sector and private-sector scientists often

tions that specifically cited those publications. This approach allowed the authors to track the often-circuitous path from NIH funding to subsequent patentable innovations. Using publication citations

Patent type	% citing	
	NIH funded research	research similar to NIH funded research
Advanced drug candidates	49.9	88.2
FDA approved drugs	42.5	86.8

Sources: PubMed, U.S. Patent and Trademark Office, FDA’s “Orange Book” and IMS Health

and NIH project data, they also could measure whether NIH funding crowded out private research efforts.

The authors find that NIH funding increases total private-sector patent activity. One of their central estimates suggests that an additional \$10 million in NIH funding generates 3.1 additional private-sector patents in the same research area, or approximately one patent for every two NIH grants.

With regard to patents associated with U.S. Food and Drug Administration-approved biopharmaceutical products, one set of the authors' calculations suggests that

\$1 of NIH funding leads to between 70 cents and \$2.13 in lifetime pharmaceutical sales. These estimates based on drug sales do not take into account other potentially important benefits from NIH investment, including the consumer benefits from these drugs, the development of other patented technologies such as medical devices, and the development of other non-patented technologies such as new clinical protocols.

There are apparently substantial "spillover effects" from one research project to the next. The researchers find that about half of the patents resulting from NIH funding are for application to a disease different from the

one targeted in the initial research.

"The size of this effect underscores the importance of our approach to linking patents with funding," the authors write. "By looking only within the same disease area when measuring impact, the prior literature in this area may miss almost half of the total impact of basic science funding."

The study does not find any decrease in patenting activity by private companies in research areas not covered by NIH grants. "This suggests that NIH funding spurs private patenting by increasing total firm R&D expenditure," the authors write.

—Jay Fitzgerald

Employment Cyclicity and Firm Quality, 1998–2011

Lisa B. Kahn and Erika McEntarfer analyze the effects of the business cycle on employment at high- and low-paying firms. They find that low-paying firms are less cyclically sensitive, and as a result fare better in terms of employee retention and employment growth during economic downturns.

In NBER Working Paper No. 20698, **Employment Cyclicity and Firm Quality**, the authors use data from the Longitudinal Employer Household Dynamics program, a U.S. employer-employee matched database, for the period 1998 to 2011. They find that employment growth at low-paying firms varied less with the state unemployment rate than employment growth at higher-paying firms. This implies that the quality of jobs erodes in a downturn, as higher-paying firms shed a larger fraction of their workers than lower-paying firms.

Kahn and McEntarfer provide evidence that the cyclical pattern in growth

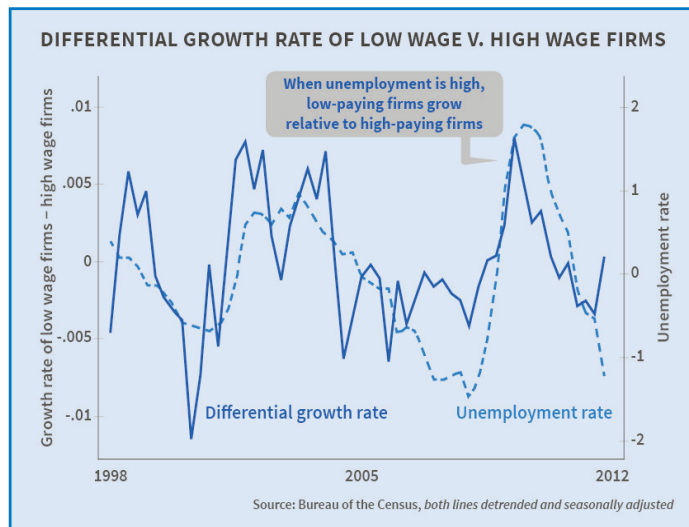
Employment growth at low-paying firms is less sensitive to the business cycle than employment growth at higher-paying firms.

rates is likely driven by a partial collapse of movement up the job ladder in economic downturns. This suggests that low-paying

ties get stuck in place. The authors find that advancement on the job ladder is 20

percent slower for those working at the lowest-paying firms in a major bust, compared with a boom. They also estimate that the distribution of new job matches shifts towards these lower-paying firms in a downturn. The combination of a poor initial match and a reduced likelihood of upgrading implies that new job matchers are particularly hurt by recessions.

In normal times, low-paying firms experience a high rate of worker separation, and therefore also do a lot of replacement hiring. In bad times, separations decline substantially at these firms, which reduce hires proportionately. This keeps the growth rate relatively constant over the



firms fare relatively better in a downturn because workers at these firms who are hoping to move on to better opportuni-

business cycle. The decline in separations exhibited in a recession apparently is a decline in voluntary separations by workers, since the largest effect is for separations to employment—workers leaving one firm for a job at another. For higher-paying firms, the impact on separations to employment is small, but they experience an increase in separations to non-employment, probably layoffs, and they significantly reduce hiring.

Kahn and McEntarfer’s data indicate that the reduced ability to move on to better matches caused by a recession has a greater impact on workers in low-quality firms compared with those in high-quality firms. Their results show that workers finding new jobs in recessions are more likely to go to low-paying firms, and more likely to stay there once hired, than workers hired during better economic times.

The researchers conclude that these effects yield an estimated 2.6 percent reduction in average firm quality a year after matching for those who find a job in a recession compared with a boom. This corresponds to \$75 per month lower average firm pay, and translates into roughly half of the advancement made by workers finding a job during a boom.

—Matt Nesvisky

Residential Segregation in the U.S. Rose Dramatically, 1880–1940

In **The National Rise in Residential Segregation** (NBER Working Paper No. 20934), **Trevon Logan** and **John Parman** introduce a first-of-its-kind measure of residential segregation based upon the racial similarity of next-door neighbors. Using the complete manuscript pages of the federal census to identify the races of next-door neighbors for the period 1880–1940, the authors were able to analyze segregation consistently and comprehensively for all areas in the United States, allowing for an in-depth view of the variation in segregation across time and space.

The authors find that residential segregation in the United States doubled from 1880 to 1940. The findings show that the likelihood of having opposite-race neighbors declined precipitously in every region of the United States.

The rise in segregation occurred in areas with small black population shares, areas with large black population shares, areas that experienced net inflows of black residents, areas that experienced net outflows of black residents, urban areas with large

populations, and rural areas with smaller populations. In light of these findings, the

abutting white communities, the use of restrictive covenants on residential housing,

The likelihood of having opposite-race neighbors declined precipitously in every region of the United States.

authors conclude that the traditional story of increasing segregation in urban areas in response to black migration to urban centers is incomplete, and must be augmented

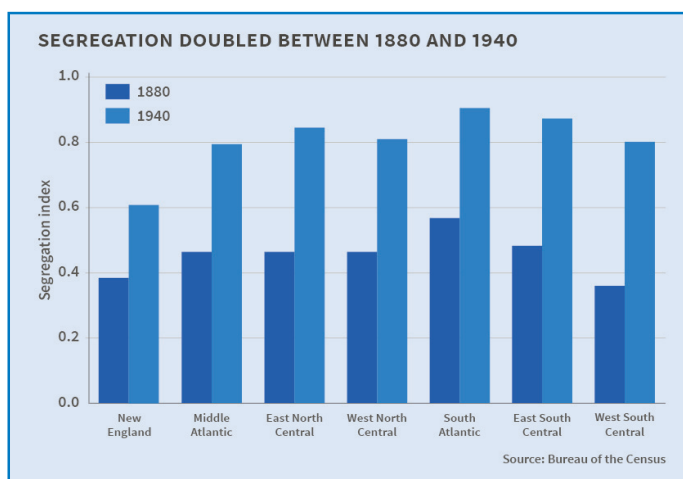
the presence of large manufacturing firms which employed blacks, and differences in transportation infrastructure, since these were all urban phenomena. The increase in rural segregation also complicates historical narratives that view population dynamics in rural areas as stagnant. The focus on urban segregation has neglected the fact that rural areas became increasingly segregated over time.

Logan and Parman suggest that because the rise in segregation over the first half of the 20th century was a truly national phenomenon, it opens new lines of inquiry. Understanding the

relationship between segregation, urbanization, and population flows should help to explain the dynamics of segregation in cities and rural communities in the 20th century. These links have important implications for the skill mix of cities, public finance, educa-

with a discussion of the increasing racial segregation of rural areas and other areas that lost black residents.

The findings complicate traditional explanations for increasing segregation as being due to blacks clustering in small areas



tion, inequality, health, and other measures of social wellbeing. The strong persistence of segregation that the authors find suggests that the roots of contemporary segregation may be more varied than previously thought. This gives rise to a range of questions about the impact of Jim Crow laws, racial violence,

European immigration, internal migration, and the differences and similarities between racial segregation in rural and urban areas in the United States.

While this paper examines segregation patterns from the post-Civil War era to 1940, the authors' methodology

could be applied to developing a better understanding of the modern impacts of segregation on a range of socioeconomic outcomes, the authors say, particularly segregation's effect on contemporary racial disparities.

—Les Picker

Rising Macroeconomic Volatility Is Associated with Increases in Foreign Assets

The more volatile a nation's economy relative to its partners, the more resources its residents choose to hold in foreign assets, according to research reported in **Macroeconomic Volatility and External Imbalances** (NBER Working Paper No. 20872). A 50 basis point (one-half of one percentage point) rise in the volatility of GDP over 10 years is positively associated with an increase in net foreign assets equal to around 8 percent of GDP, write authors **Alessandra Fogli** and **Fabrizio Perri**. They develop an open-economy model to explain this dynamic, in which countries face shocks to their macroeconomic volatility.

"The key mechanism is precautionary motive: more uncertainty induces residents to save more, and higher savings are in part channeled into foreign assets," they write. "We conclude that both data and theory suggest uncertainty/volatility is an important determinant of the medium/long run evolution of external imbalances in developed countries."

This study suggests both empirically and theoretically that macroeconomic volatility is a major factor in explaining how some nations develop external imbalances and others don't.

The authors' empirical results were drawn from an analysis of all the OECD countries with comparable macroeconomic

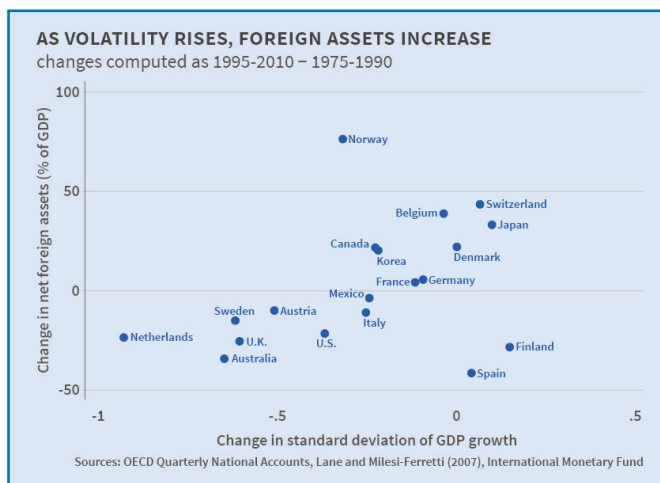
Japan, by contrast, saw its relative volatility rise about 100 basis points. Its net foreign assets increased by 50 percent of GDP.

The estimated relation between volatility and imbalances is statistically significant and economically important.

data beginning no later than the early 1980s. The estimated relation between volatility and imbalances is statistically significant and economically important.

From 1980 to 2010, for example, volatility in the United States—mea-

Many forces can lie behind these changes. In order to assess the effect of volatility separately from other factors, the study controls for many influences on a country's net foreign asset position, including country characteristics such as the quality of its institutions, factors affecting all countries such as financial globalization or the rise of new industrial powers such as China and India, changes in the country's growth rate, inflation, trade and financial openness, and finally demographic structure. Even after controlling for all these factors, the authors find that changes in relative volatility can explain between a fourth and a third of the observed changes in the net foreign assets



sured as the standard deviation of quarterly real GDP growth minus the average of the other countries' standard deviation of quarterly real GDP growth over the interval—declined some 40 basis points. During that period, the net foreign assets of the U.S. fell by nearly 25 percent of GDP.

across OECD nations. A simple open-economy model in which countries suffer shocks to their productivity, and in which the degree of volatility of the shocks can vary, can quantitatively account for the observed cross-section of external imbalances and

for the observed relation between volatility and imbalances.

“Macro uncertainty, as well as fea-

tures shaping the precautionary motive, should be a major factor to consider when discussing the causes, the sustainability

and desirability of observed global imbalances,” the authors conclude.

— Laurent Belsie

Momentum Trading, Return Chasing, and Predictable Crashes

Trading strategies that mechanically construct portfolios using the momentum strategy—which consists of buying recent winners and selling recent losers—have recently attracted growing attention.

In **Momentum Trading, Return Chasing, and Predictable Crashes**, (NBER Working Paper No. 20660), authors **Benjamin Chabot**, **Eric Ghysels**, and **Ravi Jagannathan** provide new evidence on the risks and returns of momentum investing using historical data from Victorian Era London and the mid-1920s to the present-day United States.

During both periods, the momentum strategy generated positive, abnormal returns but exposed investors to occasional sharp losses or “crashes.” The excess return associated with momentum trading averaged roughly 1 percent per month between 1927 and 2012, and 0.5 percent per month between 1867 and 1907. During both periods, however, momentum investors suffered periodic crashes. The authors

find these momentum crashes were pre-

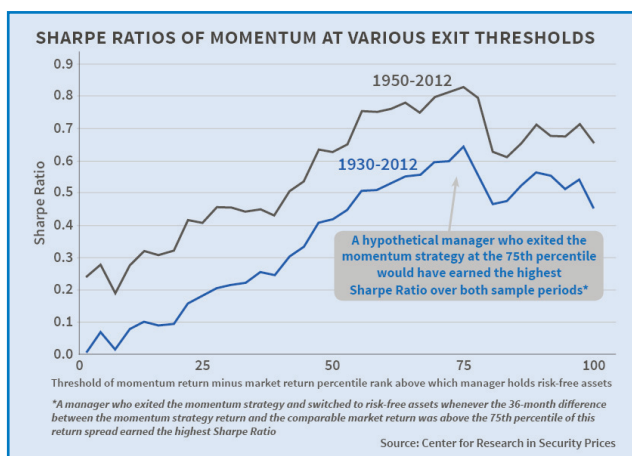
Even when the risk of a momentum ‘crash’ is high, managers still have incentives to commit other people’s money to the momentum strategy.

dictable. Investment managers could have increased the Sharpe Ratios of their port-

the incentives to take actions to avoid crashes.

The authors conjecture that those who possess the necessary trading skills to efficiently execute the momentum strategy typically manage other people’s money. The authors use a theoretical model to analyze the incentives of money managers who collect a fee for investing third-party funds and compete for the funds of return chasing investors. They find that even at times when the likelihood of a momentum crash is high enough that managers would not commit their own funds to the momentum strategy, the competition for the funds of return-chasing investors and the incentives in compensation contracts combine to entice managers to keep other peoples’ money invested in momentum.

— Claire Brunel



folios by reducing exposure to momentum when it was more likely to crash. The fact that fund managers employing algorithmic momentum strategies suffer occasional dramatic losses suggests these managers either cannot anticipate momentum crashes or lack

NBER

The National Bureau of Economic Research is a private nonprofit research organization founded in 1920 and devoted to objective quantitative analysis of the American economy. Its officers are:

James M. Poterba—President & Chief Executive Officer
Martin B. Zimmerman—Chairman
Karen N. Horn—Vice Chairman

The **NBER Digest** summarizes selected Working Papers recently produced as part of the Bureau’s program of research. Working Papers are intended to make preliminary research results available to economists in the hope of encouraging discussion and suggestions for revision. The **Digest** is issued for similar informational purposes and to stimulate discussion of Working Papers before their final publication. Neither the Working Papers nor the **Digest** has been reviewed by the Board of Directors of the NBER.

The **Digest** is not copyrighted and may be reproduced freely with appropriate attribution of source. Please provide the NBER’s Public Information Department with copies of anything reproduced.

Individual copies of the NBER Working Papers summarized here (and others) are available free of charge to Corporate Associates and to the affiliates of other organizations, such as universities and colleges, with subscriptions. For all others, there is a charge of \$5.00 per downloaded paper or \$10.00 per hard copy paper. Outside of the United States, add \$10.00 per order for postage and handling. Advance payment is required on all orders. To order, call the Publications Department at (617) 868-3900 or visit www.nber.org/papers. Please have the Working Paper Number(s) ready.

Subscriptions to the full NBER Working Paper series include all 1000 or more papers issued each year. Subscriptions

are free to Corporate Associates. For others within the United States, the standard rate for a full subscription is \$9000; for academic libraries and faculty members, \$7200. Higher rates apply for foreign orders. The on-line standard rate for a full subscription is \$2160 and the on-line academic rate is \$1000.

Partial Working Paper subscriptions, delineated by program, are also available. For further information, see our Web site, or please write: National Bureau of Economic Research, 1050 Massachusetts Avenue, Cambridge, MA 02138-5398.

Requests for **Digest** subscriptions, changes of address, and cancellations should be sent to **Digest**, NBER, 1050 Massachusetts Avenue, Cambridge, MA 02138-5398 (please include the current mailing label), or by sending email to subs@nber.org. Print copies of the **Digest** are only mailed to subscribers in the U.S. and Canada; those in other nations may request electronic subscriptions at www.nber.org/dsunsubscribe/.