

David H. Romer and Justin Wolfers, Editors

# *Brookings Papers*

ON ECONOMIC ACTIVITY

FALL 2010

**PARKER and VISSING-JORGENSEN**

on the Cyclicalities of High Incomes and the  
Rise in Income Inequality

**BITLER and HOYNES**

on the Social Safety Net in the Great Recession

**DEE and JACOB**

on the Impact of No Child Left Behind

**EDGE and GÜRKAYNAK**

on the Forecasting Performance of DSGE Models

**GORTON and METRICK**

on Regulating the Shadow Banking System

**HINES**

on State and Local Budgets and the Business Cycle

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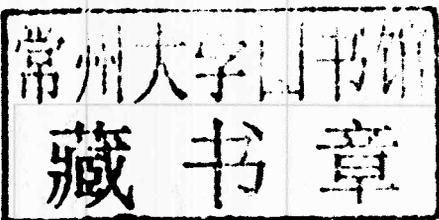
ON ECONOMIC ACTIVITY

FALL 2010

DAVID H. ROMER

JUSTIN WOLFERS

*Editors*



BROOKINGS INSTITUTION PRESS  
Washington, D.C.

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**THE BROOKINGS INSTITUTION**

*1775 Massachusetts Avenue, N.W., Washington, D.C. 20036*

*ISSN 0007-2303*

*ISBN-13: 978-0-8157-2157-4*

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**PURPOSE**

The *Brookings Papers on Economic Activity* publishes research in macroeconomics, broadly defined, with an emphasis on analysis that is empirical, focuses on real-world events and institutions, and is relevant to economic policy. Papers are presented and discussed at conferences twice each year, and the papers and discussant remarks are published in the journal several months later. The intended audience includes analysts from universities, research institutions, governments, and business. The subject matter encompasses all fields of economic inquiry relevant to macroeconomics, including business cycles; development and long-term growth; the distribution of income, wealth, and opportunities; financial markets; international capital and foreign exchange markets; fiscal and monetary policy; international trade; labor markets; the public sector and the welfare state; energy; the environment; political economy; regulation and industrial organization; education; health; and demography.

The conference and the journal are based upon the work partially supported by the National Science Foundation under Grant No. 0752779 and the Alfred P. Sloan Foundation. The papers and discussant remarks reflect the views of the authors and not necessarily the views of the funding organizations or the staff members, officers, or trustees of the Brookings Institution.

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Although most papers that appear in the *Brookings Papers* are solicited by the editors, the editors welcome submitted proposals. Editorial decisions are generally made about nine months in advance of each conference. Therefore, proposals should be received by December 1 for the following fall conference and by June 1 for the following spring conference. Proposals should be no more than five double-spaced pages and should be sent to [brookingspapers@brookings.edu](mailto:brookingspapers@brookings.edu).

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## *Editors' Summary*

**THE BROOKINGS PANEL ON ECONOMIC ACTIVITY** held its ninetieth conference in Washington, D.C., on September 16 and 17, 2010, just as the economy was struggling to recover from the Great Recession. The *Brookings Papers* has always strived to provide timely policy analysis, and five of the papers in this volume study aspects of the causes and consequences of this slump. These papers examine the effects of the business cycle on the incomes of the very richest Americans; welfare, welfare reform, and poverty during recessions; the failure of modern macroeconomic models to adequately forecast economic conditions; the role of shadow banking in the financial crisis and the appropriate regulatory response; and expenditures by state and local governments over the business cycle. The remaining paper studies the impact of the No Child Left Behind Act, a far-reaching education reform that will shape the skills of the labor force for years to come.

IN THE FIRST PAPER, Jonathan A. Parker and Annette Vissing-Jorgensen study the cyclicity of income at the very top of the income distribution. The conventional wisdom has been that the brunt of recessions falls on less educated, lower-income workers. Parker and Vissing-Jorgensen show, however, that households in the top 1 percent of the income distribution see their income rise steeply in booms and fall sharply in busts, much more so than the average household. This pattern is robust: it appears regardless of the occupation of the high-earning households and is not driven by the timing of exercising stock options. It is not even confined to the United States: the authors present evidence of similar patterns in Canada. Importantly, they find that consumption as well as income moves with the business cycle among those at the top.

These results do not mean that the conventional wisdom was entirely wrong, however. It remains true that less educated households also suffer disproportionately during recessions, largely because of increased unemployment. The impact of recessions on income is therefore U-shaped across the income distribution: many low-income households are adversely affected, the middle of the distribution is less affected, and the very top of the distribution is hit hard.

Parker and Vissing-Jorgensen's new results are driven in part by their examination of post-1982 data. In earlier years, when top incomes were not so extraordinarily high, they were also less cyclical. Thus, an increase in the cyclicity of high earners corresponded with an increase in their relative incomes. Parker and Vissing-Jorgensen show that this pattern holds across different income groups, across decades, and even across countries: the more unequal the income distribution, the more cyclical is the income of the rich. The authors conclude by developing a theoretical model linking income cyclicity with income inequality. The model suggests that one source of their findings may be progress in information and communications technology, which has enabled very high ability entrepreneurs to leverage their talents, earning them more in good times but exposing them to plummeting demand in bad times.

IN THE SECOND PAPER, Marianne P. Bitler and Hilary W. Hoynes take the opposite perspective from Parker and Vissing-Jorgensen, exploring the cyclicity of well-being among the poorest. The United States has historically protected its poorest citizens from economic fluctuations through a patchwork system of welfare and social insurance programs: Aid to Families with Dependent Children provided cash assistance to poor families with children, while the food stamp program and Medicaid, among others, provided in-kind benefits. Welfare reform in the 1990s overhauled the cash assistance system (now called Temporary Assistance for Needy Families), and researchers have found that participation in this and some other welfare programs has declined since the reform. An unexplored—but currently pressing—question is whether welfare reform has weakened the social safety net, so that it no longer insures poor Americans against large income swings.

Bitler and Hoynes marshal an impressive array of evidence to attack this question, analyzing decades of data and studying numerous indicators of adult and child well-being. They find some evidence that welfare reform has weakened the safety net: poverty (using the official measure, which excludes noncash transfers) has risen more sharply with the unemployment

rate in the years after reform than it did in the years before. On the other hand, the authors also find that welfare reform has had no impact on the cyclicity of food consumption, food insecurity, health insurance coverage, household crowding, or health. Reconciling these results, Bitler and Hoynes report that participation in noncash safety net programs generally, and especially the food stamp program, has become much more responsive to economic conditions in the years since welfare reform. On the other hand, participation in cash assistance programs has, if anything, become less responsive to the business cycle. Overall, therefore, Bitler and Hoynes find that cash welfare reform weakened the safety net, but that the food stamp program picked up much of the slack.

IN THE THIRD PAPER, Thomas S. Dee and Brian A. Jacob evaluate the signature education legislation of the last several decades, the No Child Left Behind Act of 2001. This policy brought dramatic changes to the education landscape by instituting regular, high-stakes assessments of students in public schools. Proponents of No Child Left Behind hoped that these high-stakes tests would motivate school districts to improve educational outcomes, thereby aligning the interests of schools and teachers with those of voters and parents. Critics, however, worried that high-stakes testing would distort teacher incentives even further, encouraging them to teach to the test, ignore nontested subject matter, inappropriately place low-achieving students in special needs classrooms, and neglect high-achieving students.

In their thorough evaluation, Dee and Jacob find support for both the proponents and the critics. The authors focus on tests that are not part of the high-stakes tests under No Child Left Behind, and thus are unlikely to be substantially distorted by teaching to the test. They find that No Child Left Behind appears to have had a positive impact on math learning, especially at lower grades and for students from traditionally disadvantaged populations. They find no evidence of an adverse impact on math achievement at either the top or the bottom of the ability distribution; indeed, the evidence suggests that No Child Left Behind had a roughly constant impact across the ability distribution. On the other hand, the policy appears not to have improved reading performance.

Several mechanisms contributed to the improvement in math learning. No Child Left Behind induced schools to spend about \$600 more per student per year, Dee and Jacob estimate, with much of the extra money coming from state and local rather than federal sources. This money supported additional instruction as well as education support services. The legislation also led to an increase in the share of teachers with master's degrees.

But some of the critics' fears were justified: schools reduced instruction in social studies and science—nontested subjects—and increased instruction in tested subjects, especially reading.

IN THE FOURTH PAPER, Rochelle M. Edge and Refet S. Gürkaynak study the forecasting performance of the dynamic stochastic general equilibrium (DSGE) models currently fashionable among macroeconomists. DSGE models' emphasis on deep structural parameters, such as individuals' preferences, the available technology, and resource constraints, means that—if the models' underlying assumptions about economic behavior are correct—they are immune to the Lucas critique (that is, the possibility that forward-looking behavior can cause previous patterns to break down in response to policy changes or other developments). Yet their success in predicting macroeconomic movements remains largely unexplored.

The authors focus on the forecasts of the most prominent of these DSGE models for the United States over the period 1992–2006. Consistent with previous evaluations, they find that DSGE models yield forecasts that tend to be less biased and more accurate than the professional forecasts, the Federal Reserve's "Greenbook" forecasts, or purely statistical forecasts. But this is a limited success, as Edge and Gürkaynak find that the DSGE forecasts do *relatively* well only because the performance of all of these forecasts is quite poor. Indeed, the absolute performance of even the DSGE forecasts suggests that, for example, the 95 percent confidence interval around that model's forecasts of annual inflation is 4 percentage points wide, and that most of the time its forecast of annual GDP growth cannot rule out anything from a near-recession to a boom. The slight edge that DSGE forecasts have over other forecasts is therefore not particularly noteworthy, since it involves comparing one weak forecast with others.

The authors argue that the poor performance of all forecasting techniques reflects the time period they study. Because they focus on the Great Moderation period, there is little variation in inflation or GDP growth, and therefore little to forecast. A final thought experiment drives this point home. They ask whether a policymaker considering the 1992–2006 period would have done better adopting any of the forecasts they consider, or, assuming that the policymaker knew the actual mean for that period, using that mean as the forecast. It turns out that the simple average predicts better than any of the forecasts, confirming that none of the forecasts is providing much information.

A more telling evaluation of DSGE models' usefulness must therefore await assessments of their performance in less stable environments. As a step in this direction, Edge and Gürkaynak take a preliminary look at the Great Recession. They present suggestive evidence that the DSGE forecasts were remarkably slow to provide any information concerning the fall in output as the recession unfolded, and that they were outperformed by the other available forecasts in this episode.

IN THE FIFTH PAPER, Gary Gorton and Andrew Metrick examine the "shadow" banking system and consider how it should be regulated. The shadow banking system refers to arrangements or institutions that are economically similar to traditional banking but that operate outside traditional banking arrangements—and, crucially, outside traditional regulation.

Gorton and Metrick begin by documenting the magnitude and sources of the rise in shadow banking and its role in the financial crisis. They describe how a combination of regulatory restrictions on traditional banks, implicit government subsidies of shadow banking (notably through free implicit insurance of money market mutual funds), and financial innovation led to an explosion of shadow banking over the past three decades. They emphasize that one key force behind the growth of shadow banking is special bankruptcy provisions for repurchase agreements ("repos"), which give financial institutions access to a highly liquid source of short-term funding. They also describe how the conjunction of short-term liquid liabilities and long-term illiquid assets left shadow banking vulnerable to panics similar to traditional bank runs, and how such panics were critical in the financial crisis that erupted in the fall of 2008.

The authors then offer both some general principles for regulating shadow banking and a specific proposal to implement those principles. They point out that the critical role of the special bankruptcy provisions for repos gives regulators a powerful lever: by restricting the circumstances under which the bankruptcy safe harbor applies, regulators can shape the system. They argue that much of shadow banking involves sensible arrangements for handling large financial transactions, and thus that regulators should not try to use their powers to force a return to the traditional system. Instead, drawing on lessons from history, they argue that regulation should involve explicit insurance of money market mutual funds that guarantee stable asset values, and stronger collateral requirements for repos and securitization. The specific set of proposals they put forth involve creating new classes of narrow financial institutions for money market mutual funds and for the holding of securitized assets.

IN THE FINAL PAPER, James R. Hines, Jr. studies expenditure by state and local government over the business cycle. As Hines observes, more than 40 percent of total government expenditure comes from state and local rather than federal government. Since fiscal policy is a key tool for managing aggregate demand, how states and local governments respond to recessions is a key component of the fiscal policy response to the business cycle.

Whereas federal expenditure is clearly countercyclical, rising during recessions and falling (relative to GDP) during booms, Hines shows that aggregate state and local government expenditure hardly responds when GDP falls below its potential. Unlike the federal government, most states have balanced budget requirements that limit their ability to borrow during recessions. Countercyclical state fiscal policy therefore requires strong discipline; states need to save during the good times so they can spend in the bad.

Hines suggests, however, that poor governance in some states contributes to making their expenditure actually procyclical. States that rank higher in corruption, a proxy for more general incompetence, tend to have especially procyclical expenditure. Corroborating this story, Hines finds further evidence that states in general lack strong discipline in the fact that they have a high propensity (perhaps 80 percent) to spend out of federal grants. Whereas a rational state government would save the federal money, states apparently cannot help but spend the cash they have on hand. But this policy vice suggests a policy remedy: federal grants to state governments may be an effective way to stimulate aggregate demand during recessions.

# Brookings Papers

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FALL 2010

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## *The Increase in Income Cyclicity of High-Income Households and Its Relation to the Rise in Top Income Shares*

**ABSTRACT** We document a large increase in the cyclicity of the incomes of high-income households, coinciding with the rise in their share of aggregate income. In the United States, since top income shares began to rise rapidly in the early 1980s, incomes of those in the top 1 percent of the income distribution have averaged 14 times average income and been 2.4 times more cyclical. Before the early 1980s, incomes of the top 1 percent were slightly less cyclical than average. The increase in cyclicity at the top is to a large extent due to increases in the share and the cyclicity of their earned income. The high cyclicity among top incomes is found for households without stock options; following the same households over time; for post-tax, post-transfer income; and for consumption. We study cyclicity throughout the income distribution and reconcile our findings with earlier work. Furthermore, greater top income share is associated with greater top income cyclicity across recent decades, across subgroups of top income households, and, in changes, across countries. This suggests a common cause. We show theoretically that increases in the production scale of the most talented can raise both top incomes and their cyclicity.

Since the early 1970s, economic inequality in the United States—as measured by the distribution of wages and salaries, or of income more broadly, or of consumption expenditure—has been steadily increasing.<sup>1</sup> The consensus explanation for the general increase in inequality is that skill-

1. For wages and salaries this change was first documented by Bound and Johnson (1992) and Katz and Murphy (1992). The increase that began in the 1970s and 1980s continued

biased technological change has raised the earnings of individuals with more skills, as measured, for example, by education. However, accompanying this steady rise in inequality has been a much larger and more rapid increase in the income share of those at the very top of the income distribution. The share of (non-capital gains) income accruing to those in the top 1 percent of the income distribution increased from 8 percent in the early 1980s to 18 percent in 2008; the income share for those in the top 0.01 percent increased from around 0.7 percent to 3.3 percent over the same period (Piketty and Saez 2003, Saez 2010). Both the suddenness and the magnitude of these increases have shifted perceptions about the importance of technological change as the cause of increased income inequality generally and raised the possibility of an important role for other factors, such as “changes in labor market institutions, fiscal policy, or more generally social norms regarding pay inequality” (Piketty and Saez 2003, p. 3).

In this paper we bring together evidence from a variety of datasets to show that, as first argued in Parker and Vissing-Jorgensen (2009), another fundamental shift has occurred across the U.S. income distribution. During the past quarter century the incomes of high-income households have become much more sensitive to aggregate income fluctuations than previously. Before the early 1980s, the incomes of high-income households were more often than not less cyclical than the income of the average household. But since around 1982 the incomes of the top 1 percent have become more than twice as sensitive to aggregate income fluctuations as the income of the average household.

The fact that this increase in the cyclicity of income of the top 1 percent coincides with the increase in their income share suggests that a common cause underlies both phenomena. We provide further evidence for a link between increased income inequality and increased income cyclicity at the top by documenting, first, that across *income groups* within the top 1 percent, higher average income is associated with higher income cyclicity in the 1982–2008 period; second, that across *decades* since the 1970s, cyclicity of the top 1 percent increases decade by decade as that group’s income share increases; and third, across *countries*, increases in income

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through the 1990s and into the 2000s in the top half of the wage distribution (Autor, Katz, and Kearney 2008). On increasing inequality in consumption, see Cutler and Katz (1991), Attanasio and Davis (1996), and Heathcote, Perri, and Violante (2010). Although the survey information on households suggests that the increase in the overall distribution of inequality in expenditure has been significantly less than that observed for income, this may partially be an issue of measurement of expenditure (see, for example, Aguiar and Bils 2010).

cyclicality of the top 1 percent are highly correlated with increases in their income share.

We argue that these facts are not inconsistent with the hypothesis that the increase in top income shares was caused by rapid technological progress in information and communications technologies (ICT) since the early 1980s. If improvements in ICT have increased the ability of the most talented workers to handle more work or to scale their ideas by working with more production inputs, then the ICT revolution could have caused the incomes of the highest paid both to rise and to become more sensitive to economic fluctuations. The intuition is that individuals who have less decreasing returns to scale will operate at a greater scale (that is, with more production inputs) and have lower ratios of gross revenue to production costs, and therefore have greater sensitivity of earnings to business cycles.

Expanding on these contributions, we begin in section I by focusing on the details of the change in income cyclicality of top income groups in the United States. We use the Statistics of Income (SOI) data of Thomas Piketty and Emmanuel Saez (Piketty and Saez 2003, Saez 2010), which are based on tax records, to show that the average income (before taxes and transfers and excluding capital gains) accruing to those in the very top of the income distribution has moved substantially more (in percentage terms) than the overall average in each boom and each recession since 1982, on average rising 5.0 percentage points more per year in each boom and falling 3.7 percentage points more per year in each recession. Before 1982, however, this was not the case.

This high cyclicality is not simply due to capital or entrepreneurial income. High-income tax units (one or more individuals filing a single return) tend to have a significant share of income from wages and salaries (including bonuses), and this type of income has roughly the same exposure to fluctuations as their nonwage income. Wage and salary income is also a major source of the change in cyclicality of top incomes. Before 1982 the wage and salary income of high-income tax units was roughly acyclical, but since 1982 it has been highly cyclical. Also, we show that the top 1 percent of earners come from a broad range of industries and occupations, and we argue that no one industry's or occupation's pay structure is driving our finding.

Further, we provide three pieces of evidence that although high-income households are more likely to have stock options, our main finding is not driven by the potentially endogenous timing of the exercise of stock options. First, in the period since 1997 for which we have data, only about 22 percent of households in the top 1 percent have stock options (that is,

were given stock options during the preceding year or owned stock options when surveyed), and income cyclicality of households in the top 1 percent is roughly similar if one leaves out households with stock options. Second, for a sample of top corporate executives for whom we have information about the value of options granted, we find that income calculated by including options only when granted, rather than when exercised, is highly cyclical. To be clear, this evidence in no way rules out a causal explanation that involves a general rise in pay for performance—indeed, options income is highly cyclical for those who have options, and bonus income may serve a similar purpose for those in the top 1 percent without options income. Our point is simply that the high cyclicality of the wage and salary (and overall) income of the top 1 percent is not spuriously generated by a correlation between the timing of options exercise and aggregate fluctuations. Third, as a further piece of evidence that the high cyclicality is neither due to endogenous timing of income without economic significance nor due to other measurement problems in income data, we show that the cyclicality of the *consumption* of households in the top of the consumption expenditure distribution—specifically, the top 5 percent by initial consumption—is also more than twice that of the average household.

Additional evidence confirming the high cyclicality of top incomes comes from verifying the out-of-sample forecasts made in Parker and Vissing-Jorgensen (2009) based on cyclicality estimates that excluded the recent recession. Income data for 2008 and consumption expenditure data through February 2009 show sharp declines for the top 1 percent during the recent recession, consistent with these predictions.

How does this new fact relate to the prior literature that concludes that low-income households bear the brunt of recessions and benefit the most from expansions? In section II, using data from the Current Population Survey (CPS), we show that the incomes of low-education households are more cyclical than those of high-education households and that the greater cyclicality of the top 1 percent does not appear in the CPS before 1982. Further, looking at the whole distribution using a dataset from the Congressional Budget Office that merges the CPS with the SOI tax data on high incomes, we find that the sensitivity of the wage and salary income of households in the bottom two quintiles to fluctuations in aggregate income is slightly higher than that of households in the third and fourth quintiles and than that of households from the 80th to the 99th percentiles.

However, in the public CPS data for the period since 1982, when one ranks by percentile in the income distribution, the top 1 percent have a higher cyclicality than even the lowest education group (those with less than a high

school diploma). The cyclicity of the top 1 percent is even higher when measured using the CPS top 1 percent income series constructed by Richard Burkhauser and coauthors (2008, 2009) from underlying CPS data not subject to the top coding applied to the public files. Thus, top incomes are highly cyclical, but it is harder to observe this high cyclicity in the publicly available CPS data alone because of top coding, and because cyclicity is high only for very high income households. We conclude that across the distribution of incomes, cyclicity is asymmetrically U-shaped: it is higher for the bottom quintiles than for the middle and the upper-middle class, but much higher for the top 1 percent, and especially for the very highest incomes.

Different cyclicalities of taxes and transfers at different points in the income distribution can lead to differences in cyclicity between pre-tax, pre-transfer cash income and disposable (post-tax, post-transfer) income. We show that taxes and especially transfers significantly reduce the cyclicity at the bottom of the income distribution while making less difference to the cyclicity of the very top. Thus, the cyclicity of top 1 percent incomes relative to the rest of the population is even greater for disposable income than it is for pre-tax, pre-transfer income.

Having established and explored our main finding for the United States, in section III we present evidence from Canada, which has a different tax system, slightly different culture, and better available information on top incomes from tax records. In the Canadian tax data, top income cyclicity is quite similar to that in the United States during the past quarter century. Further, in the Canadian data we are able to follow families across years (that is, we use panel data). Families in the top 1 percent of the income distribution in one year have income changes to the next year that are almost twice as cyclical as for the average. This higher cyclicity for the top 1 percent is similar in repeated cross-sectional data and in panel data, suggesting that the availability of only repeated cross-sectional data in the U.S. tax data is unlikely to substantially affect the estimated U.S. cyclicalities.

Section IV presents evidence of a strong link between increased income inequality and increased income cyclicity at the top by exploiting variation across groups, decades, and countries. We split the top 1 percent into three groups (percentiles 99–99.9, 99.9–99.99, and 99.99–100) and document for the period since 1982 that across these groups, the higher the average income, the higher the income cyclicity. Furthermore, calculating cyclicalities by decade since 1970, we show that for a given top group, as its income share increases, the cyclicity of its income increases. Finally, comparing the period 1970–82 with the period 1982–2007 using data for 10 countries, we find that those with larger increases in the income