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Article
How powerful are fiscal multipliers in recessions?

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The impacts are considerably higher among populations with traditionally low rates of postsecondary attainment. For example, the estimated impacts on college attendance are 5.8 percentage points among black students, and 4.4 percentage points among those who were eligible for a subsidized school lunch at the time of the original experiment. Among students attending schools with low quality classroom assignment, small class assignment raised the rate of college attendance by 7.3 percentage points, and among students with the lowest projected probability of attending college, the impact is 11 percentage points. In addition, small classes in the early grades improve the likelihood of earning a college degree, and in a more technical and high-earning field, such as science, technology, engineering, mathematics, business, or economics.

Using administrative tax return data, we are able to broaden our scope of the adult outcomes studied in the Project STAR experiment. John Friedman, Nathaniel Hilger, Emmanuel Saez, Danny Yagan, and I analyze a large number of outcomes ranging from earnings to retirement savings, homeownership, and marriage. While we study long-term impacts of classroom assignment to a variety of observable characteristics such as class size and teacher experience, we also estimate “classroom effects” — the combined effects of teachers, peers, and other class-level shocks — on later life outcomes. An analysis of variance revealed that kindergarten classroom assignment has significant impacts on earnings and other adult outcomes, leading us to ask whether classroom assignment impacted earnings were correlated with class effects on other adult outcomes, leading us to significant impacts on earnings and
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In both Project STAR papers, we find that the actual long-run impacts were larger than what would have been predicted based on the short-run test score gains. This finding is consistent with a growing body of research on early-life interventions, and raises challenging evaluation problems. Policymakers often rely on short-term outcomes such as standardized test scores to gauge the effectiveness of educational interventions. But, as suggested in our research, if these measures are systematically underestimating the true long-run impacts of early childhood programs, over-reliance on short-run outcomes may lead to abandonment of some policies that would pass a long-term cost-benefit analysis.


In policy and academic discussions of recent years, few topics have generated more interest than fiscal multipliers, which measure how much a dollar of increased government spending or reduced taxes raises output. Indeed, the magnitude of fiscal multipliers is at the core of debates about whether government should try to stimulate their economies during a recession. Bitter disagreement in the United States and elsewhere about the course of fiscal policy during the Great Recession reflects in part how little is known about multipliers and how important this matter is for policy.

While previous research studied the effects of fiscal policy on the economy, a key question is how powerful fiscal policy is. Returns to government spending during a recession which the need to stabilize economic activity is particularly acute. With a quickly shrinking economy in late 2008 and early 2009, existing estimates of the average effect of fiscal stimulus were potentially misleading. For example, some economists emphasized that increased government spending might stimulate output and have little effect on prices in times of slack but could have an inflationary effect with low output response if the economy were close to full employment. More recent theoretical work made similar predictions in the context of a binding zero lower bound for nominal interest rates, based on the view that a fiscal stimulus would not lead to an increase in interest rates in such a circumstance. While reasonable to expect, cyclical variation in the size of the government spending multiplier is in part how little is known about multipliers and how important this matter is for policy.

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In our initial work on this question we use a “smooth transition vector autoregression” (STVAR) that allows for transition of the economy between broad regimes characterized by potentially different responses to fiscal shocks. With only a handful of post-World War II recessions, generally short in length, a key advantage of this approach is that it exploits intensive as well as extensive margins of business cycle fluctuations. What matters is not only whether the economy is in a recession but also how deep the recession is. Our approach postulates a function measuring the probability of being in a given regime (recession or expansion) that depends on the state of the economy. For controlling for real-time expectations about fiscal variables generally increases the difference in the size of the government spending multiplier across the regimes. Note that this variation in the multiplier applies broadly to recessions vs. expansions in the sense that our results are not driven by the recessions vs. expansions in the sense that our results are not driven by the recent U.S. experience of very low short-term interest rates and a binding zero lower bound. Our estimates suggest that fiscal policy could be a powerful tool to stabilize output and thus reduce adverse effects of business cycles.

In subsequent work, we investigate whether the government spending multiplier varies over the business cycle in other countries as well. Introducing a multi-country dimension increases the overall number of episodes of economies which exhibit slack or which are in recession, possibly allowing us to move beyond the shorter estimates of fiscal multipliers. However, the international dimension poses several statistical and computational challenges for STVARs, such as correlation of error terms across countries. To address these challenges, we introduce the method of direct pro-
Alan Auerbach is the Robert D. Burch Professor of Economics and Law and directs the Burch Center for Tax Policy and Public Finance at the University of California, Berkeley, where he has taught since 1994. Auerbach has been an NBER research associate since 1978, the year he received his Ph.D. from Harvard University and joined the NBER’s Program in Business Taxation and Finance, the ancestor of today’s Public Economics Program. He also is a member of the Economic Fluctuations and Growth Program. His research interests span the fields of public economics and macroeconomics, with a particular focus on government spending, on fiscal policy and the effects and limitations of state-dependent multipliers. Specifically, this approach involves estimating a series of linear regressions for different horizons, thus making statistical analysis straightforward and robust. Using direct projections also allows us to radially increase the number of variables we can study because this framework is a single-equation approach and thus avoids the “curse of dimensionality” plaguing simultaneous estimation in VARs. Furthermore, this approach can easily accommodate fiscal shocks that are orthogonal to the fiscal predictions of professional forecasters. Using data for OECD countries and our approach of direct projections, we find that shocks to government spending — identified as innovations in government spending purged of fiscal forecasts made by the OECD staff — lead to stronger output responses in recessions than in expansions. We see the same pattern when regimes are defined based on current output levels rather than growth rates (i.e., boom vs. slack rather than expansions vs. recession). We also use the direct projections framework to examine responses of other macroeconomic variables — such as investment, consumption, employment, wages, and prices — to government spending shocks at the state level, in the business cycle. By and large, the estimated responses are consistent with the old-style Keynesian view: Excess capacity is associated with larger government spending multipliers and smaller effects on prices. The focus of this exercise was to examine domestic multipliers: If Germany has a government spending shock, how much does the German economy respond to the shock? How would the world economy be integrated and a shock in one country can spill over to other countries. To the extent that fiscal spillovers are strong, there may be added benefits to countries’ adoption of fiscal stimulus. Countries with strong fiscal capacity, like Germany, can help stimulate the economies of countries with weak fiscal capacity, like Greece, but spillovers from abroad also may upset economic stability. Despite the potential importance of fiscal spillovers, there has been little work on the subject. In a paper based on the same data set as the previous one, we make progress in several dimensions. First, our sample of OECD countries is larger and more diverse than those used in previous research. Second, we again remove predictable innovations in government spending using professional forecasts. Once each country’s fiscal shocks are calculated, we compute external shocks for each country as a weighted average of other countries’ domestic shocks, using weights based on bilateral trade volumes. Third, we use the method of direct projections to allow the size of fiscal spillovers to depend on the state of the economy, in particular recession vs. expansion. Our macroeconomic past is characterized by relatively small business-cycle fluctuations. This data challenge is not insurmountable, however. First, as already noted, one can use variations in economic strength throughout the postwar period, not simply focusing on episodes of recession, to estimate state-varying fiscal multipliers. Second, one can focus on countries with more postwar volatility, or use longer time series with more frequent or volatile recessions, to obtain more variation in the data. We take the first of these approaches in looking at the experience in Japan, which has had a long period of economic weakness and thus potentially allows us to estimate more precisely multipliers in an economic downturn. One can also conmerge multipliers; the mapping from estimated responses at the local level to macroeconomic responses is not straightforward, as some elements of local responses may overstate or understate national responses — because of factors such as national supply constraints — while others may underestimate them because of effects such as positive regional spillovers. A promising alternative to longer time series or exploiting local variation is the use of high-frequency data, which can provide many observations even in precisely defined regimes, can sharpen identification of fiscal shocks, and can keep the level of the analysis at an aggregate level. To illustrate the power of this approach, our most recent work involves the construction of daily series on the special fiscal spending commitments by the U.S. Department of Defense (DoD).11 It is highly unlikely that changes in DoD spending or DoD commitments on a given day are driven by developments in the economy. As a result, the commonly used minimum delay restrictions in the standard fiscal spending approach cannot react to changes in the economy within a narrow time window — likely to be satisfied. Hence, the chain of causality from changes in government spending to changes in macroeconomic outcomes is even more direct, based on fiscal decisions based on quarterly data. Using high-frequency data on fiscal variables can also radically improve our ability to estimate when economic agents learn about changes in fiscal variables and when economic variables react to changes in fiscal variables. Of course, analysis at a daily frequency rules out analysis of responses of slow-moving variables like GDP or the unemployment rate, leading us to consider factors such as exchange rates and interest rates that can respond immediately.14 Using our daily series of defense spending announcements, we are able to estimate an exchange-rate puzzle in the previous literature.15 With fiscal shocks identified from actual spending data at a quarterly frequency, the U.S. dollar depreciates after a positive government-spending shock, even though the overwhelming majority of macroeco-
nomic models predict an appreciation. We demonstrate that this puzzle evaporates when one considers responses at a higher frequency: On average, on days when the DoD announces more spending, the U.S. dollar appreciates significantly. Thus, the standard macroeconomic framework is suitable for analyses of the international effects of fiscal shocks.

During the Great Recession, countries around the world adopted expansionary fiscal policies aimed at countering the large negative shocks to their economies. These actions occurred in spite of skepticism among many economists about the potential of fiscal policy to stimulate economic activity. The results of our related work suggest that fiscal policy activism may indeed be effective at stimulating output during a deep recession, and that the potential negative side effects of fiscal stimulus, such as increased inflation, are also less likely in these circumstances. These empirical results call into question the results from the new Keynesian literature, which suggests that shocks to government spending, even when increasing output, will crowd out private economic activity. While there has been some recent progress providing a rationale for large multipliers when economies confront a binding zero lower bound on interest rates, our findings have deepened our understanding of the sources, magnitude, and persistence of U.S. racial inequality, and his evaluations of various policies that are designed to improve economic opportunities for disadvantaged children. It calls Fryer “the leading economist working on the economics of race and education.”

Fryer is the Henry Lee Professor of Economics at Harvard University and a research associate in the NBER Labor Studies and Education programs. He received his B.A. from the University of Texas at Arlington in 1998 and his Ph.D. from the Pennsylvania State University in 2002.

Other current NBER research associates who have received the Clark Medal include Daniel McFadden, Martin Feldstein, Joseph Stiglitz, James Heckman, Jerry Hausman, Stanford Grossman, Paul Krugman, Lawrence Summers, David Card, Kevin Murphy, Andrei Shleifer, Steven Levitt, Daron Acemoglu, Susan Athey, Emmanuel Saez, Esther Duflo, Jonathan Levin, Amy Finkelstein, Raj Chetty, and Matthew Gentzkow. Other NBER associates who won the Clark Medal are Franklin Fisher, now an emeritus member of the Board of Directors, and the late research associates Gary Becker, Milton Friedman, and Zvi Griliches.

Retirement & Health Benefits in the Public Sector

An NBER conference, “Retirement & Health Benefits in the Public Sector,” took place in Cambridge on April 10–11. Research Associates Robert L. Clark of North Carolina State University and Joseph P. Newhouse of Harvard University organized the meeting. These papers were discussed:

- Jeffrey R. Brown, University of Illinois at Urbana-Champaign and NBER, and George Pennachhi, University of Illinois at Urbana-Champaign, “Discounting Pension Liabilities: Funding Versus Value” (NBER Working Paper No. 21276)
- Jeffrey Clemens, University of California, San Diego, and NBER, and David M. Cutler, Harvard University and NBER, “Impact of ACA on State and Local Health Plans”
- Alan R. Weil, Project Hope, “State Health Plans and Their Impact on State Budgets”
- Robert L. Clark and Emma Hanson, North Carolina State University; and Olivia S. Mitchell, University of Pennsylvania and NBER, “Lessons for Public Pensions from Utah’s Move to Pension Choice”
- Alicia Munell, Jean-Pierre Aubry, and Mark Cafarelli, Boston College, “COLA Cuts in State-Local Pensions”

Conferences