I. Introduction

Gale and Samwick (2016) review both simulation, traditional econometric, and more modern “narrative” literatures and discuss the strengths and weaknesses of the evidence in each subfield. In this comment, I reexamine the evidence and at times suggest different conclusions.

II. The recent econometric literature exploring the link between taxes and growth

There has been a recent surge in the production of macroeconometric papers finding a strong link between taxes and economic growth using a narrative approach to identify exogenous tax changes. Romer and Romer (2010) find that a tax increase of 1% of GDP lowers output by 3% over ten quarters when one examines only the exogenous tax changes. Others have pursued a similar strategy with data from other countries. The U.K., Cloyne (2013) notes, for its part offers a centralized legislative process with centralized documentation that eases narrative analysis and a sample that includes five times as many post-WWII tax changes as the U.S. In an echo of the original estimates of Romer and Romer (2010), Cloyne (2013) estimates that a 1% cut in taxes as a share of GDP increases output by up to 2.5% over three years based on this U.K. sample. As Cloyne (2013) turns to the U.K., Hayo and Uhl (2014) pivot to the German context, examining a sample from 1974 to 2010. They estimate that a tax increase of 1% of GDP cumulatively lowers output by as much as 2.4% over eight quarters. These estimated output effects from the U.S., U.K., and German contexts range only from 2.4% over eight quarters to 3% over ten quarters.

Other studies distinguish between average tax rates and marginal tax rates, the latter of which tends to be the most relevant for policy discussions. Constructing a time-series of average marginal U.S. federal income tax rates from 1912 to 2006, Barro and Redlick (2011) repurpose a variation of the Romer and Romer (2010) identification strategy to construct an instrument for changes in average marginal tax rates (AMTRs). They find that a decrease in the AMTR of 1% increases per capita GDP by .5% after a period of one year. Deploying a vector autoregression, Mertens (2015) estimates a peak output effect from a 1% decrease in the AMTR on real GDP of 1.5%, though the sample includes only changes to personal tax rates and, in the interest of avoiding anticipation effects, excludes tax reforms with an implementation gap between the time of legislation and the time of implementation of one year or more.

Gale and Samwick (2016) point out that the long-run effects of tax reform depend on supply-side effects, but that this evidence, which tends to find statistically significant short-run growth effects, does not necessarily imply that this type of effect is present. They also suggest that the immediate short-run responses are more consistent with Keynesian effects than supply-side tax effects. I find the evidence in favor of supply-side effects more compelling than they suggest for a number of reasons.

First, the existing evidence is consistent with the presence of long-run effects on the level of output. That is, the estimates suggest that the growth rate of output following a tax cut increases relative to what it would have been in the absence of the tax shock—and these elevated
growth rates are not fully offset by output developments in later time periods. Thus, there is a permanent effect on the level of output, just as the tax models would suggest. Evidence of even a temporary and significant increase in the growth rate of output, then, serves as evidence of a long-run effect on the level of output (assuming that the increase in the growth rate of output is not offset by negative growth effects in later time periods). The baseline specification, for example, in Romer and Romer (2010) is a linear regression that uses the growth rate of real output as its dependent variable. Hayo and Uhl (2014), note that “due to concerns about the non-stationarity of our data, we estimate the model using first differences of macroeconomic variables.”

Second, the authors fail to factor in the attempt in Mertens and Ravn (2013) to disentangle supply and demand-based effects. The response of inflation to cuts in the average corporate income tax rate offers insight into whether observed output effects operate through demand or supply-based channels. If cuts to the average personal income tax rate (APITR) or the average corporate income tax rate (ACITR) increase output but also raise inflation, this would suggest that demand-driven channels are at work. If, on the other hand, cuts increase output but also reduce inflation, this would constitute evidence that supply-side channels are at work. Consistent with the dominance of the supply-side channel, Mertens and Ravn (2013) find a reduction in inflation following a 1% cut to the ACITR. Though the estimated cumulative decline after one quarter of .35% then increases for the duration of the sample, the point estimate for the effect of the ACITR on inflation still remains negative for the whole of the sample. And this combination of positive growth effects and disinflationary effects only makes sense if the growth rate of supply is exceeding the growth rate of demand as it also works to increase output.

The third reason why these results seem unlikely to be driven by cyclical factors is that the timing of the tax changes appears to be exogenous to the business cycle, as the authors in the narrative-based literature have assumed. If the output effects were generated through demand-side channels, then one might expect that exogenous tax cuts tended to occur during times of weak economic growth. If the tax cuts are truly exogenous, then they should be distributed through the business cycle evenly.

To test whether this was the case, we turned to data on the arrival of “bad times” in the business cycle and the dates of exogenous tax cuts in the U.S., the U.K, and Germany taken from the papers cited above. As our proxy for the arrival of “bad times,” we turned to the OECD Composite Leading Indicators (CLI) series for each of the three countries (e.g., OECD 2015). According to the OECD, the CLI series identify business cycle downturns through a deviation-from-trend approach that measures when output measures deviate from their trend (OECD 2016). We then divided the total number of quarters for which the OECD indicator indicated a cyclical downturn by the total number of quarters in the country’s exogenous tax shock series. This offers a “placebo” benchmark of how frequent business cycle slowdowns tend to occur in that country during the sample period.
If the occurrence of an “exogenous” tax cut were unrelated to business cycle conditions, after all, we would expect the frequency with which exogenous tax cuts coincided with business cycle downturns to match the frequency with which business cycle downturns occurred in general. To gauge if and how a country’s historical experience of exogenous tax cuts compares to this a priori benchmark, we then divide the number of quarters in which there was both an exogenous tax cut and a negative reading on the OECD indicator by the total number of exogenous tax cuts that occurred in the sample period. You can think of this as measuring the odds of an exogenous tax cut happening during a period when the OECD indicator turned negative.

Together, these metrics allow us to gauge whether the frequency of an “exogenous” tax cut coinciding with a negative reading on the OECD indicator exceeds the frequency that one would expect to observe if an exogenous cut were equally likely to happen during all states of the cyclical economic conditions. And as one can see in the figure below, the frequency with which exogenous tax cuts during business cycle downturns precisely matches the frequency with which they occur in general in the case of the U.S. and the U.K., and is not far off in the case of Germany. This lends credence to the notion that what the literature regards as exogenous tax cuts are truly exogenous, rather than endogenous tax cuts masquerading as “exogenous” tax cuts.

![Figure 1. "Exogenous" tax cuts](image-url)
Further evidence against the claim that exogenous tax cuts tend to happen during recessions comes from the lack of a correlation between their occurrence in the U.S., U.K., and Germany. Given the well-known co-movement of business cycles in each country, if exogenous tax shocks were in fact responses to business cycle movements, then one would expect to observe substantive correlations. Yet, as Table 1 shows, the correlations between the exogenous tax shock measures in different countries is remarkably close to zero. Table 1 is based on the author’s calculations and data extracted from the individual papers that construct exogenous tax shock series in each of the three countries.1

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### III. Can theory explain the large effects in the literature?

Gale and Samwick (2016) suggest that the literature supports the notion that labor elasticities tend to be lower than those who believe output responses to tax cuts would be large would be inclined to believe. While it is true that the literature has in general tended to favor lower elasticities, as they intimate, recent developments suggest that heterogeneity may play an important role, and models that account for it can lead to very large labor supply responses to taxation.

Keane and Rogerson (2012) summarize the key arguments. When human capital is present, the costs borne by an individual who chooses to reduce labor supply are more than just the opportunity cost of the lost wages. Rather, the opportunity cost of time is the sum of the direct cost of the lost wages and the present value of the human capital that would have accrued to the worker, had that worker worked the extra hour. The chart below, from Keane and Rogerson (2012), illustrates how the role of human capital changes the wage schedule over the course of the life cycle:

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1 Specifically, the data on exogenous changes are from data posted online in conjunction with Romer and Romer (2010) in the case of the United States; from data posted online in conjunction with Cloyne (2013) in the case of the United Kingdom; and were constructed based on data delineated in Table A1 of Uhl (2013), a companion paper of Hayo and Uhl (2014), in the case of Germany. All correlations are for the longest sample permitted by each pair of exogenous tax series. And the data span Q1 1945 through Q4 2007 in the case of the United States; Q1 1948 through Q4 2009 in the case of the United Kingdom; Q1 1964 through Q4 2007 in the case of Germany.
Early in life, the opportunity cost of time includes a large human capital component. This means that the opportunity cost of time (the purple line) has a different shape than the wage profile. Hours (the black line) tend to move with the opportunity cost of time, but not to move with wages so clearly. If one estimates the labor response with the wage curve, then, one acquires a downwardly biased estimate of the response. And as the figure would suggest, the literature finds that older workers respond much more than younger workers to changes in tax rates.

It is easy to generate very large effects from taxes once one relies on these larger effects. For example, DeBacker et. al. (2015) model the effects of an across-the-board 10% statutory cut to marginal tax rates, they estimate that such a reform would result in a contemporaneous GDP increase of 1.64%. Though the growth rate effects diminish as time goes on, it remains 1.56% even five years after the tax cut and sits at 1.55% in the steady-state. This evidence provides some theoretical support for the large responses found in the narrative literature. Most interesting, it suggests that the effects can be immediate even in a model with no demand-side Keynesian effects. They get large responses up-front because the labor response happens immediately. Thus, there is no reason to believe that the large immediate effects in the narrative

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2 They deploy OG-USA, an overlapping generations model of the US economy, incubated by the Open Source Policy Center and available for wide use through a web application at [www.ospc.org/taxbrain](http://www.ospc.org/taxbrain).
V. The recent tax increases

Let us now consider the experience of the recent marginal tax rate hikes under President Obama.

First, as can be seen in Figure 3, labor force participation has changed in the way suggested by the human capital framework developed in Keane and Rogerson (2012). According to that framework, younger individuals are less responsive to changes in marginal tax rates because the present value of human capital accumulation increases as the quantity of an individual’s expected future years in the labor force increases. Since current tax rates do not affect the present value of human capital, this would suggest that the labor force participation of younger individuals would drop more than the labor force participation of older individuals in response to the Obama-era marginal tax rate increases. The data, from the Bureau of Labor Statistics (2015), evince precisely this pattern.

![Figure 3. Labor force participation since recent MTR hike](image)

So the apparent labor force participation effects are consistent with the Keane and Rogerson (2012) theory. This suggests that the economic effects could have been significant. Figure 4 plots the forecast error of Obama Administration growth forecasts on top earners against the effects of the marginal tax rate increase as estimated by Mertens (2015). The Obama administration, which seems to have shared the view of the authors, missed the economic
forecast by almost exactly the estimated impact of the tax hikes. Figure 4 is based on the author’s calculations using data from the Office of Management and Budget (2013) and Mertens (2015).³

As such, it seems that much of the Obama Administration’s forecast errors for growth in 2013 and 2014 could be explained if they held the same belief that Gale and Samwick (2016) are arguing in favor of: that tax rates do not affect growth.

As a final observation, the authors discuss at great length the importance in simulations of the method of “squaring the circle” when taxes are cut. If future tax hikes are used to restore the revenue, then according to economic theory the effects of the tax change today should be small. If government spending cuts are used, by contrast, then according to economic theory the tax effects should be large. It is worth noting that the empirical literature does not explore this question of ultimate “pay-for,” yet still finds large effects. This seems best explained by one of two explanations. Either the markets assume that the shortfall will be paid for with future spending cuts or, alternatively, economic agents who observe massive and persistent deficits that dwarf the magnitude of many tax changes simply assume that the long-run situation is little changed by current policy.

References

³ Specifically, the data from Mertens (2015) used are the estimates of the effects of a one percentage point increase in the marginal tax rate featured in the middle-left panel of Figure 8.


Organization for Economic Cooperation and Development. 2015. “OECD based recession indicators for Germany from the peak through the trough (DEURECM); OECD based recession indicators for the United Kingdom from the peak through the trough (GBRRECM); OECD based recession indicators for the United States from the peak through the trough (USARECM).” Data accessed through Federal Reserve Economic Data (FRED) Excel add-on.


World Bank World Development Indicators. 2015. “GNI per capita, PPP (constant 2011 international $).” Data extracted in May 2015.
