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Trickle Down? A little bit

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Abstract

The new tax plan approved by the U.S. Senate, the Tax Cuts and Jobs Act, claims to offer the largest benefits to individuals in the middle of the income distribution. In this article, I examine the impact exogenous tax changes have on income shares of individuals in the bottom 50 percent of the income distribution. The findings suggest that lower taxes, that are exogenous to fluctuations in business conditions, have minimal direct benefits for individuals in the bottom 50% of the income distribution. Claims that trickle-down economics lift all income shares through lower taxes are not supported by the empirical findings.

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1. Introduction

Much literature concludes that greater redistribution of income requires higher marginal tax rates. Lindsey (1987) was one of the first to point out that the 1981 top rate cut in the Economic Recovery Tax Act of 1981, or ERTA, from 70% to 50% coincided with a very large increase in the share of income reported to the IRS by the top 1% of the income distribution. He argues that the tax cut was a principal cause of this increase, as it reduced the penalty for receiving (or, to be precise, reporting) taxable income. Feenberg and Poterba (1993) document that the share of income reported by the top 0.5% of the population increased slowly but steadily beginning in 1970, accelerated around 1980, and shot up in 1986. They contend that this trend is consistent with the pattern of declining effective tax rates on affluent Americans that began in 1970 and picked up steam with the rate cuts of 1981 and 1986. Karoly (1994) presents Census Bureau data showing that inequality among families, after reaching a post-war low in 1967-68, began to increase during the 1970s and continued to rise through the 1980s. Although the trend toward greater inequality began in the late 1960s, about two-thirds of the increase in the Gini coefficient between 1968 and 1989 occurred between 1980 and 1989. Bakija and Slemrod (2000) show that the top rate increases of 1990 and 1993 increased progressivity, but the expansion of capital gains tax preferences in 1997 and, possibly after, offset the higher top rates. Milanovic and Taleb (2015) demonstrate that, given the current state of world income distributions, top income earners may work harder to increase their relative status rather than promote overall economic growth within a country (i.e. it is easier to lobby for a change in tax law than to improve GDP growth). This would then tend to increase inequality as legislation is passed that, relatively speaking, benefits top earners more than low or middle-income families. Saez and Zucman (2016) attribute at least part of the rise in inequality to the rollback of New Deal-era legislation since the 1980s. Namely, taxation has become less progressive and financial deregulation has potentially allowed financially and politically connected families and firms to accumulate large amounts of wealth.

However, recently, the new tax plan (the Tax Cuts and Jobs Act) approved by the U.S. Senate, contains the largest benefits for individuals in the middle of the income distribution. In 2019, people in the middle of the income distribution, earning approximately $50,000 to $70,000 annually would see their tax burden drop by 7.1 percent. Individuals earning between $20,000 and $30,000 would experience a 10.4 percent decrease in their tax liabilities; whereas, high income earners would get a 5.3 percent tax cut[1]. It should be noted that the new tax plan has received criticism in regard to disproportionately benefiting households at the upper end of the income distribution, which may further exacerbate income inequality in the U.S. Critics assert that the new tax plan, by doing away with the alternative minimum tax and the estate tax, provides a larger benefit to top earners.

To get a better picture of how changes in taxes affect the middle class, in this paper I examine the impact exogenous tax changes have on the income shares of individuals in the bottom 50% of the income distribution. The analysis allows us to better understand if the benefits of the higher potential output from lower taxes trickle down to individuals in the bottom 50% of the income distribution. To preview the results, I find that a one-unit positive shock to exogenous tax rates leads to an approximately 1.5% decrease in the real GDP growth rate and a 0.3% decrease in the national income shares of individuals in the bottom 50% of the income distribution. The findings suggest that lower taxes that support long-run growth have minimal direct benefits for individuals in the bottom 50% of the income distribution.

[1] https://www.politico.com/story/2017/11/12/tax-middle-class-republicans-244815

The rest of the article proceeds as follows: Section 2 discusses the data and the methodology, Section 3 presents results and Section 4 concludes.

2. Data and Methodology

2.1 Data

The annual data used to capture the shares of pre-tax national income attributed to individuals in the bottom 50% of the income distribution are from the World Wealth & Income database. Pre-tax national income is the sum of all pre-tax personal income flows accruing to the owners of the production factors, labor and capital, before taking into account the operation of the tax/transfer system, but after taking into account the operation of the pension system. The population is comprised of individuals over age 20. The base unit is the individual (rather than the household), but resources are split equally within couples. The time-series of the pre-tax national income shares for the bottom 50% are shown in Figure 1. The annual measures of tax changes are from Romer and Romer (2010). Particularly, exogenous tax changes are changes that are not taken to offset shocks that push growth away from normal. These tax changes are used to raise normal growth and are different from the counter-cyclical changes in marginal taxes. Romer and Romer (2010) identify exogenous tax changes from the narrative record, such as presidential speeches and Congressional reports, in two ways. The first narrative includes the absence of any discussion of counteracting shocks or of a desire to return growth to normal. The second narrative has to do with the reasons given for tax changes, such as identifying that tax changes are not related to other factors affecting output in the near future. Romer and Romer (2010) categorize two types of exogenous tax changes: those for deficit reduction and those for long-run growth. Figure 2 shows the time-series of the exogenous tax changes. All of the tax increases were deficit-driven. However, the tax cuts were mainly enacted to support long-run growth. Real GDP data used to control for the dynamics of output is from the FRED database. The sample period analyzed is 1962 to 2014.

2.2 Methodology

The model specification used to capture the dynamics between the exogenous tax changes and income shares of individuals in the bottom 50% of the income distribution is similar to the model specification in Romer and Romer (2010). Thus, I estimate[2]:

$$\Delta Bottom50_t = a + \sum_{i=1}^{M} b_i \Delta T_{t-i} + \sum_{j=1}^{N} c_j \Delta Y_{t-j} + e_t \quad (1)$$

where *Bottom50* captures the pre-tax national income shares of the individuals in the bottom 50% of the income distribution[3] and ΔT are Romer and Romer's (2010) exogenous tax changes. Since the tax series, ΔT, reflects policies adopted for reasons unrelated to other factors that might influence real output and income distribution in the near term, Romer and Romer (2010) assert that the model specification in (1) should yield unbiased results. Again, including lags of real output helps control for the dynamics of output that might influence the relationship between the

[2] Note, cointegration is not an issue in eq. (1) because tax changes do not have a unit root. As such, the three variables do not share a common trend. Results are reported in the appendix.

[3] As a robustness test, I perform the analysis using post-tax national income shares for the individuals in the bottom 50 percent of the income distribution. As presented in the results section, there are no differences in the findings.

bottom 50% of national income shares and overall economic performance. To ensure that there is no reverse causality from the bottom 50% of national income shares and real GDP to tax changes, Granger causality tests are performed. The results show that the tax shocks are unrelated to past changes in real GDP or the bottom 50% of national income shares[4].

3. Empirical Results

Cumulated impulse responses from equation (1) are estimated using a one-year lag[5]. Figure 3 shows the implied effect of a shock of one percent of GDP to the tax series on the path of real GDP and the national income shares for the bottom 50%. The figure shows that the effect is consistently negative for both variables. After a shock to exogenous tax changes, real GDP drops by approximately 1.5 percent and national income shares for the bottom 50% drop by 0.3 percent. The findings imply that tax cuts spur subsequent economic growth; however, the direct impact on the national income shares for individuals in the bottom 50% of the income distribution seems to be minimal. Implications of trickle-down economics that low taxes lift all income shares are not supported by the empirical findings. In addition, in the appendix section, I present the contributions of tax changes in explaining the variance of the prediction error of real output growth and national income shares for the bottom 50%. The results confirm the exogeneity of tax changes. None of the other variables have any predictive power over tax changes. In contrast, 17 percent of real GDP squared prediction error and 10 percent of the bottom 50% of national income shares squared prediction error are attributed to innovations in tax changes.

Lastly, in Figure 4, cumulated impulse responses for post-tax national income shares are shown. The results are quantitatively and qualitatively similar to the previous results.

4. Conclusion

Using Romer and Romer's (2010) exogenous tax changes, I analyze if tax cuts support economic growth and lift up the income shares of individuals in the bottom 50% of the income distribution. The empirical findings show evidence against the implications of trickle-down economics: that low taxes lift all income shares. Particularly, I find that an innovation to exogenous tax changes leads real GDP to drop by approximately 1.5% and national income shares for the bottom 50% to drop by 0.3%. This implies that tax cuts would raise income for the bottom 50% of income earners but not by very much.

[4] Results are reported in the appendix.

[5] Lag length tests using the Akaike Information Criterion are presented in the Appendix in Table I, which suggest a one-year lag.

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Figure 1: Time Series of Pre-Tax National Income Shares: Bottom 50%

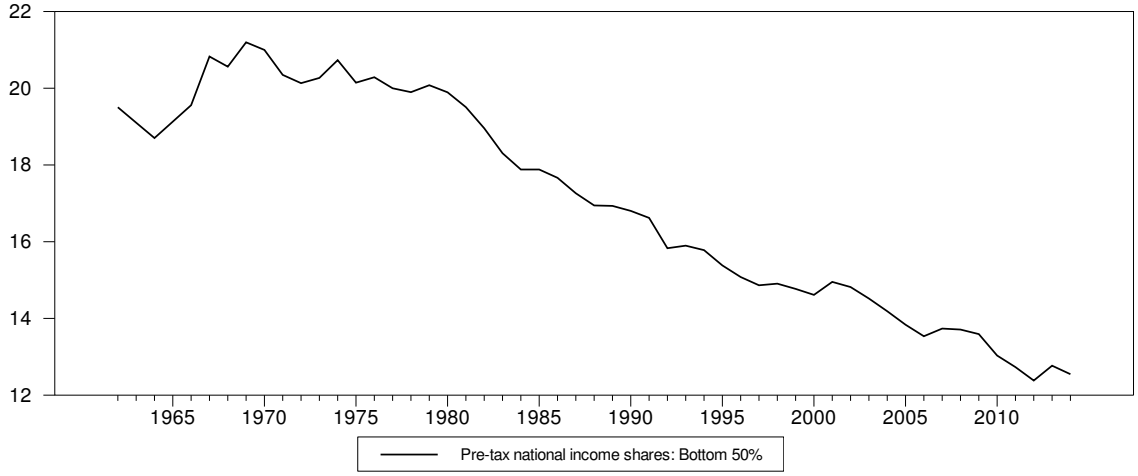


Figure 2: Time Series of Exogenous Changes in Taxes

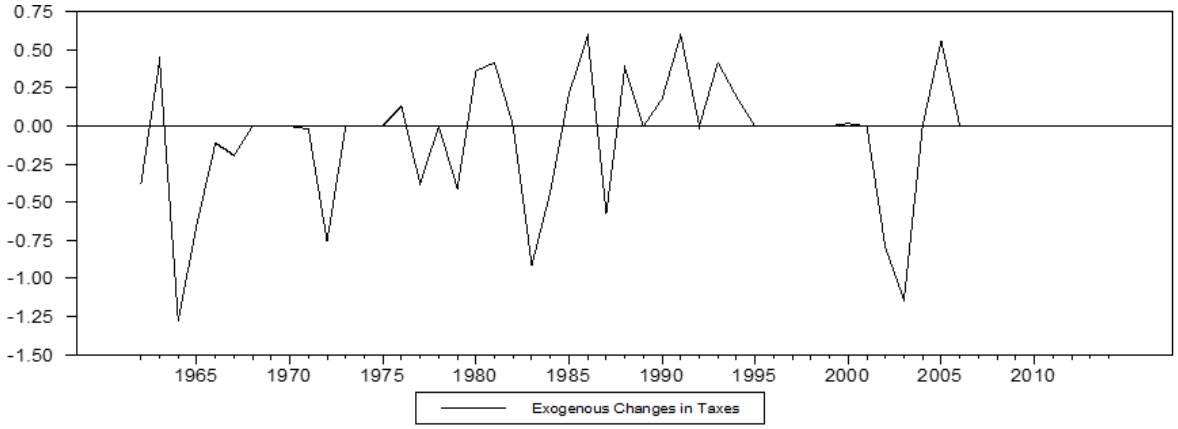


Figure 3: Responses of Real GDP and Bottom 50% (Pre-Tax) to a unit shock in Exogenous Tax Changes

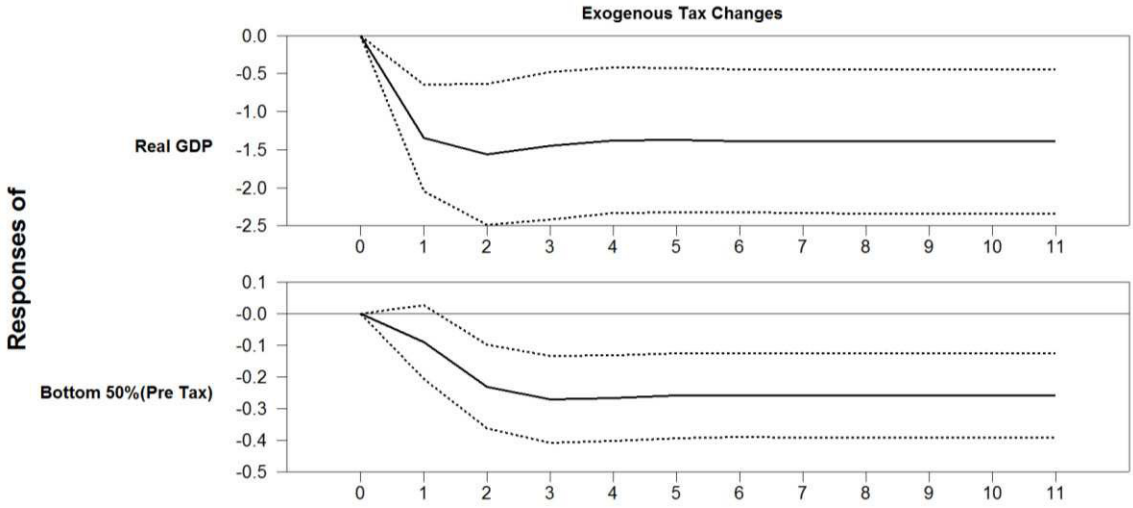
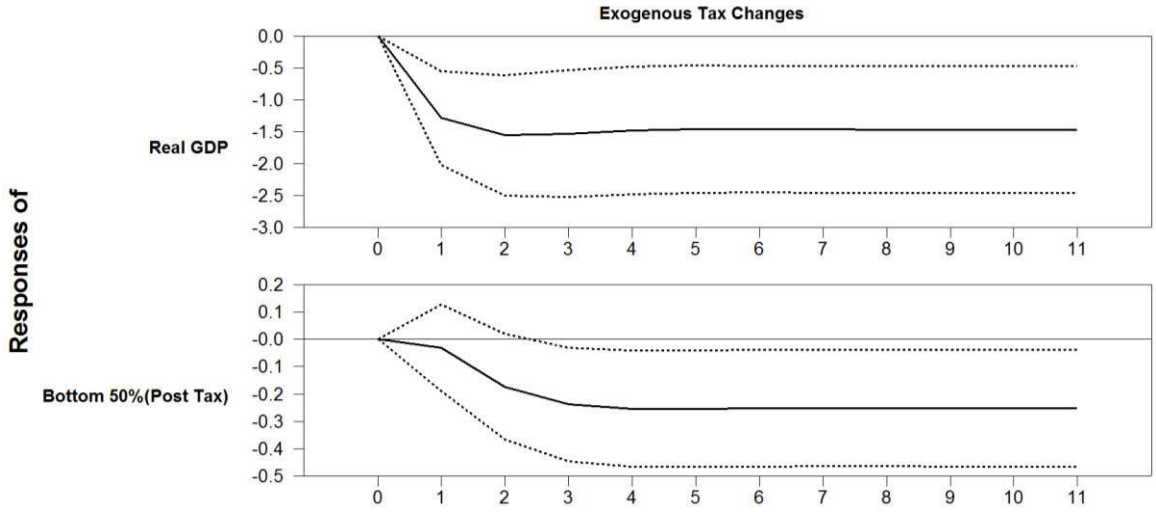


Figure 4: Responses of Real GDP and Bottom 50% (Post-Tax) to a unit shock in Exogenous Tax Changes



Appendix

1. Results from Table I suggest that the optimal lag for estimating equation (1) is one-year lag.

Table I: VAR Lag Selection Criteria	
Lags	AIC
0	5.80
1	5.54*
2	5.79
3	6.30
4	6.87

2. For the variables to be cointegrated, the requirement is that all three variables need to have a unit root. Referring to Phillips-Perron Test in Table II and KPSS Tests in Tables III&IV, we observe that exogenous tax changes do not have a unit root. As such, all three variables do not share a common trend.

Table II: Phillips-Perron Test for a Unit Root[6]				
Sign. Level	Crit. Values	TestStat		
		Ex. Taxes	RGDP	Bottom 50%
1%	-3.55	-6.44***	-2.72	0.42
5%	-2.91			
10%	-2.59			

Table III: KPSS Test for Stationarity about Level[7]				
Sign. Level	Crit. Values	TestStat		
		Ex. Taxes	RGDP	Bottom 50%
1%	0.739	0.24	1.16**	1.09**
5%	0.463			
10%	0.347			

Table IV: KPSS Test for Stationarity about Trend				
Sign. Level	Crit. Values	TestStat		
		Ex. Taxes	RGDP	Bottom 50%
1%	0.216	0.113	0.17**	0.15**
5%	0.146			
10%	0.119			

[6] The null hypothesis under the Phillips-Perron Test is that series are non-stationary.
[7] The null hypothesis under the KPSS Test is that series are stationary.

3. To reassure that Romer and Romer's (2010) tax changes are exogenous, Granger causality tests are performed. As shown in Table V, the growth rate in real GDP and changes in the bottom 50% of national income shares do not Granger-cause tax changes.

Table V: Granger Causality Test

Dependent Variables → / Explanatory Variables ↓	$\Delta RGDP_t$		ΔT_t		ΔBottom 50%$_t$	
	F-stat	p-value	F-stat	p-value	F-stat	p-value
$\Delta RGDP_{t-1}$	4.23**	(0.04)	0.09	(0.75)	19.83***	(0.00)
ΔT_{t-1}	3.72*	(0.06)	0.95	(0.33)	0.64	(0.42)
ΔBottom 50%$_{t-1}$	3.38*	(0.07)	0.21	(0.64)	1.18	(0.28)

4. Variance Decomposition results presented in Table VI reinforce the implication that Romer and Romer's (2010) tax changes are largely exogenous. 99.4 percent of the ten-step-ahead variance in tax changes is explained by its own innovations.

Table VI: Variance Decompositions

	$\Delta RGDP$	ΔT	ΔBottom 50%
$\Delta RGDP$	78.30	17.56	4.13
ΔT	0.31	99.40	0.28
ΔBottom 50%	25.87	10.47	63.65