The Heterogeneous Effects of Government Spending: It's All About Taxes

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These views are those of the authors and not necessarily those of the Board of Governors or the Federal Reserve System.

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  - Distortionary taxes lead to even smaller output expansion
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    (Baxter & King, 1993), (Uhlig, 2010)
- Recent work: **HANK** models
  (Bilbiie, 2019), (Auclert, Rognlie, & Straub, 2018), (Hagedorn, Manovski, & Mitman, 2019)
  - Distribution of *mpc*

What we do

This paper: Revisit this question, taking into account **tax distribution**

- **Who pays** taxes to finance spending?
- Does it matter for the **aggregate effects** of spending?
- *Key idea*: Heterogeneous households respond differently to tax changes

What we find

Spending is **more expansionary** when financed with **more progressive** taxes

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  - U.S. tax progressivity from 1913 to 2012
  - Spending shocks lead to an increase in tax progressivity
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- An **empirical** result
  - U.S. tax progressivity from 1913 to 2012
  - Spending shocks lead to an increase in tax progressivity
  - Larger spending multipliers in periods of higher progressivity
- A **model** with heterogeneous agents can account for this fact
  - Indivisible labor supply $\rightarrow$ elasticities decline with income
  - Lower *mpc* for wealthier households
  - Higher taxes on richer households imply a smaller crowding-out

Outline

1) Evidence
2) Model
3) Multipliers and tax progressivity

A tax progressivity measure

Non-linear income tax: $\tau(y) = 1 - \lambda y^{-\gamma}$ ▸ More

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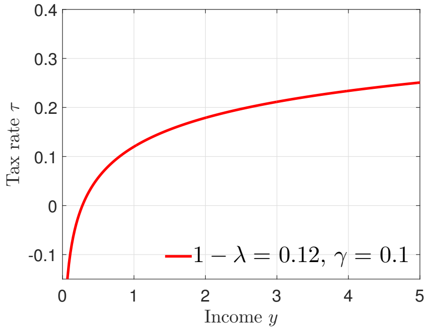

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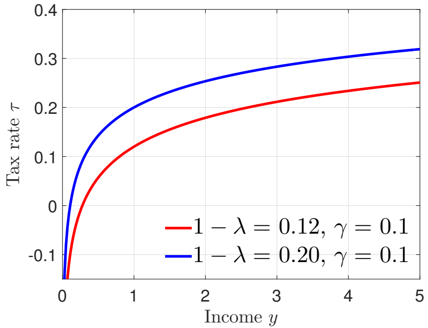

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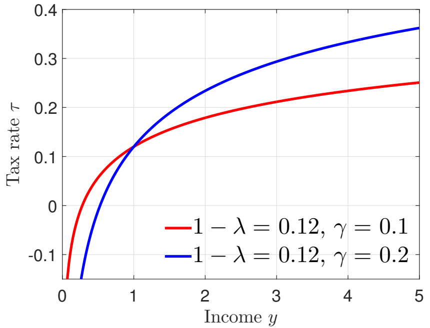

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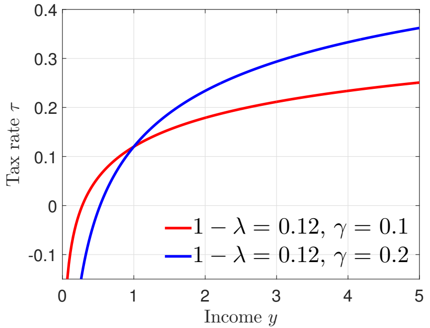


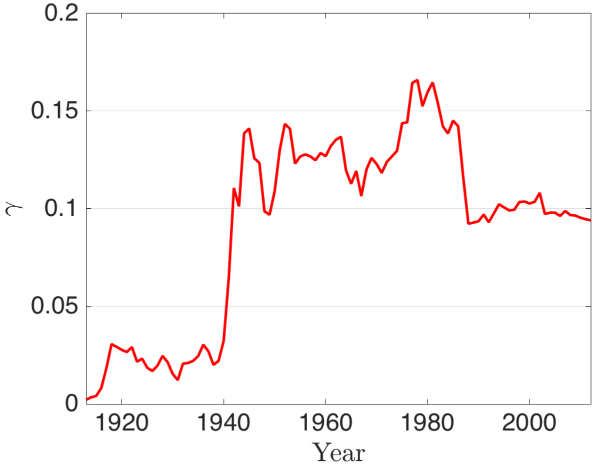
+ Compute γ for 1913-2012 as

$$\gamma = \frac{AMTR - ATR}{1 - ATR}$$

$AMTR$ = average marginal tax rate,
ATR = average tax rate

▸ More ▸ Spending

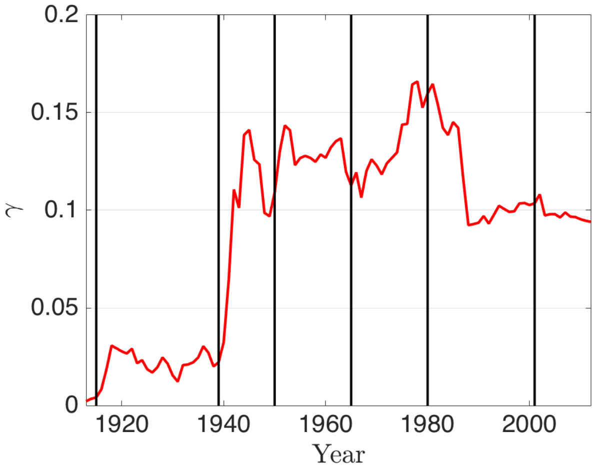
A century of U.S. tax progressivity



+ Substantial variation of γ during 20th century

A century of U.S. tax progressivity

More



Notes: Vertical lines correspond to major military events: 1914:q3 (WWI), 1939:q3 (WWII), 1950:q3 (Korean War), 1965:q1 (Vietnam War), 1980:q1 (Soviet Invasion to Afghanistan), 2001:q3 (9/11).

- Substantial variation of γ during 20th century
- Changes in γ often associated with military events

Average multipliers: local projection

- **Linear case:** Jorda (2005)

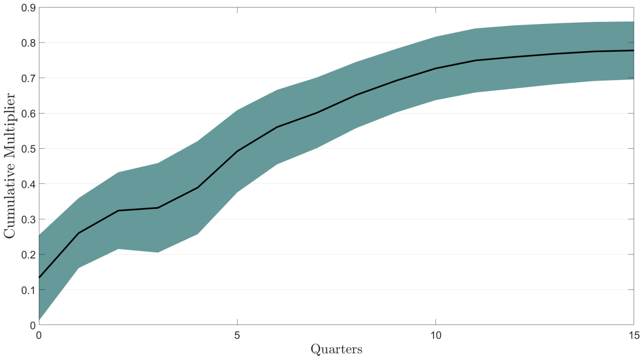
$$\sum_{j=0}^{h} y_{t+j} = A_h Z_{t-1} + m_h \sum_{j=0}^{h} g_{t+j} + \text{trend} + \varepsilon_{t+h}$$

  - where $y_{t+j} = \frac{Y_{t+j} - Y_{t-1}}{Y_{t-1}}$ and $g_{t+j} = \frac{G_{t+j} - G_{t-1}}{Y_{t-1}}$
  - Control Z_t contains lags of: Y_t, G_t, and AMTR
  - Instrument $\sum_{j=0}^{h} g_{t+h}$ with Ramey-Zubairy and Blanchard-Perotti shocks

- **Cumulative multiplier** m_h at horizon h

- Estimate response in **change in taxes** ▸ more

Effects of Government Spending: Linear Case



- Average spending multiplier ≈ 0.8 after three years

Effects of Government Spending: Linear Case

- Average spending multiplier ≈ 0.8 after three years
- Average shock associated with an increase in taxes and its progressivity

Progressivity-Dependent multipliers: local projection

- **Progressivity-dependent case:** Ramey and Zubairy (2016)

$$\sum_{j=0}^{h} y_{t+j} = \mathbb{I}\left(p_t = \mathrm{P}\right)\left\{A_{h,P} Z_{t-1} + m_{h,P} \sum_{j=0}^{h} g_{t+j}\right\}$$

$$+\, \mathbb{I}\left(p_t = \mathrm{N}\right)\left\{A_{h,R} Z_{t-1} + m_{h,N} \sum_{j=0}^{h} g_{t+j}\right\} + \text{trend} + \varepsilon_{t+h}$$

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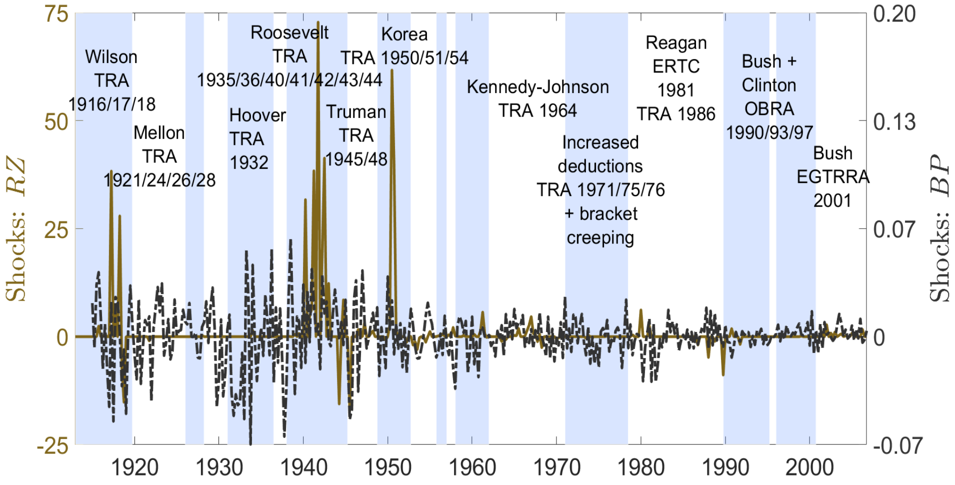
- Progressive ($p_t = P$) if γ is higher on average during next 3 years
  - Cumulative multiplier $m_{h,P}$, $m_{h,N}$
- Instruments for spending:
  - Ramey-Zubairy and Blanchard-Perotti shocks

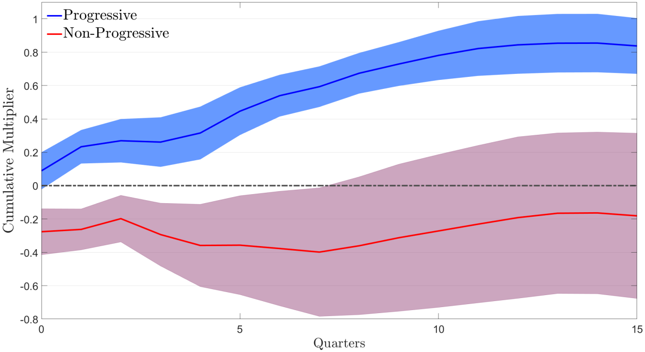
Progressivity Selection: in line with a narrative approach

More



Notes: Spending shocks (left axis: Ramey; right axis: Blanchard Perotti) and states (shaded areas represent periods of more progressive taxes).

Effects of Government Spending: Progressivity-Dependent multipliers



- Multiplier ≈ 1 for progressive taxes . . .
- . . . and ≈ 0 otherwise

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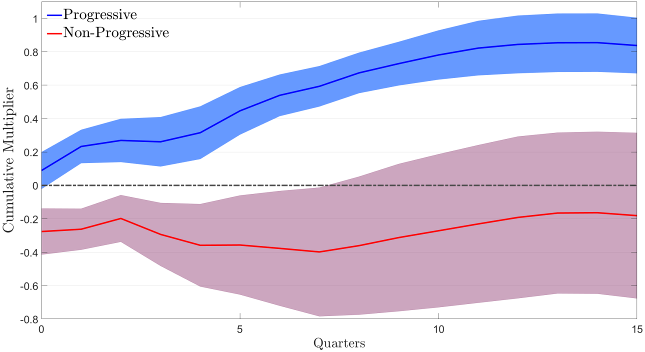

- Multiplier ≈ 1 for progressive taxes . . .
- . . . and ≈ 0 otherwise
- A robust fining
  - $\rightarrow$ *RZ* or *BP* as instrument
  - $\rightarrow$ Not due to path of deficits
  - $\rightarrow$ Expansion vs slack

Evidence: Main Takeaways

1) Average spending shock
   + leads to an output expansion
   + induces an increase in tax progressivity

2) Spending is more expansionary when financed with more progressive taxes

Model

HANK with indivisible labor

+ A continuum of **households**
  - Bond economy with borrowing constraint
  - Indivisible labor choice + idiosyncratic labor productivity shock
  - Permanent diferences in discount factors β

+ **Firms** final-good, and intermediate-goods
  - Production using labor + monopolistic competition
  - Quadratic cost of adjusting prices (Rotemberg, 1982)

+ **Government**: fiscal and monetary authorities
  - Fiscal: spends G_t financed with debt and taxes
  - Monetary: policy rate set by a Taylor rule

Households

The value function of an household with productivity x and assets a is:

$$V_t\left(a, x, \beta\right) \quad = \quad \max_{c, a', h} \left\{\log c - Dh + \beta \mathbb{E}_{x'}\left[V_{t+1}\left(a', x', \beta\right) | x\right]\right\}$$

subject to

$$\begin{aligned} c + a' \quad &\leq \quad w_t x h + (1 + r_t) a - \tau_{kt} r_t a - \tau_t \left(w_t x h\right) + T_t + \delta_t(x) \\ h \quad &\in \quad \{0, \bar{h}\}, \qquad a' \geq 0 \end{aligned}$$

Tax progressivity will be captured by the shape of $\tau_t(y) = 1 - \lambda_t y^{-\gamma_t}$.

Dividend payments $\delta_t(x) = \bar{\delta}_t x$ (Farhi & Werning 2019)

Productivity follows an AR(1) process: $\log(x_{i,t+1}) = \rho_x \log(x_{i,t}) + \sigma_x \epsilon_{i,t+1}$.

Government and Firms

- **Government**
  - Budget: $G_t + (1 + r_t)B_t + T_t = \int \{\tau_{kt} r_t a + \tau_t (w_t x h)\} d\mu_t(a, x) + B_{t+1}$
  - Taylor rule: $\ln (1 + i_t) = \rho + \phi_\Pi \ln (\Pi_t / \bar{\Pi})$

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  - Taylor rule: $\ln(1+i_t) = \rho + \phi_\Pi \ln(\Pi_t / \bar{\Pi})$

+ **Firms:** final-good, and intermediate-goods + monopolistic competition
  - Final-good: $y_t = \left(\int y_{jt}^{\frac{\epsilon-1}{\epsilon}}\right)^{\frac{\epsilon}{\epsilon-1}}$, Intermediate-good: $y_{jt} = z n_{jt}$
  - Quadratic adjustment cost in prices: $\frac{\Theta}{2}\left(\frac{P_{jt}}{P_{jt-1}} - \bar{\Pi}\right)^2 Y_t$
  - Phillips curve

$$\left(\Pi_t - \bar{\Pi}\right)\Pi_t + \frac{\epsilon-1}{\Theta} = \frac{\epsilon}{\Theta} w_t + \frac{1}{1+r_{t+1}}\left(\Pi_{t+1} - \bar{\Pi}\right)\Pi_{t+1}\frac{Y_{t+1}}{Y_t}$$

Calibration

- Technology: $\epsilon = 7$, $\Theta = 200$ (Galí & Gertler, 1999)
- Government:
  - Capital tax $\tau_k = 35\%$ (Chen, *et al.*, 2009) & Progressive labor tax $\gamma = 0.1$ (Heathcote, *et al.* 2013)
  - Spending $G/Y = 15\%$, Transfers $T/Y = 5\%$, Debt $D/Y = 2.4$
  - Taylor rule: $\bar{\Pi} = 1$, and $\phi_{\Pi} = 1.5$
- Household
  - $\beta \in \{\beta_L, \beta_H\}$, fraction $\pi_L^{\beta} \Rightarrow r = 2\%$ and average $mpc \approx 0.15$ (Kaplan, *et al.* 2018)
  - Disutility $D \Rightarrow$ employment $\approx 75\%$
  - Productivity $(\rho_x, \sigma_x) = (0.989, 0.287)$ (Chang *et al.* 2013)

Distributions

Calibration key objects: *lpe* and *mpc*

details

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+ Labor participation elasticities (*lpe*) decline with income

quintile	1	2	3	4	5	Average
lpe	0.51	0.66	0.35	0.21	0.16	0.38

Table: Participation elasticity wrt after-tax labor income

- Av. $\varepsilon < 1$ (Chetty and al., 2011)
- Range from 0.8 to 0 (Kleven & Kreiner, 2006) (Eissa & Liebman, 1996), (Meghir & Phillips, 2010), (Triest, 1990)

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+ Marginal propensities to consume (*mpc*) decline with wealth

quintile	1	2	3	4	5	Average
mpc	0.51	0.10	0.09	0.05	0.04	0.16

Table: propensity to consume out of $500

- Av *mpc* $\approx [0.15,\ 0.25]$ (Johnson, Parker & Souleles, 2011) (Kaplan & Violante, 2014) (Kaplan, Moll, & Violante, 2018)
- Range from 0.50 to 0 (Misra & Surico, 2011) (Crawley & Kuchler, 2018)

Insightful Experiment: A Tax Shock

+ A 1% labor-tax increase, returns (quickly) at rate $\rho = 0.5$
+ Labor and consumption responses by income-groups

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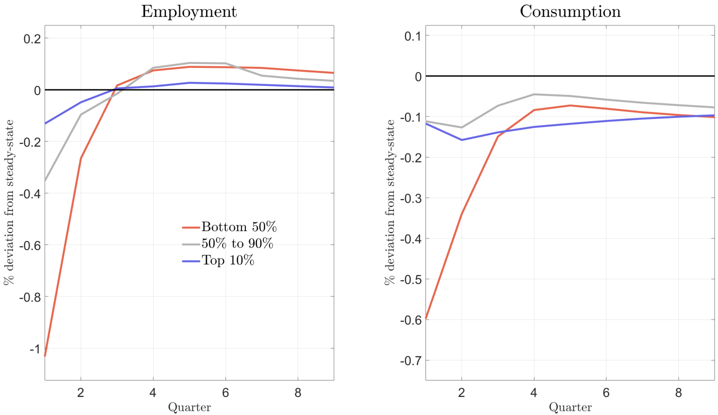


- A 1% labor-tax increase, returns (quickly) at rate $\rho = 0.5$
- Labor and consumption responses by income-groups
- Larger crowding-out at the bottom

Model Evaluation
Effects of Government Spending: It's All About Taxes

Multipliers and Progressivity: Model Experiment

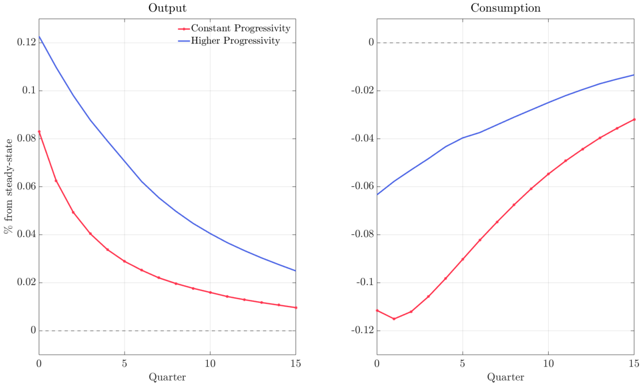
+ At $t = 0$, G increases by 1% and returns to steady-state at rate $\rho_G = 0.9$

+ Financed with *labor taxes*
  - Progressivty-dependent: $\gamma_t - \gamma = \phi(G_t - G)$

  1) Constant progressivity: $\phi = 0 \rightarrow$ all households face higher taxes
  2) Higher progressivity: $\phi > 0 \rightarrow$ income top-25% of households face higher taxes

+ Financed with *fiscal deficits*: estimated response of fiscal deficits

Multipliers are larger with more progressive taxes



+ Spending is more expansionary under progressive taxes

+ crowding-out is reduced

more

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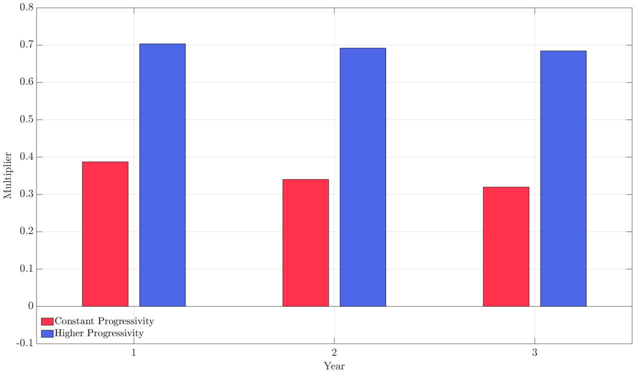


- Spending is more expansionary under progressive taxes
- crowding-out is reduced
- Cumulative multipliers more than doubles after three years

▸ more

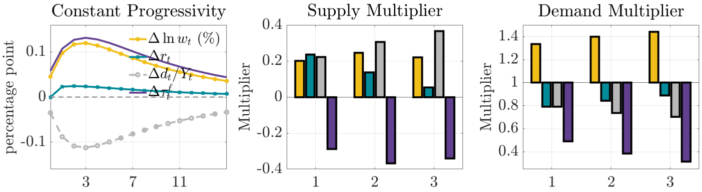
Direct and indirect effect: It's all about Taxes

- Responses depend on sequences of prices, taxes, and dividends:

$$\{w_{t+j}, r_{t+j}, d_{t+j}, \tau_{t+j}\}_{j\geq 0}$$

- Effect of feeding on sequence at a time: *supply* and *demand*
  - *Supply* multiplier $Y_t^s = L_t\left(\{w_{t+j}, r_{t+j}, d_{t+j}, \tau_{t+j}\}_{j\geq 0}\right)$
  - *Demand* multiplier $Y_t^d = C_t\left(\{w_{t+j}, r_{t+j}, d_{t+j}, \tau_{t+j}\}_{j\geq 0}\right) + G_t$

Direct and indirect effect: It's all about Taxes



- *Constant progressivity*
  - **Wages** increase labor and consumption ...
  - ... **Taxes** decreases them

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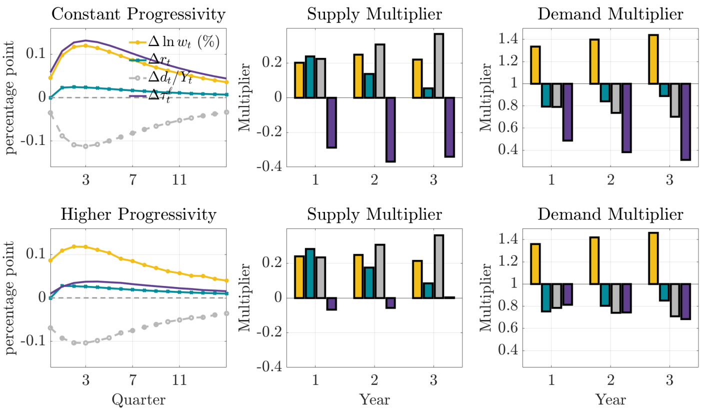

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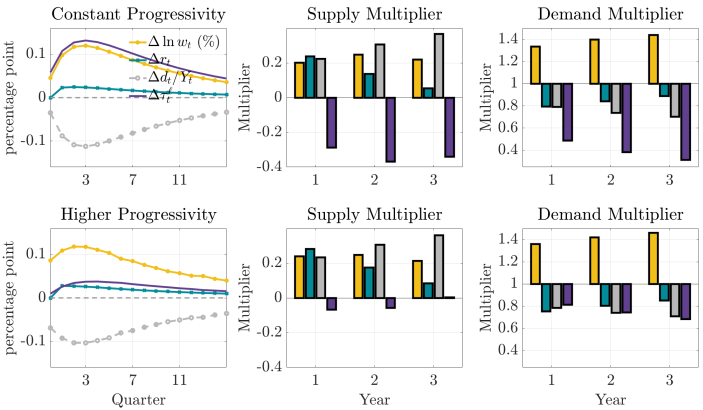
- *Higher progressivity*
  - {**Wages**, **rate**, **div**} same effect
  - **Taxes** effect minimized

Direct and indirect effect: It's all about Taxes



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  - **Taxes** effect minimized
- Differences in multipliers comes from taxes

lpe and *mpc*: both matters

+ Two alternative calibrations: "flatter *lpe*" and "lower *mpc*"

lpe and *mpc*: both matters

- "flatter *lpe*": Disutility $D \sim \text{Gumbel}(\bar{D}, \sigma_D^2)$. Increase σ_D^2

	lpe (income quintile)				
Benchmark	0.51	0.66	0.35	0.21	0.16
Flatter *lpe*	0.40	0.33	0.33	0.19	0.16

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Benchmark	0.51	0.66	0.35	0.21	0.16
Flatter *lpe*	0.40	0.33	0.33	0.19	0.16

- "lower *mpc*": homogeneous β

	mpc (wealth quintile)				
Benchmark	0.51	0.10	0.09	0.05	0.03
Lower *mpc*	0.10	0.09	0.07	0.05	0.04

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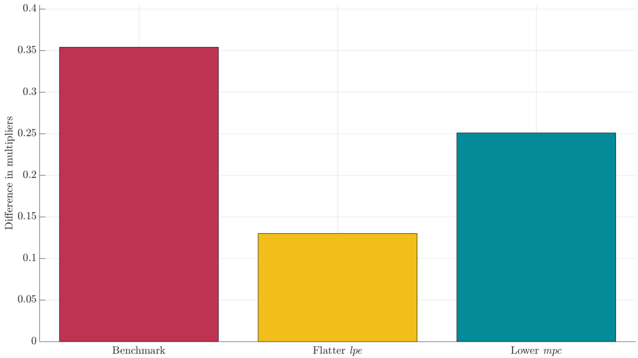

- Two alternative calibrations: "flatter *lpe*" and "lower *mpc*"
- Diff in multipliers ≈ 0.35 benchmark calib
- "flatter *lpe*" reduces diff in multipliers ≈ 0.13
- "lower *mpc*" reduces diff in multipliers ≈ 0.25

▸ Debt

Conclusions

- Tax progressivity is crucial to spending multipliers
  - **"Who pays"** matters! In the data, in the model
  - *Evidence*: spending shocks are
    - on average: expansionary, and induce an increase in tax progressivity
    - more expansionary in progressive episodes
  - *Model:* tax distribution shapes effects of spending
    - heterogeneity in *lpe* and *mpc* are key
- Future research
  - Progressivity as business cycle stabilizer? (McKay & Reis, 2020)
  - Optimal design of tax and transfers (Ferriere, Grübener, Navarro, Vardishvili, 2021)
  - Estimates of tax progressivity across time and space (Feenberg, Ferriere, Navarro, 2018)

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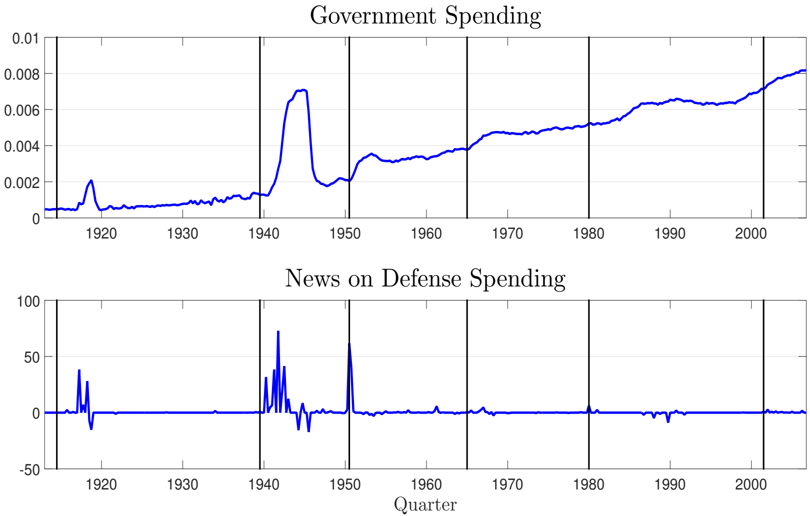
Thank you!!

Appendix

Government spending measures

Return



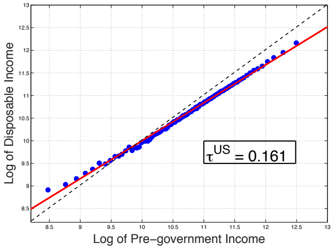
Notes: News variable is normalized by last quarter GDP. Source Ramey & Zubairy (2015). Vertical lines correspond to major military events.

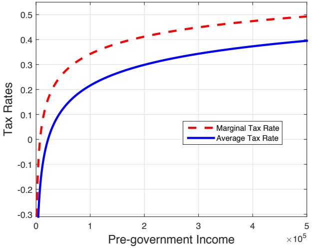
Heathcote Storesletten Violante (2016)

Return

Measurement of τ^{US}

- PSID 2000-06, age of head of hh 25-60, $N = 12,943$
- Pre gov. income: income minus deductions (medical expenses, state taxes, mortgage interest and charitable contributions)
- Post-gov income: ... minus taxes (TAXSIM) plus transfers





Tax progressivity estimate

▸ Return

- Tax function given by $\tau(y) = 1 - \lambda y^{-\gamma}$
- Total tax $T(y) = \tau(y)y$ and marginal tax $T'(y)$.

Tax progressivity estimate

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- Simple algebra

$$\gamma = \frac{T'(y) - \tau(y)}{1 - \tau(y)}$$

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- Total tax $T(y) = \tau(y)y$ and marginal tax $T'(y)$.
- Simple algebra

$$\gamma = \frac{T'(y) - \tau(y)}{1 - \tau(y)}$$

- $AMTR = \int T'(y)$ from Barro & Redlick (2011) and Mertens (2015)
- $ATR = \int \tau(y)$ our computations using IRS data and Piketty & Saez (2003)'s income measure.

Average tax response: local projection

- **Linear case:** Jorda (2005)

$$\tau_{t+h} - \tau_{t-1} = A_h Z_{t-1} + \beta_h \ln\left(\frac{G_{t+h}}{H_{t-1}}\right) + \text{trend} + \varepsilon_{t+h}$$

  - where τ_t = average tax rate
  - Control Z_t contains lags of: Y_t, G_t, and AMTR
  - Instrument $\ln\left(\frac{G_{t+h}}{G_{t-1}}\right)$ with Ramey-Zubairy and Blanchard-Perotti shocks

- **Tax response** β_h at horizon h

return

Households Distribution

Return

Quintiles	1st	2nd	3rd	4th	5th
Share of Wealth					
- *PSID Data*	−0.01	0.00	0.03	0.11	0.87
- *Model*	0.00	0.01	0.05	0.16	0.78
Participation Rate					
- *PSID Data*	0.65	0.75	0.69	0.60	0.57
- *Model*	0.78	0.63	0.58	0.53	0.48

Wealth corresponds to liquid wealth, computed from SCF 1983. Employment statistics are from PSID 1984 survey. The statistics of "primary households" are those for household heads whose education was 12 years and whose age is 18 or above.

Tax Events - WWI

Return Return

- Sixteen Amendment (1913) makes income taxation constitutional
- WWI: Tax Revenue Acts (TRA) of 1916, 1917 and 1918
  - Top marginal tax rates increased from 15% in 1913 to 73% in 1918
  - Increase was much steeper at the top of income distribution
    - Bottom marginal tax rates went from 2% to 4%.
  - By 1919, income taxes became an important component
    - About 15% of American households paid any income tax (Brownlee, 2016)
    - Income (corporate + individual) taxes represented 2/3 of federal tax revenues (about 11% of GDP)

Tax Events - WWII

Return Return

- Starting with TRA of 1932 (Hoover), top marginal tax rates increase almost every year during the 30s.
  - TRA 1932, 1934, 1936, 1938. Marginal tax rates at the top increase from 25% to $70-79\%$
- TRA of 1940, 1941, 1942, 1945 increases progressivity even further
  - TRA 1940 increases corporate income taxes from 19% to 33%
  - TRA 1941 and 1942 increases top marginal tax rates from $70-79\%$ to $85-94\%$.
  - Taxes at the bottom also increases, from 4% to 10% in 1941 and 10% to 20% in 1942

Tax Events - Korea (Truman)

Return Return

- TRA 1948: top marginal taxes decreased from $\sim$ 90% to $\sim$ 84%
- TRA 1950 & 1951: top marginal taxes returned to their WWII level
- Taxes at the bottom are virtually not affected.

Tax Events - Vietnam

▸ Return ▸ Return

- TRA 1964: decreased marginal tax rates
- TRA 1968: increases taxes again to cover the Vietnam War expenses.
  - Tax increase of 10% for everyone in 1968. Temporary, one-time change.
  - Again by 2.5% in 1969 and 1970.

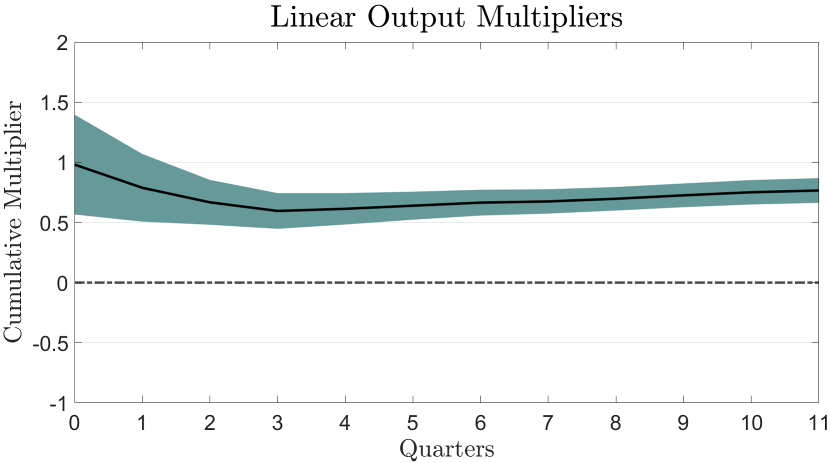
Tax Events - Reagan

Return Return

- Tax acts 1981 and 1986 reduce top marginal tax rate from 70% to 50% and then again to 35%.
- Elimination of brackets implies an increase in marginal tax rates at the bottom
- The change was meant to be revenue-neutral, and is the beginning of years of deficits.

Multipliers with *RZ* only – linear & across states

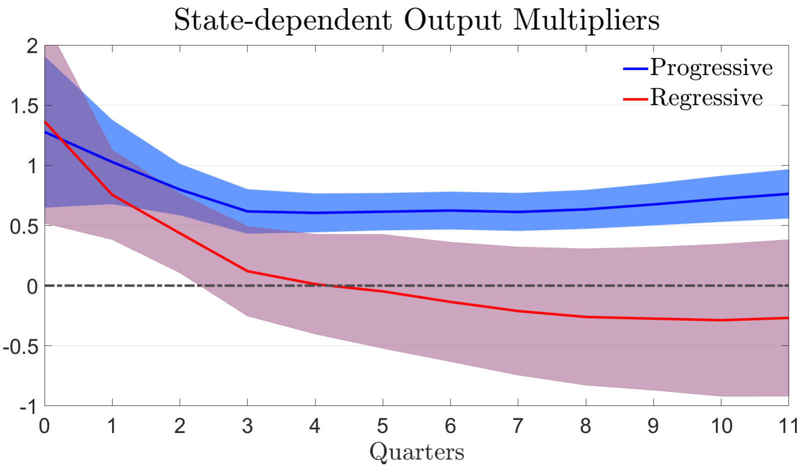
Return



Notes: Local projection; data 1913-2006; confidence intervals: 68%; window: 12 quarters.

Multipliers with *RZ* only – linear & across states

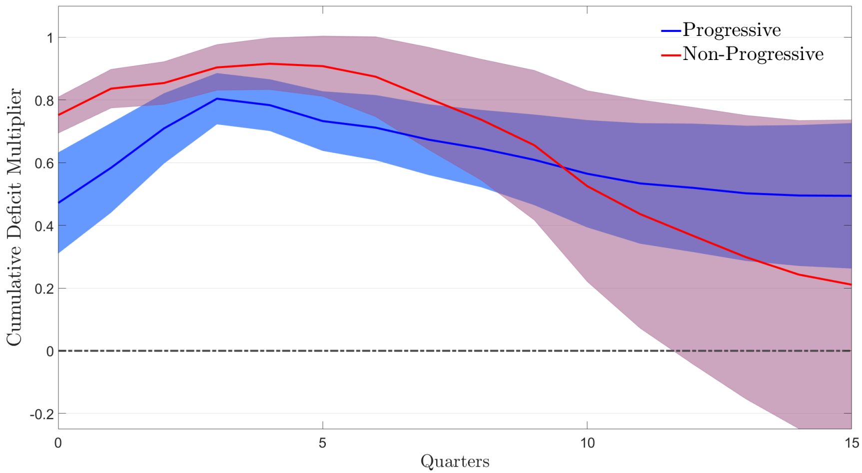
▸ Return



Notes: Local projection; data 1913-2006; confidence intervals: 68%; window: 12 quarters.

Deficit Multipliers across states

Return



Notes: Local projection; data 1913-2006; confidence intervals: 68%; window: 12 quarters.

Deficit Multipliers computation

Return

- **Deficit Multipliers:** similar as before

$$\sum_{j=0}^{h} d_{t+j} = \mathbb{I}(s_t = \mathrm{P}) \left\{ A_{h,P} Z_{t-1} + m^d_{h,P} \sum_{j=0}^{h} g_{t+j} \right\}$$

$$+ \mathbb{I}(s_t = \mathrm{R}) \left\{ A_{h,R} Z_{t-1} + m^d_{h,R} \sum_{j=0}^{h} g_{t+j} \right\} + \text{trend} + \varepsilon_{t+h}$$

  - where $d_{t+j} = \frac{D_{t+j} - D_{t-1}}{Y_{t-1}}$ and D_t is fiscal deficit
  - Same controls Z_t as before

- m^d_h measures deficits response to a \$1 increase in spending

LPM Robustness

Return

	1-year integral			2-year integral			3-year integral		
	PR	RE.	p	PR	RE.	p	PR	RE.	p
Slack									
- expansion	0.35	-0.86	0.00	0.63	-0.66	0.01	0.86	-0.63	0.07
	(0.12)	(0.32)		(0.16)	(0.56)		(0.24)	(0.97)	
- slack	0.49	1.82	0.16	0.58	-5.81	0.18	0.82	-6.30	0.16
	(0.19)	(0.94)		(0.22)	(4.41)		(0.21)	(5.04)	
Period									
- 53:q1-06:q4	2.08	0.25	0.04	2.95	0.33	0.00	2.93	0.90	0.00
	(0.68)	(0.54)		(0.74)	(0.42)		(0.62)	(0.39)	
- 13:q1-12:q4	0.26	-0.30	0.01	0.59	-0.36	0.00	0.82	-0.22	0.00
	(0.15)	(0.19)		(0.12)	(0.38)		(0.16)	(0.46)	

Government and Supply side

+ **Government**
  - Budget: $G_t + (1 + r_t)B_t + T_t = \int \{\tau_{kt} r_t a + \tau_t (w_t x h)\} \, d\mu_t(a, x)$
  - Taylor rule: $\ln (1 + i_t) = \rho + \phi_\Pi \ln \left(\Pi_t / \bar{\Pi}\right)$

+ **Supply** side
  - Linear technology: $y = z n_{jt}$
  - Quadratic adjustment cost in prices: $\frac{\Theta}{2} \left(\frac{P_{jt}}{P_{jt-1}} - \bar{\Pi} \right)^2 Y_t$
  - Phillips curve: $\left(\Pi_t - \bar{\Pi}\right) \Pi_t + \frac{\epsilon - 1}{\Theta} = \frac{\epsilon}{\Theta} w_t + \left(\Pi_{t+1} - \bar{\Pi}\right) \Pi_{t+1} \frac{Y_{t+1}}{Y_t}$

return

Government and Firms

+ **Government**
  - Budget: $G_t + (1 + r_t)B_t + T_t = \int \{\tau_{kt} r_t a + \tau_t (w_t x h)\} \, d\mu_t(a, x)$
  - Taylor rule: $\ln (1 + i_t) = \rho + \phi_\Pi \ln (\Pi_t / \bar{\Pi})$

+ **Firms:** final-good, and monopolistic intermediate-goods producers
  - final-good: $y_t = (\int y_{jt}^{\frac{\epsilon-1}{\epsilon}})^{\frac{\epsilon}{\epsilon-1}}$, intermediate-good: $y_{jt} = z n_{jt}$
  - Quadratic adjustment cost in prices: $\frac{\Theta}{2} \left(\frac{P_{jt}}{P_{jt-1}} - \bar{\Pi} \right)^2 Y_t$
  - Phillips curve

$$\left(\Pi_t - \bar{\Pi}\right) \Pi_t + \frac{\epsilon - 1}{\Theta} = \frac{\epsilon}{\Theta} w_t + \frac{1}{1 + r_{t+1}} \left(\Pi_{t+1} - \bar{\Pi}\right) \Pi_{t+1} \frac{Y_{t+1}}{Y_t}$$

Computing *lpe* and *mpc* in the model

Return

- Simulate a panel, annual frequency, and estimate *lpe* as b_1 (Rogerson and Wallenius, 2009)

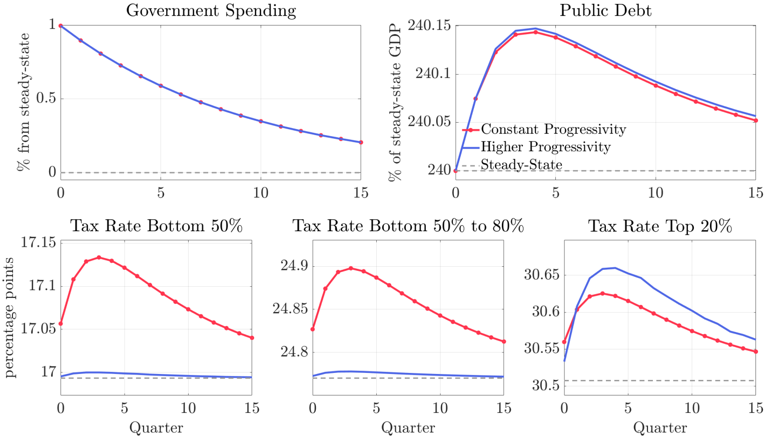
$$\ln h_{in} = b_0 + b_1 \ln \tilde{w}_{in} - b_2 \ln c_{in} + \epsilon_{in}$$

h_{in} = hours worked, $\tilde{w}_{in}$ = after tax wage, c_{in} = consumption (all annual)

- *mpc* computed from consumption change to a \$500 rebate.

Model Experiment: debt and taxes

Return



lpe and *mpc*: both matters

Return

+ "Flatter *lpe*" calibration: preference shock w/ higher variance

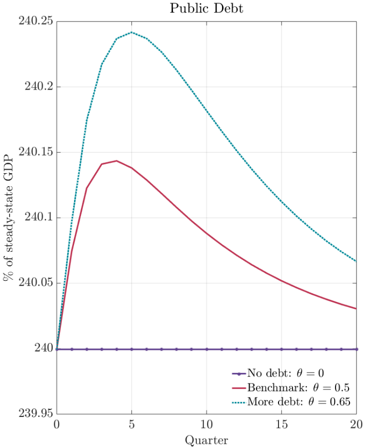
	lpe				
Income quintile	1	2	3	4	5
Benchmark	0.51	0.66	0.35	0.21	0.16
Flatter *lpe*	0.40	0.33	0.33	0.19	0.16

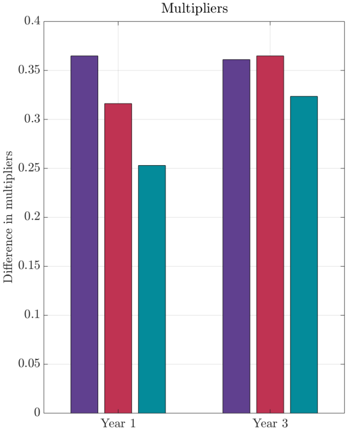
+ "Lower *mpc*" calibration: homogeneous β

	mpc				
Wealth quintile	1	2	3	4	5
Benchmark	0.51	0.10	0.09	0.05	0.03
Lower *mpc*	0.10	0.09	0.07	0.05	0.04

Model Experiment: debt and taxes

Return





- Progressive taxes always induce larger multipliers
- If no debt is used, progressive taxes produce even larger *gains* in multipliers

Elasticity of Taxable Income (in case Mark asks!)

- Elasticity of taxable income (ETI) is estimated to be large for top-1% (Saez, 2004)
- Response seems to be due to income-shifting without real economic effects.
- Using 1993 tax reform and executive compensations, (Goolsbee, 2000) finds
  - Short-run ETI > 1, but ETI ≈ 0 after a year.
  - High short-run ETI from exercise of stock options by the highest-income executives
  - ETI ≈ 0 for conventional taxable compensations (salary and bonuses)
- Saez, Slemrod, and Giertz (2012) conclude:
  "There is no compelling evidence to date of *real* responses of upper income taxpayers to changes in tax rates" (original italics).