

# Lecture 14: Empirical Macroeconomics

## Intermediate Macroeconomics, Econ 102

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# Outline

- 1 Aggregate Studies
- 2 Individual-Level Studies
- 3 Cross-Sectional Studies

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# The Problem with Empirical Macro



**Charlie Peters**  @CDP1882 · Sep 22

This week marks five years since Britney Spears released her anthem 'Work Bitch'

Since then, US unemployment has dropped from 7.2% to 3.9%



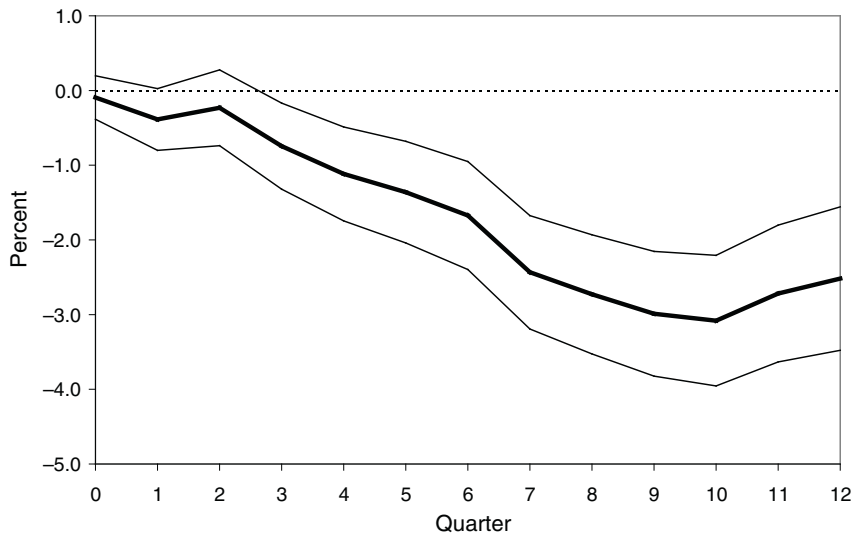
# The Problem with Empirical Macro

- Why don't we just look at what happens to GDP following a tax cut?
  - ① Many things happen in any one year.
    - ★ E.g. Britney Spears releases her new song, which increases people's work ethic ( $B$  of problem set 4, Exercise 2).
    - ★ What would the counterfactual have been?
  - ② Policies are changed for a reason.
    - ★ Years where taxes are changed are different from taxes where taxes are not changed.
    - ★ This is not like a Randomized Control Trial (RCT) in medicine: macroeconomic policies are not changed randomly.
    - ★ For example:  $\Delta G > 0$  often happens during recessions. Low subsequent GDP growth: low multipliers or because GDP growth was low to start with.
- Answers:
  - ① Add up many tax changes.
  - ② State their motivations. Taxes raised to reduce the deficit, or increase long-run incentives are “exogenous.”

# List of Tax Changes in Romer, Romer (2010) (Zidar (2018))

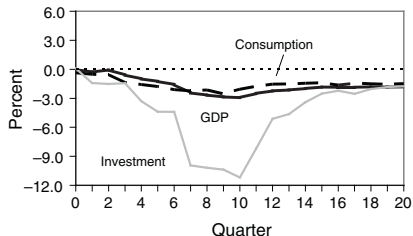
Legislation	Year	Motivation	Endogeneity	Size (% GDP)
Revenue Act of 1948	1948	Long run	Exogenous	-1.86
Social Security Amendments of 1947	1950	Deficit	Exogenous	0.26
Internal Revenue Code of 1954	1954	Long run	Exogenous	-0.37
Social Security Amendments of 1958	1960	Deficit	Exogenous	0.36
Social Security Amendments of 1961	1963	Deficit	Exogenous	0.86
Revenue Act of 1964	1964	Long run	Exogenous	-1.27
Social Security Amendment of 1967	1971	Deficit	Exogenous	-0.02
Revenue Act of 1971	1972	Long run	Exogenous	-0.73
Tax Reform Act of 1976	1976	Long run	Exogenous	0.13
Tax Reduction and Simplification Act 1977	1977	Long run	Endogenous	-0.38
1972 Changes to Social Security	1978	Deficit	Exogenous	0.13
Revenue Act of 1978	1979	Long run	Exogenous	-0.39
Social Security Amendment of 1977	1981	Long run	Exogenous	0.40
Economic Recovery Tax Act of 1981	1982	Long run	Exogenous	-1.33
Economic Recovery Tax Act of 1981	1983	Long run	Exogenous	-0.87
Social Security Amendments of 1983	1984	Deficit	Exogenous	-0.41
Social Security Amendments of 1983	1985	Deficit	Exogenous	0.21
Tax Reform Act of 1986	1986	Long run	Exogenous	0.60
Tax Reform Act of 1986	1987	Long run	Exogenous	-0.57
Social Security Amendments of 1983	1988	Deficit	Exogenous	0.37
Social Security Amendments of 1983	1990	Deficit	Exogenous	0.18
Omnibus Budget Reconciliation Act of 1990	1991	Deficit	Endogenous	0.00
Omnibus Budget Reconciliation Act of 1993	1993	Deficit	Exogenous	0.42
Omnibus Budget Reconciliation Act of 1993	1994	Deficit	Exogenous	0.19
Economic Growth and Tax Relief Reconciliation Act of 2001	2002	Long run	Exogenous	-0.77
Jobs and Growth Tax Relief Reconciliation Act of 2003	2003	Long run	Exogenous	-1.13
Jobs and Growth Tax Relief Reconciliation Act of 2003	2004	Long run	Endogenous	0.00
Jobs and Growth Tax Relief Reconciliation Act of 2003	2005	Long run	Exogenous	0.54

# 1% of GDP Tax Increase on GDP: Romer, Romer (2010)

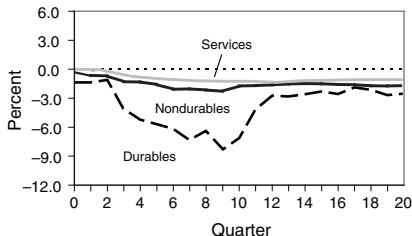


# 1% of GDP Tax Increase: Romer, Romer (2010)

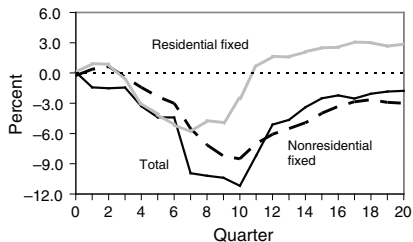
Panel A. GDP, consumption, investment



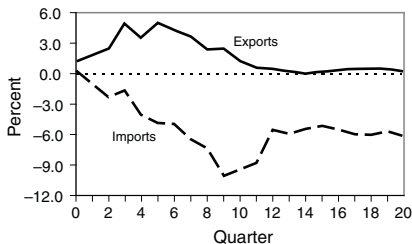
Panel B. Components of consumption



Panel C. Components of investment



Panel D. Exports and imports





# Advantages and Disadvantages

- Issues with these studies:
  - ▶ very noisy results: multiplier is between 2 and 4.
  - ▶ One cannot further decompose: e.g. Top 10 VS Bottom 90. We would get something even noisier.
  - ▶ Always worry that tax changes are endogenous. (at the aggregate level, taxes are changed for a reason)
- Advantages:
  - ▶ It is exactly the object of interest (national level multiplier).
  - ▶ Allows to tell apart different models.

- 1 Aggregate Studies
- 2 Individual-Level Studies
- 3 Cross-Sectional Studies

# Advantages and Disadvantages

- Using individual-level data like survey, fiscal, administrative, or account-level data to measure  $\epsilon$ , or  $c_1$ .
- Advantages:
  - ▶ Many more individuals: less noisy results (more observations).
  - ▶ More credible “identification”: comparing two people at the same time period.
- Disadvantages:
  - ▶ Keynesian, aggregate demand effects cannot be estimated.
  - ▶ e.g. if I decrease someone’s tax rate, then it might lead someone else to work more, not just the person who benefited from the fall in tax rates. (though the aggregate demand effect).
  - ▶ Thus, there is no clean “control” group if there are aggregate demand effects.

# Marginal Propensity to Consume

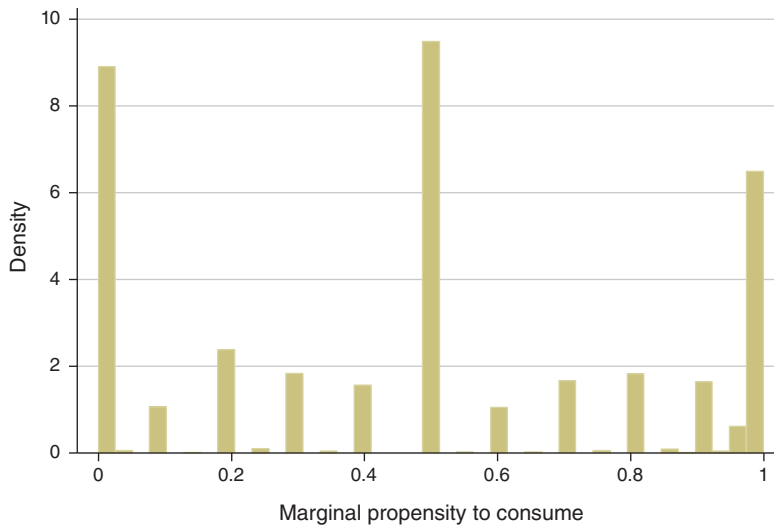


FIGURE 1. SELF-REPORTED MPC FROM TRANSITORY INCOME SHOCK

# Marginal Propensity to Consume

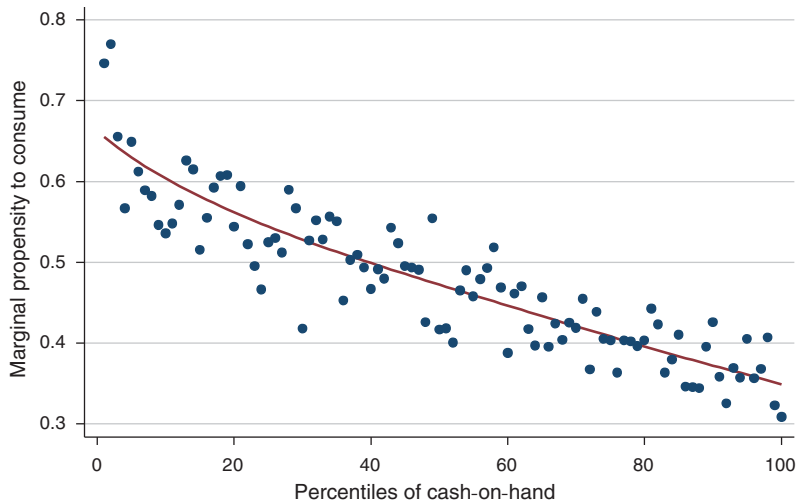


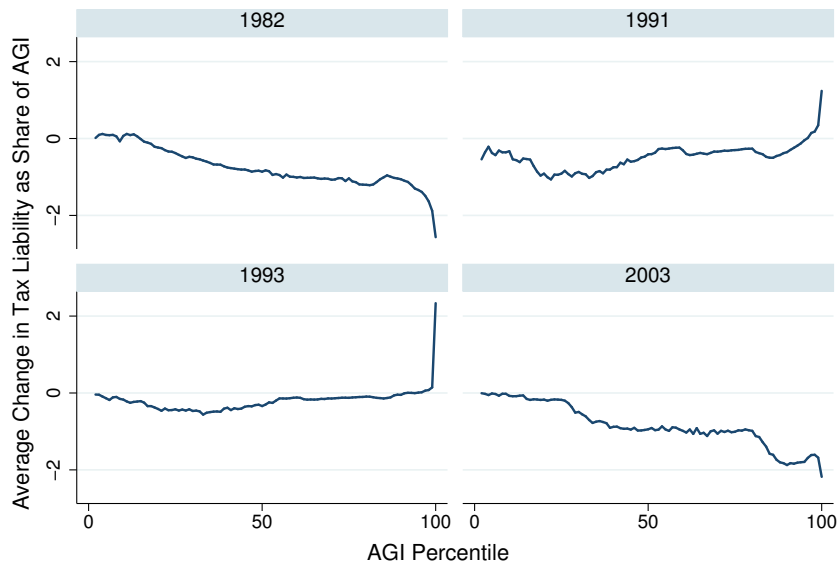
FIGURE 2. AVERAGE MPC BY CASH-ON-HAND PERCENTILES

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# Advantages and Disadvantages

- Identification across zipcodes, counties, or states.
- Advantages:
  - ▶ More observations.
  - ▶ Measure Keynesian, aggregate demand, general equilibrium effects.
  - ▶ Less endogenous changes than at the national level: aggregate taxes are not changed in the U.S. to target California's GDP specifically.
- Disadvantages:
  - ▶ Openness  $m_1$  of a state is larger, so multiplier is lower.
  - ▶ But we are interested in national level multipliers, not state level multipliers.
  - ▶ We thus need economic theory in order to infer national multipliers from state multipliers.

# Zidar (2018): Tax Cuts for Whom?

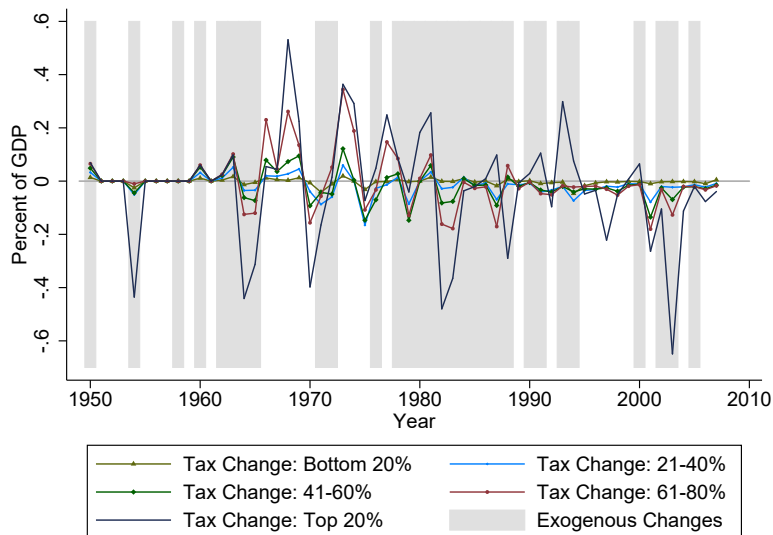


Graphs by Year



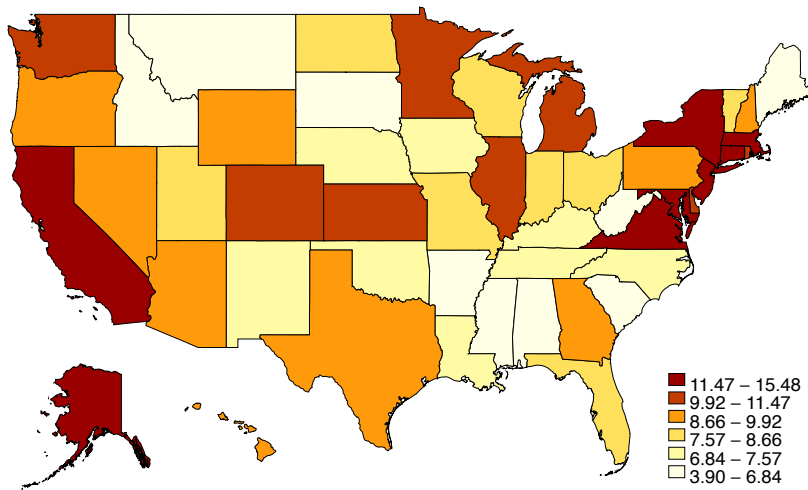
# Zidar (2018): Tax Cuts for Whom?

## A. Federal Income and Payroll Tax Changes by AGI Quintile



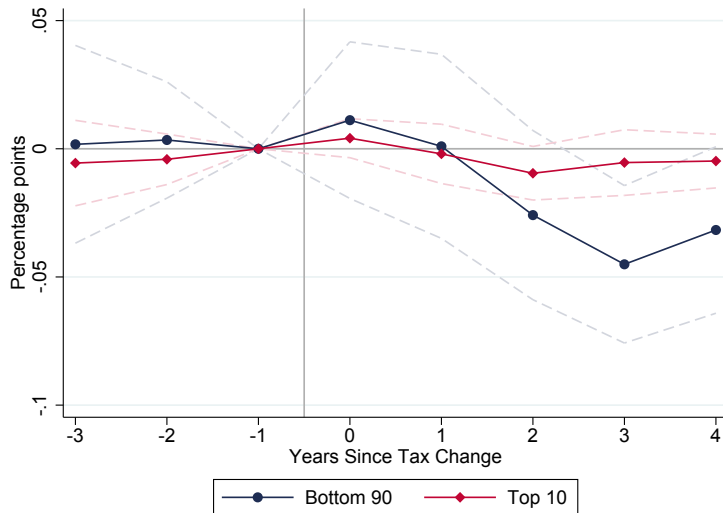
# Zidar (2018): Tax Cuts for Whom?

## B. Share of High-Income Taxpayers



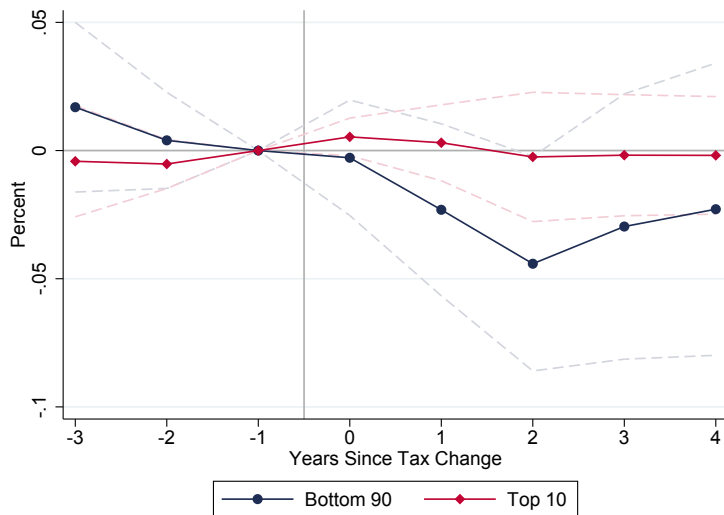
# Zidar (2018): Tax Cuts for Whom?

## A. Employment-to-Population Ratio

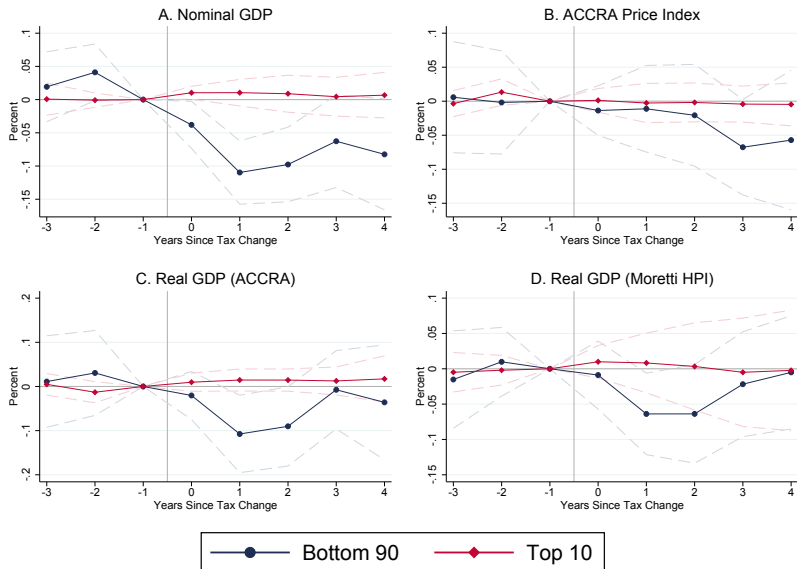


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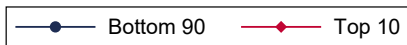
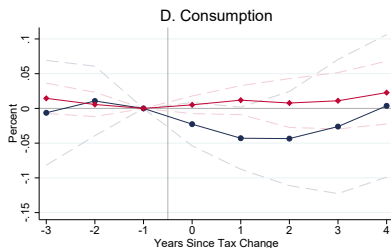
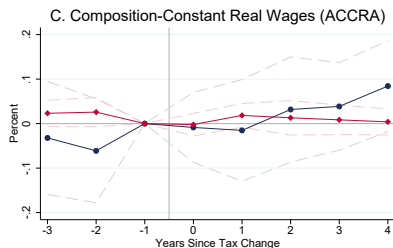
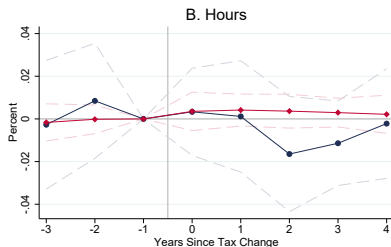
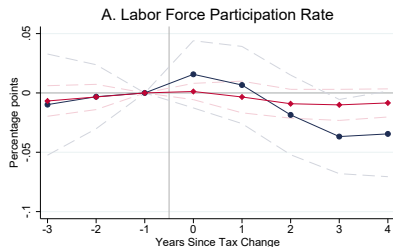
## B. Employment



# Zidar (2018): Tax Cuts for Whom?



# Zidar (2018): Tax Cuts for Whom?



## Zidar (2018) Results

- Using state-level variation in income distributions, Zidar (2018) in a forthcoming *Journal of Political Economy* paper estimates the following effects on GDP:
  - ▶ Multiplier effect of a tax cut to the bottom 90% is roughly 7.
  - ▶ Multiplier effect of a tax cut to the top 10% is roughly 0.
  - ▶ A tax cut going half to both groups has a multiplier of about 3.5 (Romer, Romer (2010) result).
- Results seem to confirm our results from Lecture 9: tax cuts on bottom 90% work better than on top 10%.
- Effects on employment are similar:
  - ▶ 1% of state GDP tax cut for the bottom 90% results in 3.4% employment growth over a 2-year period.
  - ▶ 1% of state GDP tax cut for the top 10% is 0.2% and statistically insignificant.