

## LECTURE 6

# The Effects of Fiscal Changes: Cross-Section Evidence



September 26, 2018

# Office Hours

- No office hours this Thursday (9/27).
- Office hours Monday (10/1) 4–5:30 and Thursday (10/4) 2–4.

# I. OVERVIEW OF STATE-BASED STUDIES OF THE IMPACT OF FISCAL CHANGES

How does monetary policy affect the  
fiscal multiplier?

# Open Economy Relative Multiplier

- Multiplier: Effect of  $G$  on  $Y$
- Relative: How relative  $G$  in a state or region affects relative  $Y$  or employment
- Open Economy: Are effects of spending in a state felt in the state?

# How does the open economy relative multiplier compare with the closed economy aggregate multiplier?

- Impact of monetary policy
- State spillovers
- Impact of Ricardian equivalence and crowding out

II. CHODOROW-REICH, FEIVESON, LISCOW, AND  
WOOLSTON, “DOES STATE FISCAL RELIEF DURING  
RECESSIONS INCREASE EMPLOYMENT? EVIDENCE FROM  
THE AMERICAN RECOVERY AND REINVESTMENT ACT”

## Experiment They Consider

- ARRA increased aid to states to pay for Medicaid (FMAP).
- Look at whether states that got more aid did better.
- Main outcome variable is employment by state.



# Omitted Variable Problem

- More troubled states got more state fiscal relief in ARRA.
- Solution: IV using 2007 state FMAP spending per person as instrument for ARRA FMAP increase.
- Idea is that some states got more ARRA FMAP funds just because they had more generous systems before the recession.

## C-R,F,L,W Specification

$$(1) \quad \frac{E_1^s - E_0^s}{N^s} = \beta_0 + \beta_1 \frac{Aid^s}{N^s} + \beta_2 Controls^s + \varepsilon^s$$

Where:

- $E^s$  is employment in state  $s$
- $N^s$  is the population aged 16+ in state  $s$
- $AID^s$  is state fiscal relief received by state  $s$
- Controls are state- and region-specific variables

# Instrument

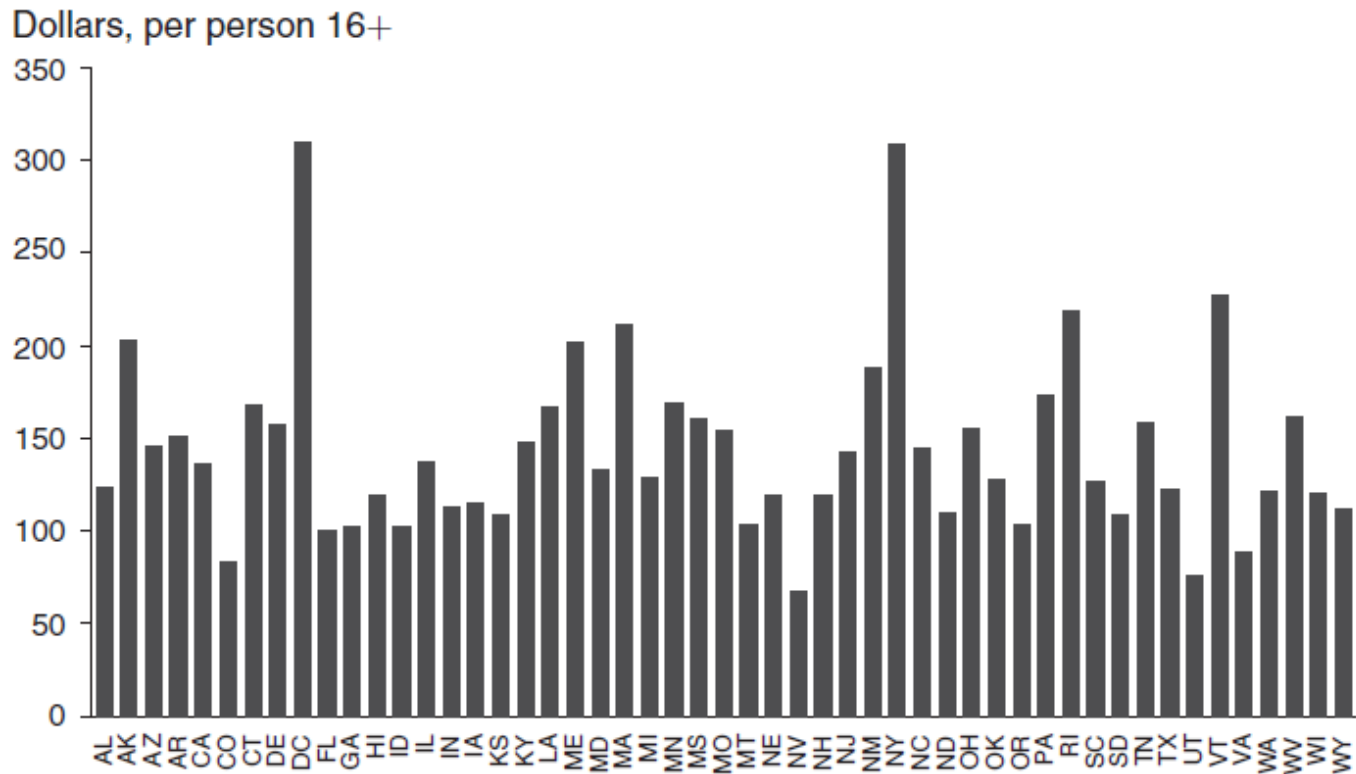


FIGURE 1. VALUE OF THE SCALED INSTRUMENT

*Notes:* The value of the scaled instrument is  $0.062 \times \text{state's fiscal year 2007 Medicaid spending} \times 21/12$ . See text for full details. Data are from the Center for Medicaid Services, data compendium, table VII.1.

From: Chodorow-Reich, Feiveson, Liscow, and Woolston

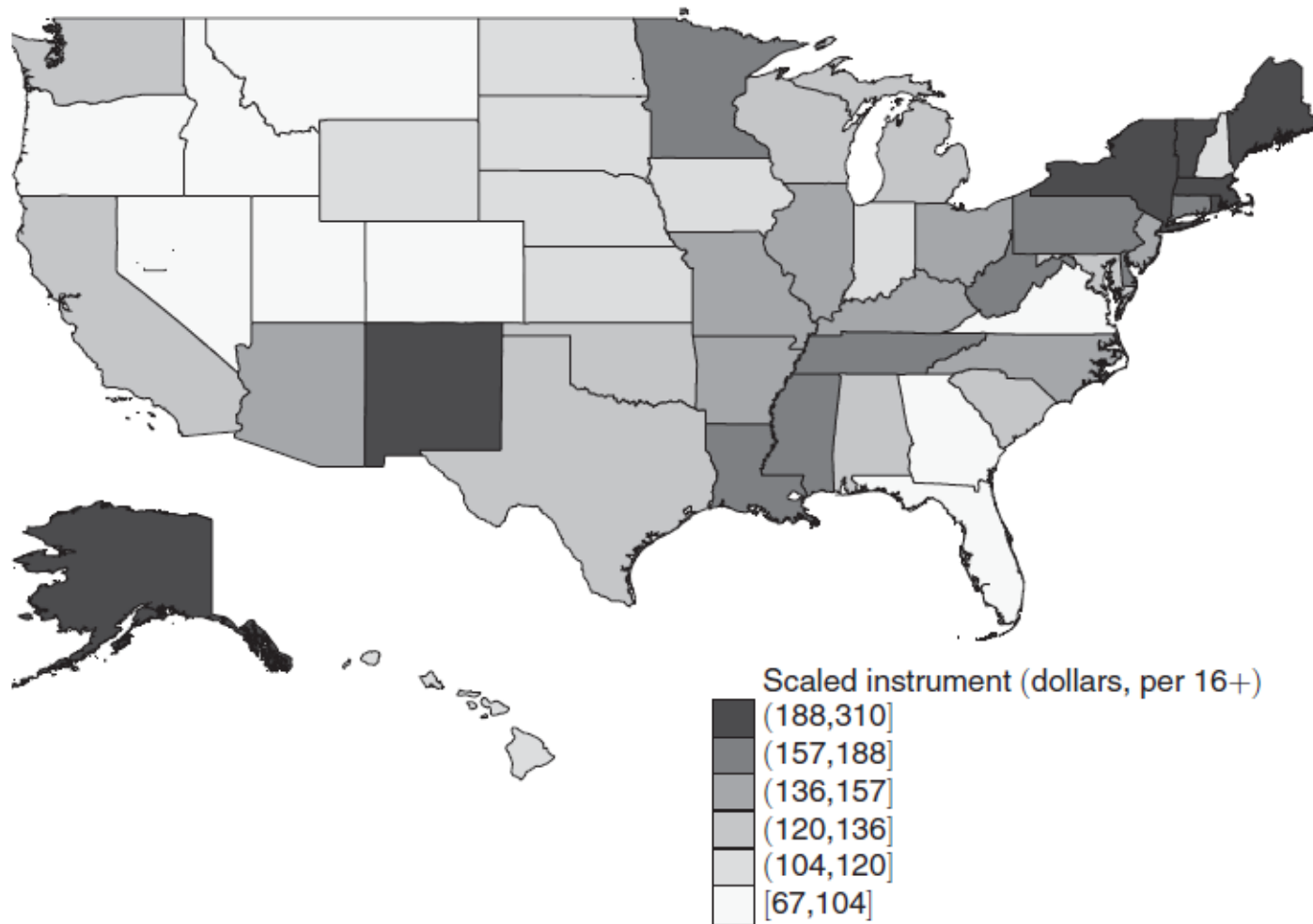


FIGURE 2. VALUE OF THE SCALED INSTRUMENT

From: Chodorow-Reich, Feiveson, Liscow, and Woolston

## Control Variables

- Region dummies
- Employment in manufacturing
- Lagged state employment
- Union share and Kerry vote share

TABLE 2—FIRST STAGE REGRESSIONS

	(1)	(2)	(3)	(4)
2007 Medicaid spending (instrument)	0.18*** (0.01)	0.15*** (0.01)	0.16*** (0.01)	0.15*** (0.01)
Region fixed effects?		X	X	X
Vote share Kerry (2004)		X	X	X
Union share		X	X	X
GDP per person 16+		X	X	X
Employment in manufacturing		X	X	X
State population		X	X	X
Lagged total employment change May 2008 to Dec 2008			X	
Lagged government, health, and education employment change May 2008 to Dec 2008				X
Observations	51	51	51	51
$R^2$	0.84	0.93	0.93	0.93
Mean of dependent variable	250.23	250.23	250.23	250.23

*Notes:* The outcome variable for each regression is total FMAP outlays per individual 16+ in a state, through June 30, 2010. The variable is measured in \$100,000 per person 16+. See text and Appendix for sources. Note that “government” excludes federal government employees. Robust standard errors are in parentheses.

\*\*\* Significant at the 1 percent level.

\*\* Significant at the 5 percent level.

\* Significant at the 10 percent level.

From: Chodorow-Reich, Feiveson, Liscow, and Woolston

TABLE 3—TOTAL EMPLOYMENT BASELINE RESULTS

	OLS			IV		
	(1)	(2)	(3)	(4)	(5)	(6)
Total FMAP payout per person 16+ (\$100,000)	2.94** (1.35)	1.88 (1.83)	0.82 (1.06)	4.72*** (1.31)	4.61*** (1.57)	2.83*** (1.01)
Vote share Kerry (2004), percent/10,000		0.28 (2.02)	2.1 (1.57)		−0.79 (1.59)	1.14 (1.14)
Union share, percent/10,000		−4.26 (3.60)	−2.93 (2.17)		−6.00** (2.91)	−4.29** (2.01)
GDP per person 16+ (\$1,000,000)		0.01 (0.07)	−0.03 (0.06)		−0.01 (0.06)	−0.04 (0.05)
Employment in manufacturing, percent/10,000		−10.05*** (3.05)	−6.61*** (2.39)		−9.75*** (2.82)	−6.83*** (2.12)
State population 16+, billions		−0.43*** (0.12)	−0.33*** (0.08)		−0.46*** (0.10)	−0.36*** (0.08)
Lagged total employment change May to Dec 2008			0.42* (0.21)			0.37** (0.17)
Region fixed effects?		X	X		X	X
Observations	51	51	51	51	51	51
Mean of dep. var. × 1,000	−18.76	−18.76	−18.76	−18.76	−18.76	−18.76

*Notes:* The outcome variable for each regression is the seasonally adjusted change in total nonfarm employment per individual 16+ in a state, from December 2008 to July 2009. The main variable of interest is total ARRA FMAP payouts through June 30, 2010. Specifications 4–6 instrument total ARRA FMAP payouts with pre-recession Medicaid spending as described in the text. See text and Appendix for sources. Robust standard errors are in parentheses.

From: Chodorow-Reich, Feiveson, Liscow, and Woolston

TABLE 4—STATE AND LOCAL GOVERNMENT, HEALTH, AND EDUCATION

	OLS			IV		
	(1)	(2)	(3)	(4)	(5)	(6)
Total FMAP payout per person 16+ (\$100,000)	0.43 (0.53)	0.34 (0.44)	0.30 (0.40)	0.99* (0.54)	1.19*** (0.37)	1.17*** (0.36)
Vote share Kerry (2004) percent/10,000		−0.76* (0.39)	−0.64 (0.39)		−1.10*** (0.30)	−1.01*** (0.32)
Union share, percent/10,000		0.16 (0.95)	0.33 (0.96)		−0.38 0.76	−0.26 0.8
GDP per person 16+ (\$1,000,000)		0.07*** (0.02)	0.07*** (0.02)		0.06*** (0.02)	0.06*** (0.02)
Employment in manufacturing, percent/10,000		−1.93** (0.89)	−1.84* (0.96)		−1.84** (0.84)	−1.77** (0.88)
State population 16+, billions		−0.11*** (0.03)	−0.10** (0.04)		−0.12*** (0.03)	−0.11*** (0.03)
Lagged total employment change May to Dec 2008			0.18 (0.18)			0.14 (0.17)
Region fixed effects?		X	X		X	X
Observations	51	51	51	51	51	51
Mean of dep. var. $\times$ 1,000	0.97	0.97	0.97	0.97	0.97	0.97

*Notes:* The outcome variable for each regression is the seasonally adjusted change in total employment in state and local government, health, and education per individual 16+ in a state, from December 2008 to July 2009. The main variable of interest is total ARRA FMAP payouts through June 30, 2010. Specifications 4–6 instrument total ARRA FMAP payouts with pre-recession Medicaid spending as described in the text. See text and Appendix for sources. Note that “government” excludes federal government employees. Robust standard errors are in parentheses.

From: Chodorow-Reich, Feiveson, Liscow, and Woolston



# Timing of Impact

- Do a Jordà-type procedure.
- Run the cross-section regression many times, increasing the horizon by 1 month each time.

Value of coefficient on FMAP outlays

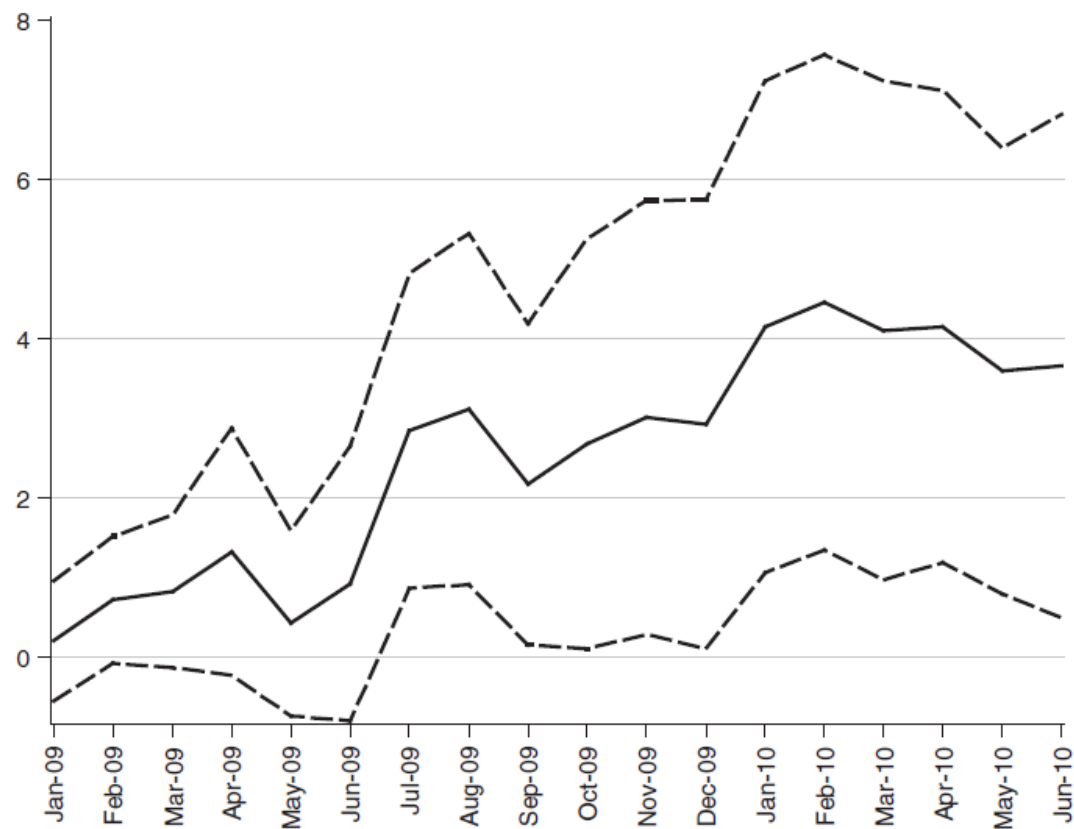


FIGURE 3. TOTAL NONFARM SECOND STAGE COEFFICIENTS

*Notes:* This chart displays the second stage coefficient for regressions where the outcome variable is the change in seasonally adjusted employment between December 2008 and the month indicated on the x-axis. The variable of interest is total FMAP outlays. Regressions include the full set of controls. The 95 percent confidence interval, derived from robust standard errors, is plotted in dashed lines.

From: Chodorow-Reich, Feiveson, Liscow, and Woolston

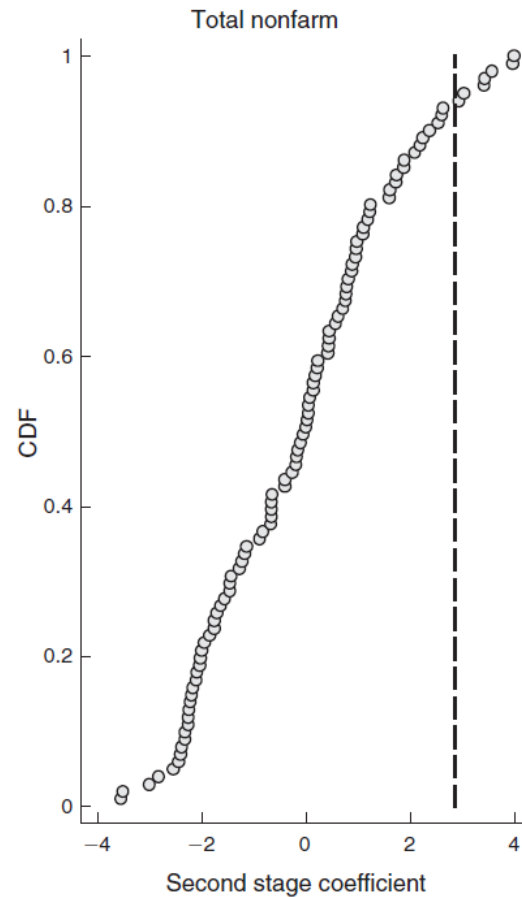


FIGURE 5. PLACEBO RESULTS

*Notes:* Plots results of second stage regressions, where the outcome variable is seasonally adjusted change in employment for each overlapping seven month period, starting in January 2000 and ending in December 2008. All regressions include the full set of control variables. Coefficient from December 2008 to July 2009 is indicated with the vertical line. Note that government excludes federal government employment.

From: Chodorow-Reich, Feiveson, Liscow, and Woolston

TABLE 6—TRANSMISSION MECHANISM

	Rainy day fund, change 2008 to 2009 (IV)			Rainy day fund, change 2009 to 2010 (IV)		
	(1)	(2)	(3)	(4)	(5)	(6)
Total FMAP payout per person 16+ (\$100,000)	−0.26 (0.18)	0.01 (0.23)	−0.14 (0.21)	−0.04 (0.09)	0.08 (0.18)	0.04 (0.17)
Region fixed effects?		X	X		X	X
Includes lagged employment?			X			X
Excludes Alaska?	X	X	X	X	X	X
Missing Washington DC?	X	X	X	X	X	X
Observations	49	49	49	49	49	−17.84
Mean of dep. var. ( $\times 100,000$ )	−29.22	−29.22	−29.22	−17.84	−17.84	−17.84

*Notes:* The outcome variable for columns 1–3 is change in a state’s rainy day fund, in \$100,000, per person 16+, from fiscal year 2008 to fiscal year 2009. The outcome variable for columns 4–6 is the change in a state’s rainy day fund, in \$100,000, per person 16+, from fiscal year 2009 to fiscal year 2010. Data are from the National Association of State Budget Officers (NASBO) Fiscal Survey of the States. The fiscal 2008 rainy day fund data come from the Fall 2009 Fiscal Survey, and the fiscal 2009 and 2010 rainy day fund data come from the Spring 2010 Fiscal Survey. All specifications exclude Washington, DC due to missing data. They also drop Alaska, an outlier in terms of the change in the state rainy day fund. Robust standard errors are in parentheses.

From: Chodorow-Reich, Feiveson, Liscow, and Woolston

# Evaluation

### III. NAKAMURA AND STEINSSON, “FISCAL STIMULUS IN A MONETARY UNION: EVIDENCE FROM U.S. REGIONS”

## Experiment They Consider

- Time series-cross section data on defense procurement by state.
- Look at whether state GDP and employment respond to defense procurement by state.

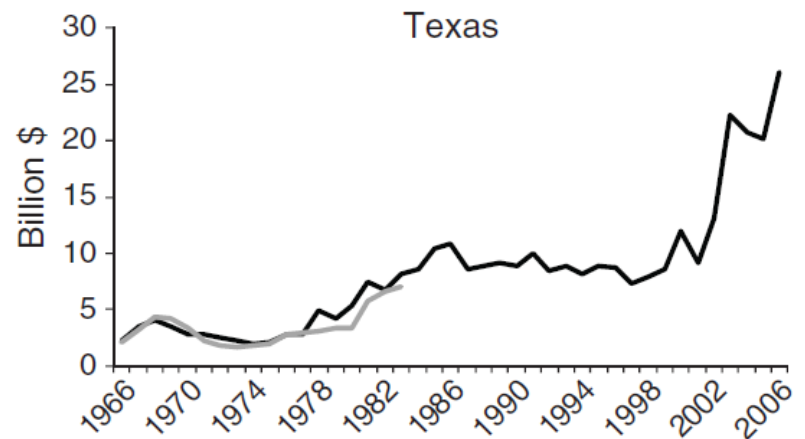
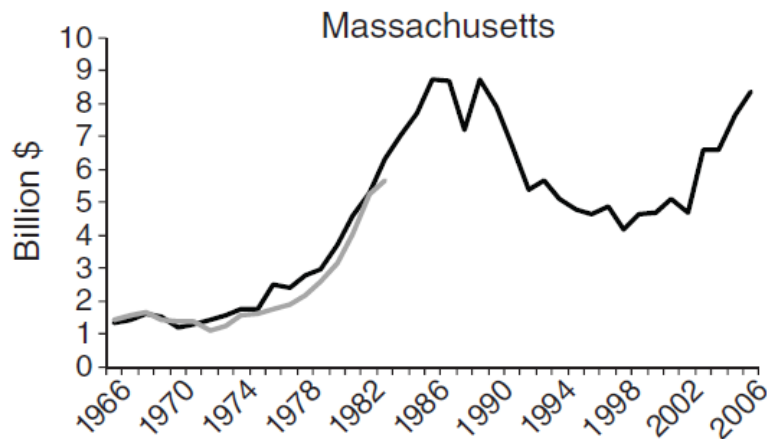
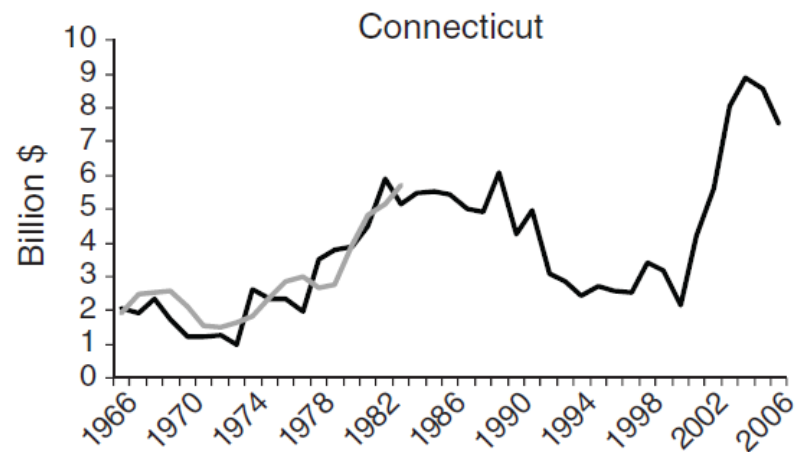
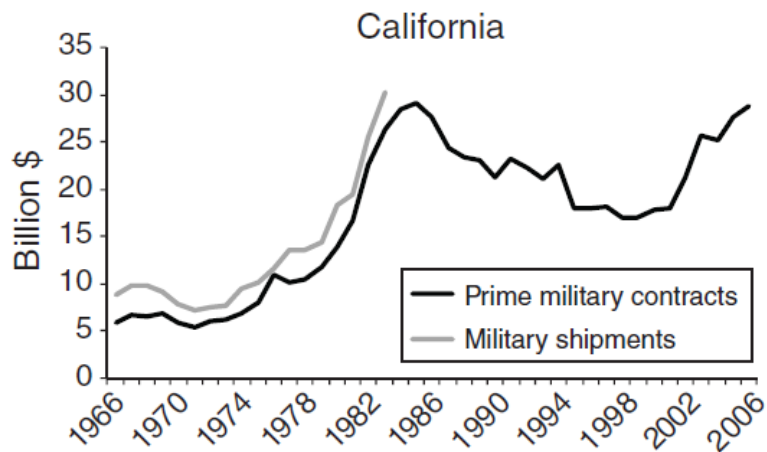


FIGURE 2. PRIME MILITARY CONTRACTS AND MILITARY SHIPMENTS

From: Nakamura and Steinsson, "Fiscal Stimulus in a Monetary Union"



# Nakamura and Steinsson's Specification

$$(1) \quad \frac{Y_{it} - Y_{it-2}}{Y_{it-2}} = \alpha_i + \gamma_t + \beta \frac{G_{it} - G_{it-2}}{Y_{it-2}} + \varepsilon_{it}$$

Where:

- $Y_{it}$  is output in state  $i$  in period  $t$
- $G_{it}$  is government procurement in state  $i$  in period  $t$
- $\alpha_i$  are state fixed effects
- $\gamma_t$  are year fixed effects

# Omitted Variable Problem

- State may be able to argue for more defense spending when local conditions are weak.
- Could imagine OVB going the other way as well—states with successful military contractors are better at winning more contracts.
- Going to use IV.
- Key assumption: national defense spending is determined by geopolitical events, not local conditions.

## IV Approach

- Instruments are national defense spending as a share of GDP interacted with state dummy variables (so 50 instruments).
- Variation comes from interaction of national shocks and differences in how sensitive state defense spending is to national spending.
- Alternative variable (Bartik instrument) is  $G_i/Y_i$  in base period times  $G_t/Y_t$  (so 1 instrument).

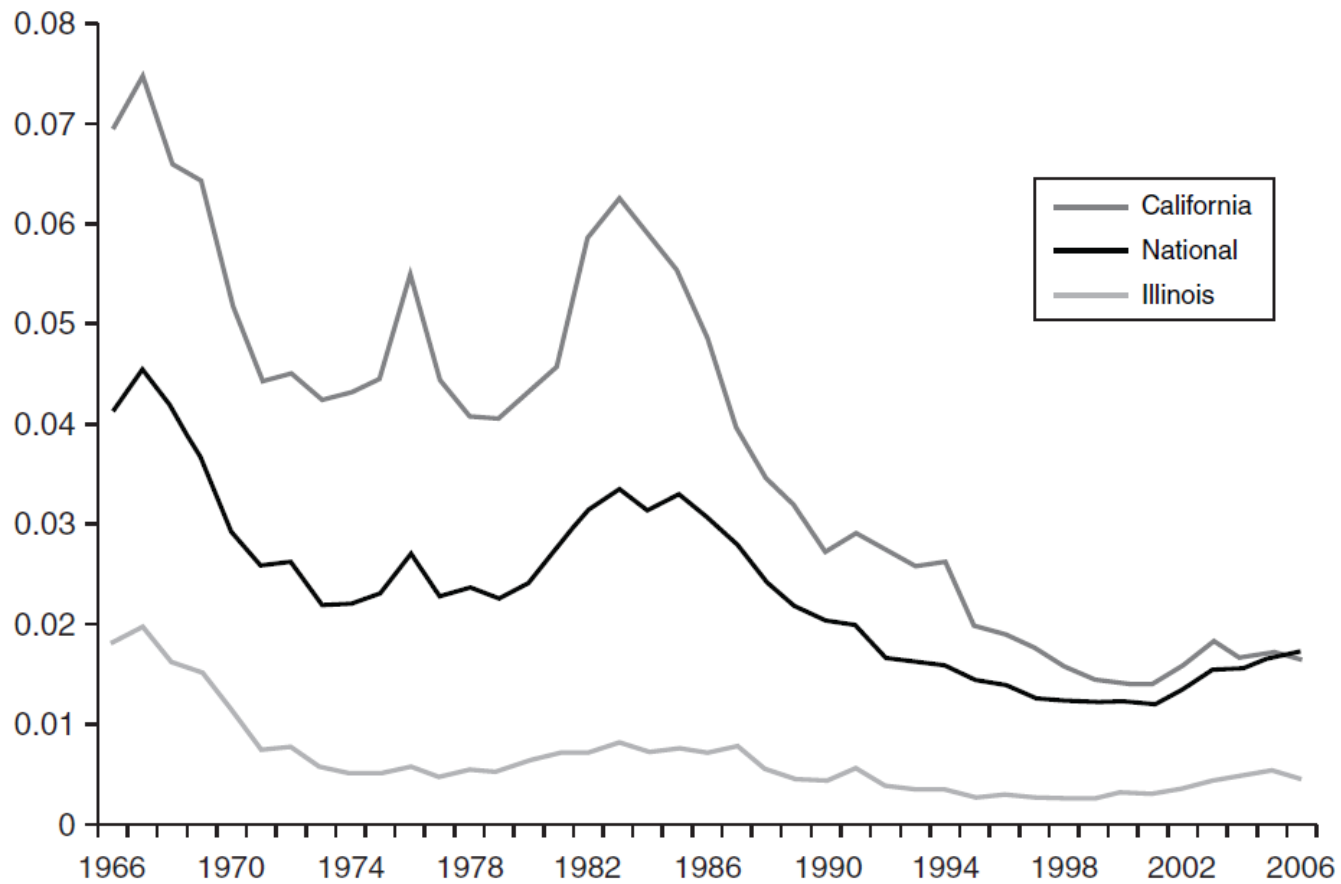


FIGURE 1. PRIME MILITARY CONTRACT SPENDING AS A FRACTION OF STATE GDP

From: Nakamura and Steinsson, "Fiscal Stimulus in a Monetary Union"

## How good are their instruments?

- When use national defense interacted with state dummy, have 50 instruments. They tell us they have a weak instrument problem.
- With Bartik instrument, only have one instrument. No weak instrument problem.
- I would like to see more diagnostics on the first stage.

TABLE 2—THE EFFECTS OF MILITARY SPENDING

	Output		Output defl. state CPI		Employment		CPI	Population
	States	Regions	States	Regions	States	Regions	States	States
Prime military contracts	1.43 (0.36)	1.85 (0.58)	1.34 (0.36)	1.85 (0.71)	1.28 (0.29)	1.76 (0.62)	0.03 (0.18)	−0.12 (0.17)
Prime contracts plus military compensation	1.62 (0.40)	1.62 (0.84)	1.36 (0.39)	1.44 (0.96)	1.39 (0.32)	1.51 (0.91)	0.19 (0.16)	0.07 (0.21)
Observations	1,989	390	1,989	390	1,989	390	1,763	1,989

*Notes:* Each cell in the table reports results for a different regression with a shorthand for the main regressor of interest listed in the far left column. A shorthand for the dependent variable is stated at the top of each column. The dependent variable is a two-year change divided by the initial value in each case. Output and employment are per capita. The regressor is the two-year change divided by output. Military spending variables are per capita except in Population regression. Standard errors are in parentheses. All regressions include region and time fixed effects, and are estimated by two-stage least squares. The sample period is 1966–2006 for output, employment, and population, and 1969–2006 for the CPI. Output is state GDP, first deflated by the national CPI and then by our state CPI measures. Employment is from the BLS payroll survey. The CPI measure is described in the text. Standard errors are clustered by state or region.

From: Nakamura and Steinsson, “Fiscal Stimulus in a Monetary Union”

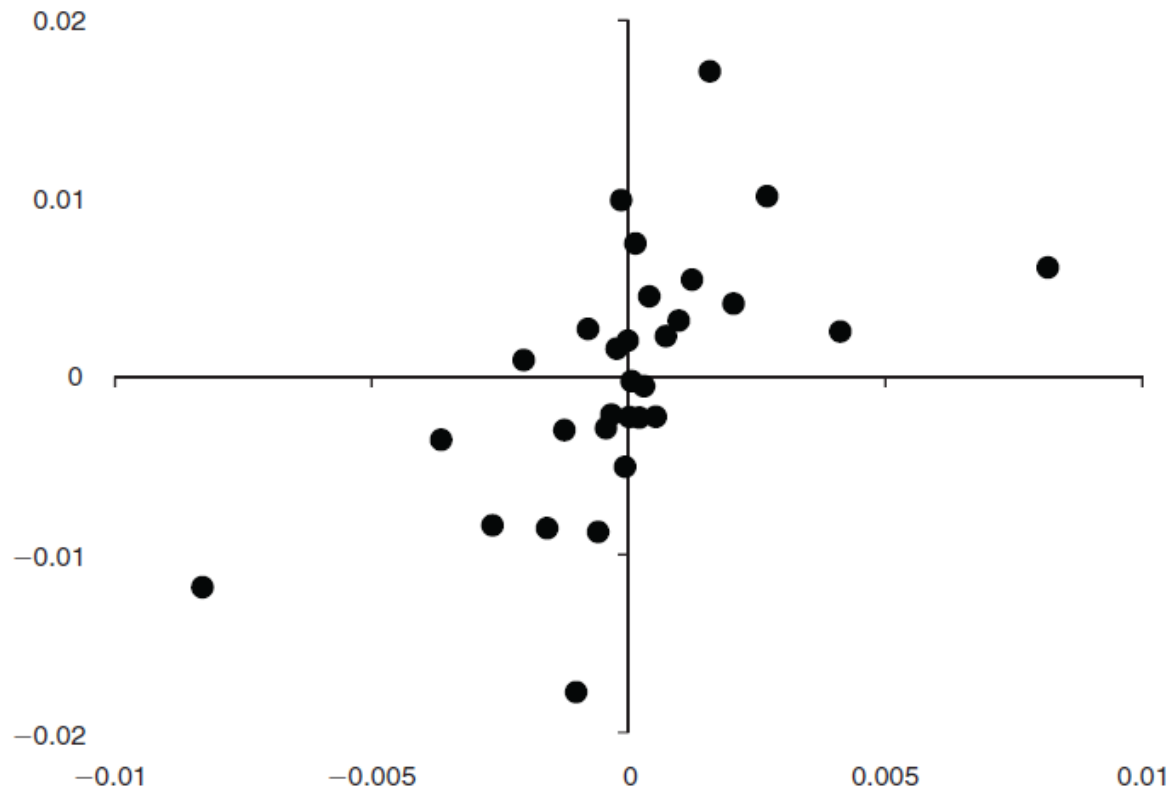


FIGURE 3. QUANTILES OF CHANGE IN OUTPUT VERSUS PREDICTED CHANGE IN MILITARY SPENDING

*Notes:* The figure shows averages of changes in output and predicted military spending (based on our first-stage regression), grouped by 30 quantiles of the predicted military spending variable. Both variables are demeaned by year and state fixed effects.

From: Nakamura and Steinsson, “Fiscal Stimulus in a Monetary Union”

TABLE 3—ALTERNATIVE SPECIFICATIONS FOR EFFECTS OF MILITARY SPENDING

	1. Output level instr.		2. Employment level instr.		3. Output per working age		4. Output OLS	
	States	Regions	States	Regions	States	Regions	States	Regions
Prime military contracts	2.48 (0.94)	2.75 (0.69)	1.81 (0.41)	2.51 (0.31)	1.46 (0.58)	1.94 (1.21)	0.16 (0.14)	0.56 (0.32)
Prime contracts plus military compensation	4.79 (2.65)	2.60 (1.18)	2.07 (0.67)	1.97 (0.98)	1.79 (0.60)	1.74 (1.00)	0.19 (0.19)	0.64 (0.31)
Observations	1,989	390	1,989	390	1,785	350	1,989	390
	5. Output with oil controls		6. Output with real int. controls		7. Output LIML		8. BEA employment	
	States	Regions	States	Regions	States	Regions	States	Regions
Prime military contracts	1.32 (0.36)	1.89 (0.54)	1.40 (0.35)	1.80 (0.59)	1.95 (0.62)	2.07 (0.66)	1.52 (0.37)	1.64 (0.98)
Prime contracts plus military compensation	1.43 (0.39)	1.72 (0.66)	1.61 (0.40)	1.59 (0.84)	2.21 (0.67)	1.90 (1.02)	1.62 (0.42)	1.28 (1.16)
Observations	1,989	390	1,989	390	1,989	390	1,836	360

*Notes:* Each cell in the table reports results for a different regression with a shorthand for the main regressor of interest listed in the far left column. A shorthand for the dependent variable plus some extra description is stated at the top of each column. The dependent variable is a two-year change divided by the initial value in each case. The dependent variables are in per capita terms. The main regressor is the two year change divided by output. Standard errors are in parentheses. Specifications: 1 and 2 use national military spending scaled by fraction of military spending in the state in 1966–1971 relative to the average fraction as the instrument for state spending; 3 constructs per capita output using the working age population, which is available starting in 1970; 4 presents OLS estimates of the benchmark specification; 5 adds the price of oil interacted with state dummies as controls; 6 adds the real interest rate interacted with state dummies as controls, where our measure of the real interest rate is the Federal Funds Rate less national CPI inflation; 7 is LIML estimate of the baseline specification; 8 estimates the employment regression using the BEA employment series, which starts in 1969. All specifications include time and regions fixed effects in addition to the main regressor of interest. Standard errors are clustered by state or region depending on the specification.



## Nakamura and Steinsson's Specification

$$(3) \quad \frac{Y_{it} - Y_{it-2}}{Y_{it-2}} = \alpha_i + \gamma_t + \beta_h \frac{G_{it} - G_{it-2}}{Y_{it-2}} + (\beta_l - \beta_h) I_{it} \frac{G_{it} - G_{it-2}}{Y_{it-2}} + \varepsilon_{it}$$

Where:

- $Y_{it}$  is output in state  $i$  in period  $t$
- $G_{it}$  is government procurement in state  $i$  in period  $t$
- $\alpha_i$  are state fixed effects
- $\gamma_t$  are year fixed effects
- $I_{it}$  is an indicator for a period of low economic slack

TABLE 5—EFFECTS OF MILITARY SPENDING IN HIGH VERSUS LOW UNEMPLOYMENT PERIODS

	Output		Employment	
	National slack	State slack	National slack	State slack
$\beta_h$	3.54 (1.55)	4.31 (1.80)	1.85 (0.87)	1.32 (0.81)
$\beta_l - \beta_h$	-2.80 (1.49)	-3.37 (1.84)	-0.75 (0.89)	0.03 (0.84)

*Notes:* A shorthand for the dependent variable is stated at the top of each column. The dependent variable is a two-year change divided by the initial value in each case. All variables are per capita. Standard errors are in parentheses. The unit of observation is US states for all regressions in the table. The two regressors are (i) the two-year change in military spending and (ii) the two-year change in military spending interacted with a dummy indicating low slackness. We employ two different measures of slackness: “National slack” refers to whether the national unemployment rate is below its median value over the sample period; “State slack” refers to whether the state unemployment rate is below its median value over the sample period. This yields the effect of spending during high unemployment periods ( $\beta_h$ ) and the difference between the effect of spending during low and high unemployment periods ( $\beta_l - \beta_h$ ). The national slack regressions include state and time fixed effects. The state slack regressions include state and time fixed effects interacted with the low slackness dummy. The regression are estimated by two-stage least squares. The sample period is 1966–2006. Output is state GDP. Employment is from the BLS payroll survey.

From: Nakamura and Steinsson, “Fiscal Stimulus in a Monetary Union”

# Evaluation

## Translating the Open-Economy Relative Multiplier into the Closed-Economy Aggregate Multiplier

- Write down a complicated, optimizing model with two regions and calibrate it.
- Generate data from the calibrated model based on different assumptions (such as sticky versus flexible prices, or accommodative versus counteracting monetary policy).
- Estimate OERM and CEAM from the generated data to see how they compare.

TABLE 6—GOVERNMENT SPENDING MULTIPLIER IN SEPARABLE PREFERENCES MODEL

	Closed economy aggregate multiplier	Open economy relative multiplier
<i>Panel A. Sticky prices</i>		
Volcker-Greenspan monetary policy	0.20	0.83
Constant real rate	1.00	0.83
Constant nominal rate	$\infty$	0.83
Constant nominal rate ( $\rho_g = 0.85$ )	1.70	0.90
<i>Panel B. Flexible prices</i>		
Constant income tax rates	0.39	0.43
Balanced budget	0.32	0.43

*Notes:* The table reports the government spending multiplier for output deflated by the regional CPI for the model presented in the text with the separable preferences specification. Panel A presents results for the model with sticky prices, while panel B presents results for the model with flexible prices. The first three rows differ only in the monetary policy being assumed. The fourth row varies the persistence of the government spending shock relative to the baseline parameter values. The fifth and sixth rows differ only in the tax policy being assumed.

From: Nakamura and Steinsson, “Fiscal Stimulus in a Monetary Union”

TABLE 7—GOVERNMENT SPENDING MULTIPLIER IN GHH MODEL

	Closed economy aggregate multiplier	Open economy relative multiplier
<i>Panel A. Sticky prices</i>		
Volcker-Greenspan monetary policy	0.12	1.42
Constant real rate	7.00	1.42
Constant nominal rate	$\infty$	1.42
Constant nominal rate ( $\rho_g = 0.50$ )	8.73	2.04
<i>Panel B. Flexible prices</i>		
Constant income tax rates	0.00	0.30
Balanced budget	−0.18	0.30

*Notes:* The table reports the government spending multiplier for output deflated by the regional CPI for the model presented in the text with the GHH preferences specification. Panel A presents results for the model with sticky prices, while panel B presents results for the model with flexible prices. The first three rows differ only in the monetary policy being assumed. The fourth row varies the persistence of the government spending shock relative to the baseline parameter values. The fifth and sixth rows differ only in the tax policy being assumed.

From: Nakamura and Steinsson, “Fiscal Stimulus in a Monetary Union”

# IV. HAUSMAN, “FISCAL POLICY AND ECONOMIC RECOVERY: THE CASE OF THE 1936 VETERANS’ BONUS”

# 1936 Veterans' Bonus

## Average Bonus in 1936 was \$547

TABLE 2—THE MAGNITUDE OF THE BONUS

	1936	2012	2012 bonus equivalent
Per capita annual income	\$530	\$39,409	\$40,673
Average annual wage of federal emergency workers	\$595	—	—
Average hourly earnings in manufacturing	\$0.62	\$19.08	\$16,853
CPI (Index, 1936 = 100)	100	1,656	\$ 9,053
Nominal house prices (Index, 1936 = 100)	100	2,506	\$13,702
Price of cheapest Ford	\$510	\$14,000	\$15,009

*Note:* The third column equals the average 1936 bonus amount, \$547, times the ratio of the second to the first column (e.g., in the first row,  $\$40,673 = \$547 \times \frac{\$39,409}{\$530}$ ).

From: Hausman, “Fiscal Policy and Economic Recovery”



## Experiment He Considers

- Did the Veterans' bonus raise consumption and output?
- Can't use aggregate time-series variation.
- He has four different approaches:
  - Cross-state analysis
  - Individual-level analysis of consumer behavior
  - American Legion survey
  - Narrative evidence

# Cross-State Analysis

- What is his approach?
- What does it capture? (MPC and local spillovers)
- Data limitations

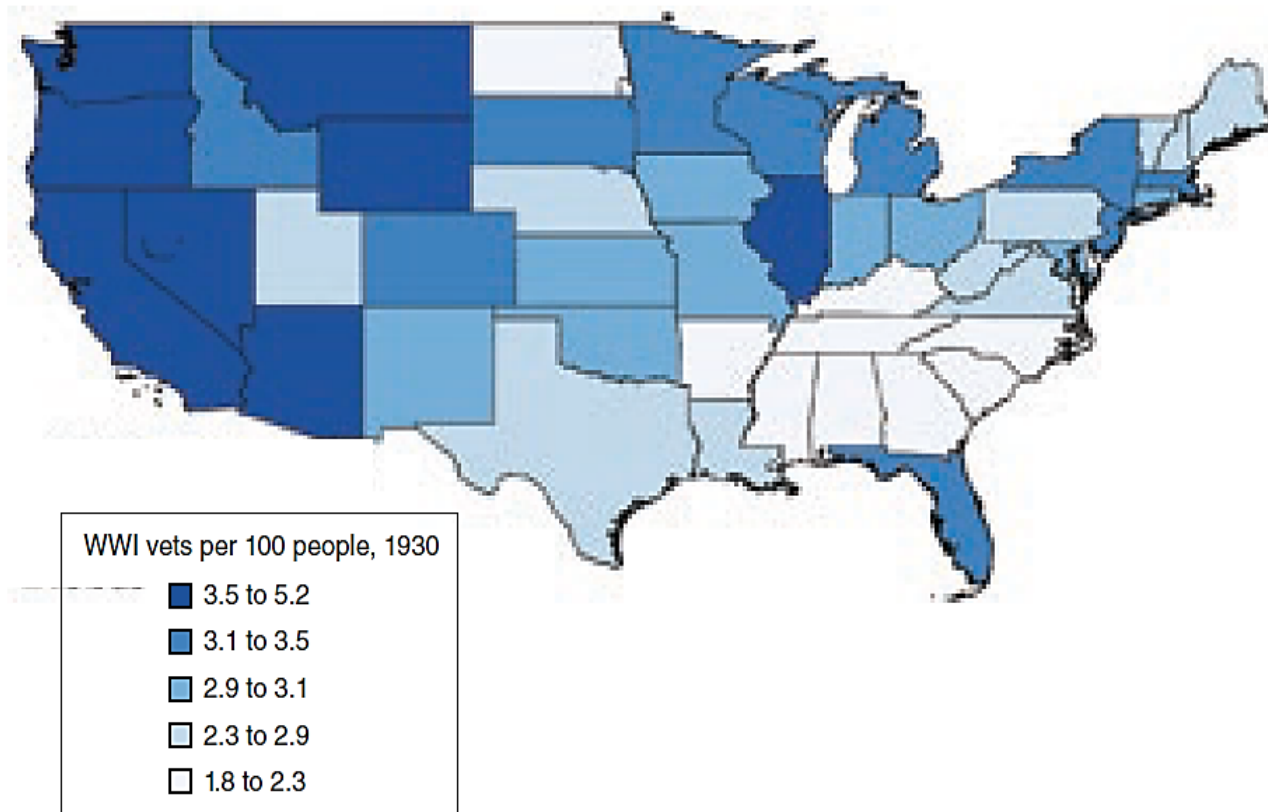


FIGURE 4. VETERANS PER 100 PEOPLE IN 1930

*Note:* Darker colors denote more veterans per capita in a state.

From: Hausman, “Fiscal Policy and Economic Recovery”

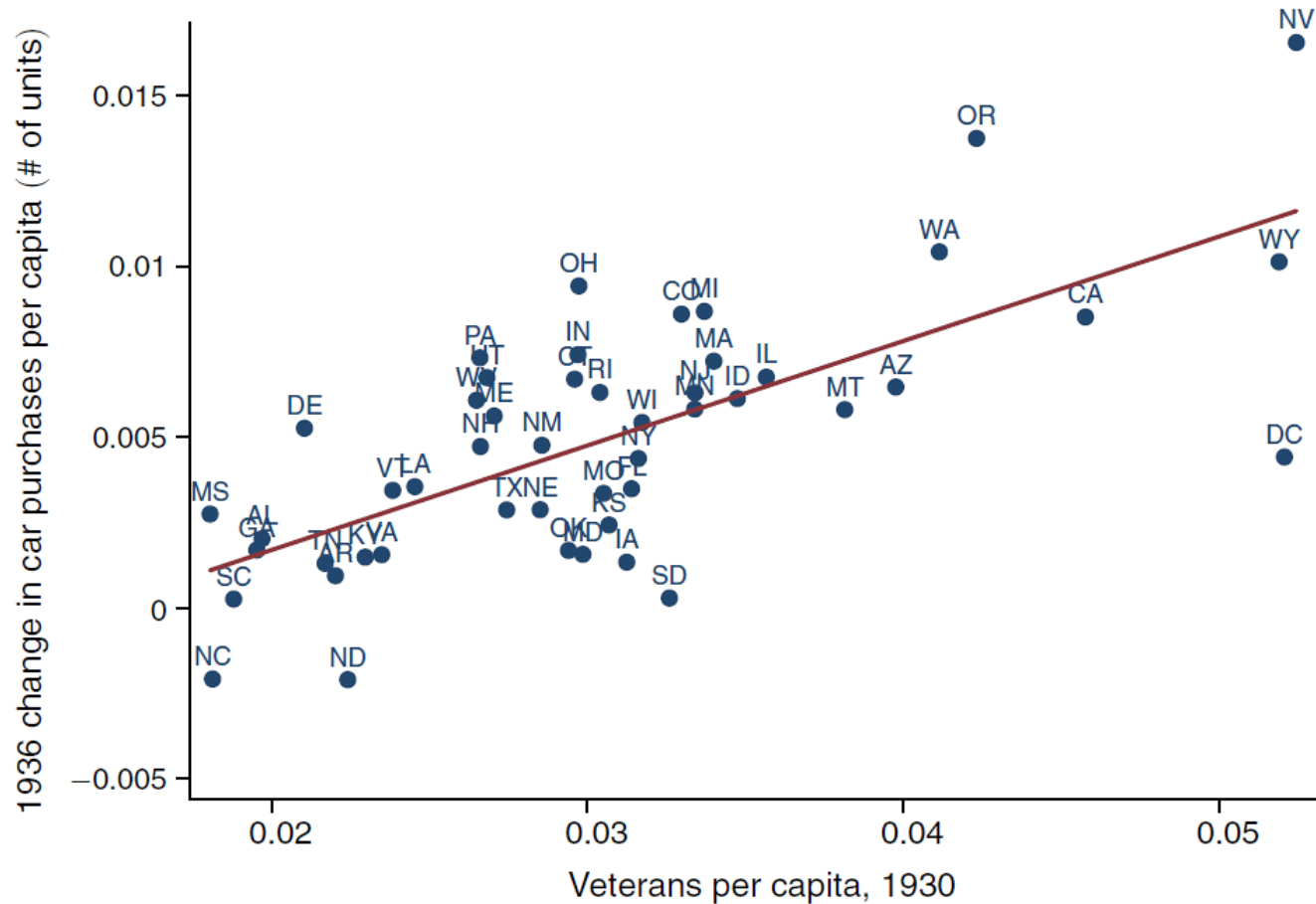


FIGURE 5. AUTO SALES PER CAPITA AND VETERANS PER CAPITA

From: Hausman, "Fiscal Policy and Economic Recovery"

Could there be omitted variable bias?

# Hausman's Specification

$$(7) \quad A_{s,1936} - A_{s,1935} = \alpha + \beta \textit{Veterans per capita}_s + \mathbf{X}'_{s,t} \boldsymbol{\theta} + \varepsilon_{s,t}$$

Where:

- $A_s$  is new car sales per capita in state  $s$
- $\mathbf{X}_s$  is a vector of control variables (such as per capita auto sales in 1929, region fixed effects, farm share of the population, black share of the population)

TABLE 9—REGRESSION RESULTS FOR THE 1936 CHANGE IN PER CAPITA NEW CAR SALES

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Veterans per capita, 1930	0.306*** (0.0648)	0.281*** (0.0801)	0.344*** (0.0806)	0.209*** (0.0692)	0.214** (0.0829)	0.360*** (0.0587)	0.276*** (0.0750)	0.332* (0.191)
Per capita new car sales in 1929		-0.0207 (0.0591)						
1930 income per capita/1,000		0.00244 (0.00269)						
$\Delta$ per capita new car sales in 1935			-0.121 (0.150)					
Midwest				-0.00180* (0.00103)				
South				-0.00263*** (0.000728)				
West				0.000979 (0.000970)				
Black share of the population					-0.00279 (0.00462)			
Farm share of the population					-0.00582** (0.00250)			
$\Delta$ drought indicator					-0.000730 (0.000458)			
$\Delta$ New Deal grants per capita/1,000						0.0539 (0.0551)		
Observations	49	49	49	49	49	48	38	21
$R^2$	0.492	0.508	0.500	0.604	0.594	0.607	0.225	0.155

Notes: The dependent variable is the change in new car sales (in number of units per capita) from 1935 to 1936.

From: Hausman, “Fiscal Policy and Economic Recovery”

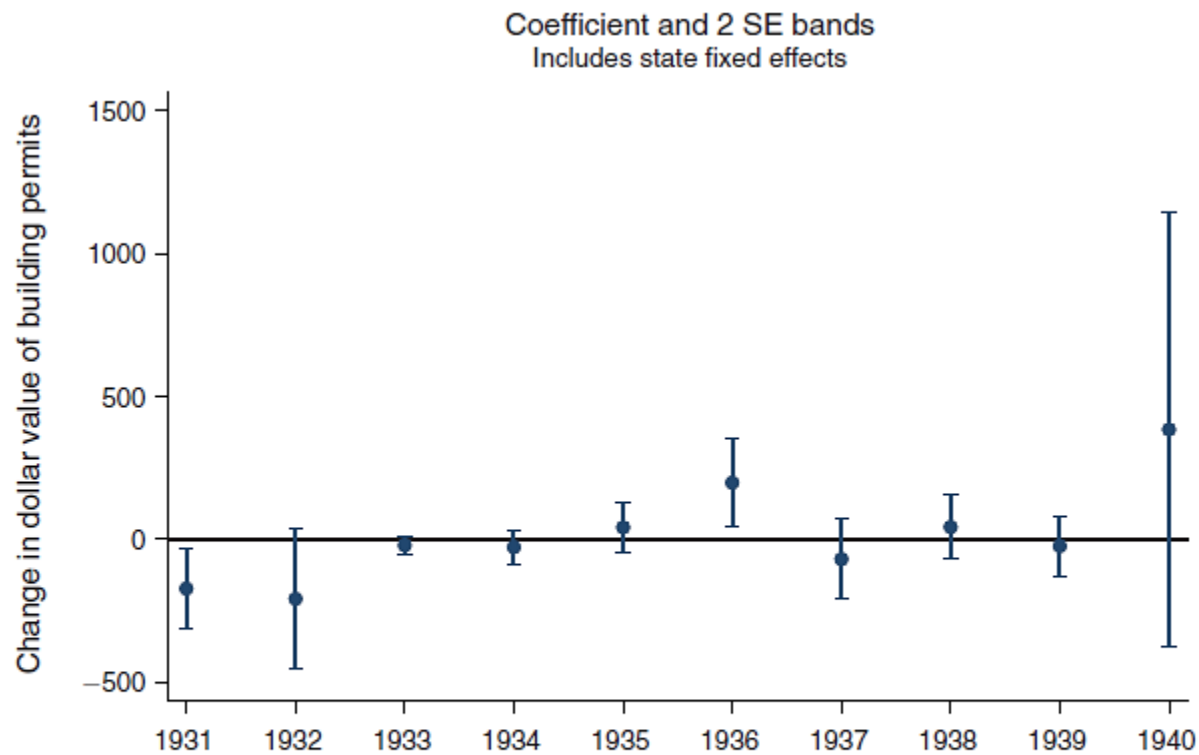


FIGURE 7. RESIDENTIAL BUILDING PERMITS AND VETERANS PER CAPITA 1931–1940.

*Note:* Standard errors are clustered at the state level.

From: Hausman, “Fiscal Policy and Economic Recovery”



## Individual-Level Analysis

- Has detailed consumer expenditure data based on a survey in 1935 and 1936.
- Key feature: Some people were surveyed before the bonus, some after.
- If he knew veteran status, he could do a difference-in-difference analysis to see if veterans raised consumption more than non-veterans following the bonus.

# Hausman's Specification

$$(1) \quad C_i = \mathbf{Z}_i' \boldsymbol{\beta}_1 + \beta_2 V_i + \beta_3 P_i + \beta_4 V_i P_i + \varepsilon_i,$$

Where  $V_i$  is a dummy for if the household contains a veteran and  $P_i$  is a dummy for if the household was surveyed after the bonus.

Consumption over Previous 12 mos.		
	Pre-Bonus	Post-Bonus
Non-Veteran		$\beta_3$
Veteran	$\beta_2$	$\beta_2 + \beta_3 + \beta_4$

How much more does consumption rise post-bonus for a non-veteran?  $\beta_3$

How much more does consumption rise post-bonus for a veteran?  $\beta_3 + \beta_4$ .

So  $\beta_4$  shows the effect on consumption post-bonus of a veteran versus a non-veteran.

# Hausman's Data Problem

- Doesn't observe whether family got a bonus or veteran status.
- How does he get around this problem?

# Hausman's Specification

Thus I estimate a first stage

$$(3) \quad V_j = \mathbf{Z}_j' \boldsymbol{\gamma} + \eta_j$$

on 1930 census data. As above  $V_j$  is veteran status, and  $\mathbf{Z}_j$  are covariates. The subscript  $j$  indicates that this equation is estimated on a different dataset than equation (1). Substituting the first stage (equation (3)) into the second stage (equation (1)) yields

$$(4) \quad C_i = \mathbf{Z}_i' \boldsymbol{\beta}_1 + \beta_2 (\mathbf{Z}_i' \boldsymbol{\gamma} + \eta_i) + \beta_3 P_i + \beta_4 (\mathbf{Z}_i' \boldsymbol{\gamma} + \eta_i) P_i + \varepsilon_i.$$

- What covariates are included in  $\mathbf{Z}_j$  and  $\mathbf{Z}_i$ ?

From: Hausman, "Fiscal Policy and Economic Recovery"

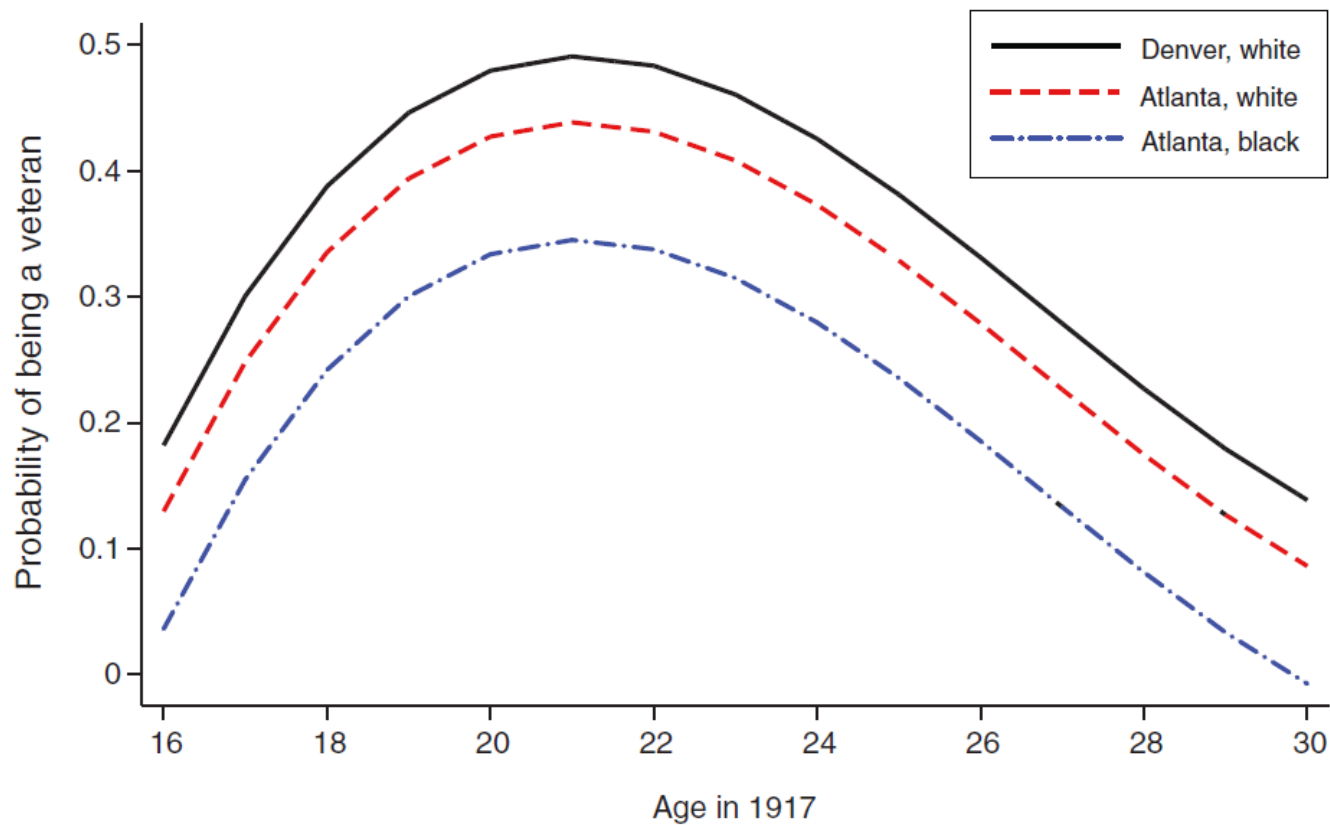


FIGURE 1. VARIATION IN PROBABILITY MAN IS A VETERAN

From: Hausman, "Fiscal Policy and Economic Recovery"

Panel A. Probability halves

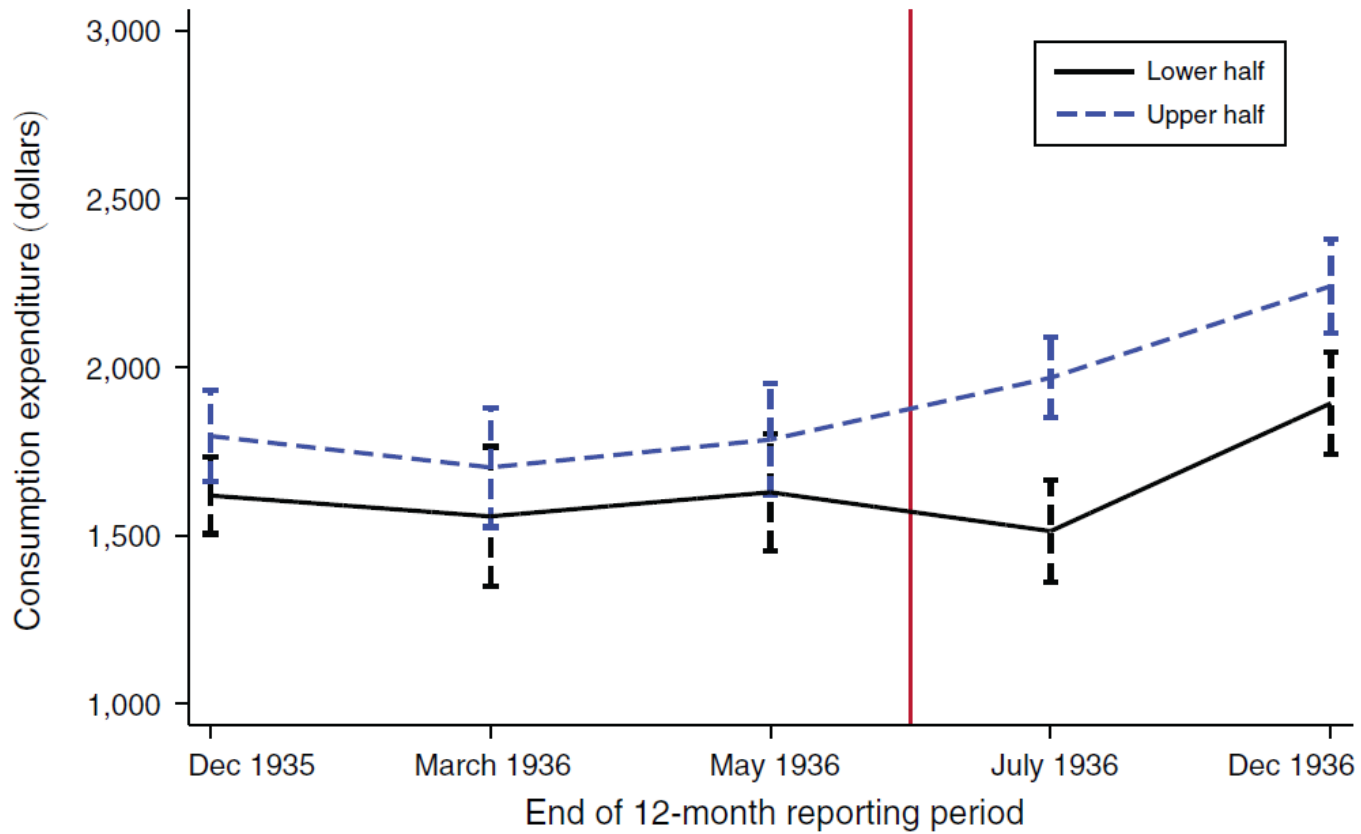


FIGURE 2. CONSUMPTION TRENDS

From: Hausman, "Fiscal Policy and Economic Recovery"

TABLE 5—TOTAL EXPENDITURE AND SAVING REGRESSIONS

	Total C (1)	Total C (2)	Insurance policies settled (3)	Gifts received (4)
Post bonus dummy	264.1*** (70.52)	198.2*** (43.17)	−5.590 (4.292)	0.0742 (6.855)
Interaction	647.2* (379.4)	403.1** (169.7)	96.0*** (22.88)	152.4*** (46.45)
Omit if expenditure > \$5,000	No	Yes	Yes	Yes
Observations	2,745	2,681	2,681	2,339
$R^2$	0.152	0.186	0.034	0.048

*Notes:* All columns include the full set of second stage controls for age, race, and geography. See the text for details.

From: Hausman, “Fiscal Policy and Economic Recovery”

TABLE 7—CONSUMPTION CATEGORY REGRESSIONS

	Auto purchases and operations (1)	Housing (2)	Furniture/ equipment (3)	Clothing (4)	Recreation (5)	Food (6)
Post bonus dummy	47.77*** (10.77)	9.497 (8.425)	4.954 (5.244)	41.48*** (7.734)	9.326*** (3.132)	29.94** (12.77)
Interaction	127.5** (60.30)	83.38*** (29.39)	21.71 (20.44)	32.92 (27.09)	24.86 (15.76)	35.10 (45.66)
Observations	2,681	2,681	2,681	2,681	2,681	2,681
$R^2$	0.072	0.204	0.051	0.091	0.074	0.231

*Notes:* See the text for a description of the controls. Households with total expenditure > \$5,000 are excluded. Bootstrap standard errors clustered at the city level in parentheses.

From: Hausman, “Fiscal Policy and Economic Recovery”



## American Legion Survey

- Another case where there is data one might not have expected.
- Under-utilized archivists can be your friend.
- Analogous to studies asking consumers how they plan to use tax rebates.

Figure 9: American Legion survey form

ALL INFORMATION CONTAINED HEREIN IS UNCLASSIFIED

**PLEASE CO-OPERATE**

BY

**FILLING OUT AND HANDING TO POST ADJUTANT AT ONCE**

**MEMBER LEGIONNAIRE:**

Members of The American Legion are asked to lend their co-operation to National Headquarters to determine as accurately as possible in advance how money derived from payment of the Adjusted Service Certificates will be spent. You can do this by filling out this questionnaire and handing it to your Post Adjutant.

To fill out, put a check mark in the square in front of the product listed which you now think you will purchase, if and when you receive payment on your adjusted compensation certificate, and after the name of the product indicate approximately how much you think you will spend for that particular item. It is important that the amount of the estimated expenditure for each particular item be shown on the questionnaire.

On the blank lines at the bottom, list any other articles, items or ways in which you contemplate the expenditure of your adjusted compensation not contained in the printed list.

It is also important that the total amount of adjusted compensation to be received should be shown by you at the bottom of the questionnaire in the space provided.

Percentages will be obtained from all the questionnaires filled out which will be projected against the total payments to be made. Each individual questionnaire is confidential; no names or identification marks of any sort should be placed on it.

**ARTICLES TO BE BOUGHT**

	Approximate Amount to Be Expended Therefor	
<input type="checkbox"/> Agricultural Implements .....	\$.....	
<input type="checkbox"/> Automobile .....	\$.....	
Do you own car to trade in?		
Yes.....		
No .....		
<input type="checkbox"/> Auto Truck .....	\$.....	
<input type="checkbox"/> Battery for Auto or Truck.....	\$.....	
<input type="checkbox"/> Tires for Auto or Truck.....	\$.....	
<input type="checkbox"/> Build New House .....	\$.....	
<input type="checkbox"/> Clothes for Children .....	\$.....	
<input type="checkbox"/> Suit or Overcoat for Self.....	\$.....	
<input type="checkbox"/> Clothes for wife .....	\$.....	
<input type="checkbox"/> Education, Home Study Course.....	\$.....	
<input type="checkbox"/> Electric or Gas Refrigerator.....	\$.....	
<input type="checkbox"/> Farm .....	\$.....	
<input type="checkbox"/> Furniture .....	\$.....	
<input type="checkbox"/> House Furnishings .....	\$.....	
<input type="checkbox"/> Insurance .....	\$.....	
(Life, Health or Accident)		
<input type="checkbox"/> Invest in Own Business .....	\$.....	
<input type="checkbox"/> Invest in Stocks or Bonds.....	\$.....	
<input type="checkbox"/> Lot for Home Site .....	\$.....	
<input type="checkbox"/> Men's Shirts .....	\$.....	
<input type="checkbox"/> Men's Furnishings .....	\$.....	
(Ties, Socks, Underwear)		
<input type="checkbox"/> Men's Hats .....	\$.....	
<input type="checkbox"/> Men's Shoes .....	\$.....	
<input type="checkbox"/> Oil or Gas Furnace .....	\$.....	
<input type="checkbox"/> Paint House .....	\$.....	
<input type="checkbox"/> Pay Notes, Mortgages, Loans or Old Bills .....	\$.....	
<input type="checkbox"/> Purchase Home .....	\$.....	
<input type="checkbox"/> Radio .....	\$.....	
<input type="checkbox"/> Repair House .....	\$.....	
<input type="checkbox"/> Rugs .....	\$.....	
<input type="checkbox"/> Start or Increase Savings Accounts.....	\$.....	
.....		\$.....
.....		\$.....
.....		\$.....
.....		\$.....
.....		\$.....
Total Amount of Adjusted Compensation Due .....		\$.....

From: Hausman, "Fiscal Policy and Economic Recovery"

TABLE 11—AMERICAN LEGION SURVEY TABULATIONS

Item	Amount per veteran (\$)	Percent of bonus
Housing consumption	47.62	8.43
Durable goods excluding autos	44.22	7.82
Clothing	39.76	7.04
Passenger automobiles	30.86	5.46
Trucks	4.02	0.71
Automobile tires and batteries	1.67	0.30
Nonresidential investment	69.33	12.27
Residential investment	72.11	12.76
Other spending	46.91	8.30
<b>Spending total</b>	<b>356.60</b>	<b>63.08</b>
 <b>Pay old bills and debts</b>	 <b>177.26</b>	 <b>31.36</b>
Savings accounts	25.26	4.47
Purchase stocks or bonds	6.15	1.09
Savings total	208.68	36.92

*Source:* Complete tabulations from the American Legion. See online Appendix H.

From: Hausman, “Fiscal Policy and Economic Recovery”

# Narrative Evidence



From: Hausman, "Fiscal Policy and Economic Recovery"

A useful check on the quantitative evidence of previous sections comes from newspaper reports at the time: given my results, it would be troubling if newspapers did not report high spending by veterans. In fact, they reported a spending boom.

For example, the *Los Angeles Times* wrote on June 19, 1936, four days after the bonus was distributed (p. A1):

All signs yesterday pointed to a real spending spree by veterans. . . . Downtown department stores reported yesterday's sales were more than 30 percent above a week ago.

The *Wall Street Journal* reported a couple weeks later, on July 3 (p. 1):

Unusual gains in retail sales of new passenger cars the latter part of last month lifted the June retail sales totals of the largest automobile units to new peaks for the year. . . . Such a development was not expected, the belief of automobile people being that June sales would not be able to maintain the fast pace of April and May, usual months for peak in new car sales. No doubt the bonus had something to do with pushing sales into new high ground, but generally strong business throughout most of the country played an equal part in providing support.

From: Hausman, “Fiscal Policy and Economic Recovery”

# Aggregate Impact of the Bonus

TABLE 12—EFFECT OF THE BONUS ON 1936 GDP GROWTH

Spending multiplier	Effect on 1936 growth (percentage points)
0.5	0.8
1.0	1.6
1.5	2.4
2.0	3.3

*Source:* See text.

From: Hausman, “Fiscal Policy and Economic Recovery”

# Evaluation