

Brief Summary of Some of the Cross-Section and Panel
Estimates of Fiscal Multipliers

Nakamura, Emi, and Jón Steinsson. 2014. "Fiscal Stimulus in a Monetary Union: Evidence from US Regions." *American Economic Review*, 104(3): 753-92.

We use rich historical data on military procurement to estimate the effects of government spending. We exploit regional variation in military build-ups to estimate an "open economy relative multiplier" of approximately 1.5. We develop a framework for interpreting this estimate and relating it to estimates of the standard closed economy aggregate multiplier. The latter is highly sensitive to how strongly aggregate monetary and tax policy "leans against the wind." Our open economy relative multiplier "differences out" these effects because monetary and tax policies are uniform across the nation. Our evidence indicates that demand shocks can have large effects on output.

We analyze the effects of government spending in a monetary and fiscal union—the United States. We estimate the effect that an increase in government spending in one region of the union *relative* to another has on *relative* output and employment. We refer to this as the "open economy relative multiplier." We use variation in regional military procurement associated with aggregate military buildups and drawdowns to estimate these effects. The "open economy relative multiplier" we estimate differs conceptually from the more familiar "closed economy aggregate multiplier" that one might estimate using aggregate US data. At first glance, this might seem to be a pure disadvantage, since much interest is focused on the closed economy aggregate multiplier. We show, however, that the open economy relative multiplier has important advantages. These advantages stem from the fact that *relative* policy is precisely pinned down across regions in the United States: The Federal Reserve cannot raise interest rates in some states relative to others, and federal tax policy is common across states in the union.

Chodorow-Reich, Gabriel, Laura Feiveson, Zachary Liscow, and William Gui Woolston. 2012. "Does State Fiscal Relief during Recessions Increase Employment? Evidence from the American Recovery and Reinvestment Act." *American Economic Journal: Economic Policy*, 4(3): 118-45.

The American Recovery and Reinvestment Act (ARRA) of 2009 included \$88 billion of aid to state governments administered through the Medicaid reimbursement process. We examine the effect of these transfers on states' employment. Because state fiscal relief outlays are endogenous to a state's economic environment, OLS results are biased downward. We address this problem by using a state's prerecession Medicaid spending level to instrument for ARRA state fiscal relief. In our preferred specification, a state's receipt of a marginal \$100,000 in Medicaid outlays results in an additional 3.8 job-years, 3.2 of which are outside the government, health, and education sectors.

Wilson, Daniel J. 2012. "Fiscal Spending Jobs Multipliers: Evidence from the 2009 American Recovery and Reinvestment Act." *American Economic Journal: Economic Policy*, 4(3): 251-82.

This paper estimates the "jobs multiplier" of fiscal stimulus spending using the state-level allocations of federal stimulus funds from the American Recovery and Reinvestment Act (ARRA) of 2009. Because the level and timing of stimulus funds that a state receives was potentially endogenous, I exploit the fact that most of these funds were allocated according to exogenous formulaary allocation factors such as the number of federal highway miles in a state or its youth share of population. Cross-state IV results indicate that ARRA spending in its first year yielded about eight jobs per million dollars spent, or \$125,000 per job.

The American Recovery and Reinvestment Act: Solely a government jobs program?

Timothy G. Conley and Bill Dupor

Abstract

This paper estimates the private and government sector employment effects of American Recovery and Reinvestment Act (ARRA) spending via an instrumental variables strategy. We argue that this aid was effectively fungible and states used it to offset declines in revenue. This enables us to use exogenous variation in states' budget positions to identify the Act's employment effects. We also exploit exogenous variation across states in ARRA highway funding. According to our benchmark estimates, average state and local government employment, during the 24 months following the program's inception, was between 156,000 and 563,000 persons greater as a result of ARRA spending (90% confidence interval). The corresponding estimate for the private sector ranges from a loss of 182,000 to a gain of 1.1 million jobs. Our point estimate for the implied cost of creating a job lasting one year is \$202,000, which is substantially larger than the corresponding estimate from the President's Council of Economic Advisors.

Geographic Cross-Sectional Fiscal Spending Multipliers: What Have We Learned?[†]

By GABRIEL CHODOROW-REICH*

A geographic cross-sectional fiscal spending multiplier measures the effect of an increase in spending in one region of a monetary union. Empirical studies of such multipliers have proliferated. I review this research and what the evidence implies for national multipliers. Based on an updated analysis of the ARRA and a survey of empirical studies, my preferred point estimate for a cross-sectional multiplier is 1.8. The paper also discusses conditions under which the cross-sectional multiplier provides a rough lower bound for the national, no-monetary-policy-response multiplier. Putting these elements together, the cross-sectional evidence suggests a national no-monetary-policy-response multiplier of 1.7 or above. (JEL E32, E52, E62, H54, H76, R53)

Handbook of Macroeconomics

Chapter 31 – Fiscal Multipliers[☆]: Liquidity Traps and Currency Unions

[E. Farhi](#)^{*},

[I. Werning](#)[†]

We provide explicit solutions for government spending multipliers during a liquidity trap and within a fixed exchange regime using standard closed and open-economy New Keynesian models. We confirm the potential for large multipliers during liquidity traps. For a currency union, we show that self-financed multipliers are small, always below unity, unless the accompanying tax adjustments involve substantial static redistribution from low to high marginal propensity to consume agents, or dynamic redistribution from future to present non-Ricardian agents. But outside-financed multipliers which require no domestic tax adjustment can be large, especially when the average marginal propensity to consume on domestic goods is high or when government spending shocks are very persistent. Our solutions are relevant for local and national multipliers, providing insight into the economic mechanisms at work as well as the testable implications of these models.

Re-examining Chodorow-Reich's Estimates

Table 1—: ARRA Example

	Dependent variable:				
	Job years per \$100K spent				GSP
	(1)	(2)	(3)	(4)	(5)
Endogenous variable:					
Total ARRA spending	2.29 (0.71)	2.22 (1.22)	1.82 (0.69)	2.01 (0.59)	1.53 (1.19)
Instruments	<i>FMAP</i>	<i>DOT</i>	<i>DM</i>	ALL	ALL
Estimator	2sls	2sls	2sls	2sls	2sls
First stage coefficient	0.36	1.66	6.76	.	.
First stage F statistic	35.9	9.8	52.0	46.1	129.3
First stage R^2	0.40	0.23	0.55	0.73	0.87
Hansen J statistic p-value				0.76	0.34
Observations	50	50	50	50	50

95%
confidence
band:
(0.85, 3.17)

Relevant
instruments

Passes over-
identification
test

Notes: The table reports cross-state regressions of the effect of ARRA spending on employment (columns 1-4) or gross state product (column 5) during 2009 and 2010. ARRA spending is instrumented using pre-recession Medicaid spending (*FMAP*), Department of Transportation formula (*DOT*), and other pre-recession formulae (*DM*) as described in the text. All specifications also control for the employment change from December 2007 to December 2008 normalized by the December 2008 population 16+, gross state product (GSP) growth from the fourth quarter of 2007 to the fourth quarter of 2008, and the December 2008 ratio of employment to the population 16+. In columns (1)-(4) Total ARRA spending and the instruments are normalized by the December 2008 population 16+. In column (5), Total ARRA spending and the instruments are normalized by 2008Q4 GSP. Eicker-White standard errors in parentheses. Following AEA guidelines, symbolic indicators of significance are omitted.

What happens if we correct the estimates?

- Using Chodorow-Reich's replication files, **I re-estimate his model but weight each state by population and use total state and local induced spending.**
- The estimates are for job-years per \$100K but that is approximately equal to the output multiplier.

	Chodorow-Reich estimate	Weighted by population	All govt spending, weighted by pop
Multiplier	2.01	1.15	0.89
Robust s.e.	(0.59)	(0.72)	(0.45)

Bottom line: now the ARRA multiplier estimates look like the average historical aggregate estimates.