

Fiscal Multipliers

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Samuelson Prediction

- Predicted major negative effect of U.S. post-WWII demobilization on GDP and employment, based on large spending multiplier. Ratio of federal purchases to GDP down by more than 25 percentage points.
- GDP down in 1946-47. But economy did well overall. Resources moved from public to private uses.

WWII Spending

- Strong positive effect of U.S. military spending during WWII on GDP. Multiplier positive but less than 1. Therefore, private parts of GDP crowded out—mostly investment broadly construed.
- By 1940-41, already strong recovery from Great Depression trough of 1932-33. But economy still in recession in 1940-41.

Cuts in U.S. Defense & Other Spending in Sequester of 2013

- Failed Samuelson prediction makes one skeptical about major negative effects on GDP & employment.
- Standard stories of multiplier effects from defense cuts do not allow for shift of resources to private economy.
- Direct effects of programs may be visible. Full effects impossible to see directly.

- Key is not stories of economic effects but evidence on size of spending multiplier.
- Greater than 1 means defense cuts lead to fall in private parts of GDP.
- Positive but less than 1 means that private parts rise but by less than fall in defense.
- Negative means that private parts rise by more than fall in defense. Consistent with longer-term growth evidence.

Problems in Estimating (Identifying) Spending Multipliers

- Difficult to estimate government-spending multipliers because of reverse causation—spending reacting to economy. Related problem is common effect of third factor—e.g. war or natural disaster implying GDP down and government spending up.
- Example of reverse causation: U.S. state & local purchases tend to be procyclical—up in booms down in recessions. If not taken into account, get over-estimate of spending multiplier. Easy to get multipliers for non-defense purchases (mostly state & local) of 2 or more.

- Different case is welfare-related transfers (unemployment compensation, disability, food stamps), which tend to be counter-cyclical—up in recessions, down in booms.
- If not taken into account, spending multiplier for transfers tends to be under-estimated, typically negative.

- Consider only empirical studies that make convincing effort at “identification.” Do not use studies that rely on timing assumption; government purchases assumed to move first.
- Three types of empirical estimates in literature seem reliable.

Empirical Estimates of Spending Multipliers

- First type is time-series studies, mostly U.S., using variations in defense spending. Key is that changes, especially related to war & peace, can be treated as exogenous.
- Second type is study by Kraay on variations in (random) timing of disbursements of World Bank loans for developing countries.
- Third type involves effects of federal spending programs across U.S. states. Relative spending across states may be exogenous.

Table 1
Estimates of Spending Multipliers

Author and Study	Multiplier estimate	Notes
Time-Series Macroeconomic Studies Based on Defense Spending		
Barro (1984)	≈ 0.6	U.S. defense spending increases in WWI, WWII, Korean War.
Hall (1986)	≈ 0.6	U.S. defense spending, 1920-42, 1947-82.
Ramey (2011)	0.6-1.2	U.S. defense spending, 1939-2008, estimates based on defense-news variable, short-run versus long-run, deficit-financed.
Fisher and Peters (2010)	> 0	U.S. defense spending, 1948-2007, estimates based on stock returns of defense contractors, cumulative effects over 5 years for 1959-2007.
Barro and Redlick (2011)	0.4-0.8	U.S. defense spending, 1917-2006, short-run versus long-run, temporary versus permanent (based on defense news), deficit-financed, applies to increases or decreases.
Hall (2009)	≈ 0.5	U.S. defense spending, 1930-2008.
Owyang, Ramey, Zubairy (2013)	$\approx 0.6-0.9$	U.S. (1890-2010) and Canada (1922-2011) defense spending, based on defense news, short-run versus long-run, deficit-financed, interactions with unemployment rate.

Author and Study	Multiplier estimate	Notes
A Panel Study Based on the Timing of Loan Disbursements from the World Bank		
Kraay (2012)	0.5-0.7	Uses timing of World Bank loan disbursements to 29 developing countries, 1985-2009, short-run.
Panel Studies for U.S. States		
Nakamura and Steinsson (2012)	≈ 1.4	U.S. defense spending across U.S. states, 1966-2006, responses of state real GDP over two years.
Cohen, Coval, Malloy (2011)	< 0	Federal spending in U.S. states, driven by states' political power in U.S. Congress, effects on corporate investment and employment and on state GDP and total employment, 1967-2008.
Wilson (2012)	> 0	ARRA cross-U.S. state spending except for UI, 2009-10, effects on state employment.
Chodorow-Reich, et al. (2012)	> 0	ARRA cross-U.S. state spending on Medicaid, 2009-10, effects on state employment.

Effects from Defense Spending

- Time-series evidence useful because major variations—associated with war & peace—plausibly exogenous. Also changes are large and both positive & negative.
- Does not work for macro disasters from wars—especially WWI & WWII—with major destruction of property & people.

- Evidence particularly from U.S. Other potential cases are Canada, Australia, New Zealand during world wars. Also neutral countries: Switzerland & Sweden.
- Some evidence on interaction with state of economy—unemployment rate still high in 1941 (U.S.), 1939 (Canada).
- Multiplier affected by production mandates, military draft, rationing, patriotism effect on labor supply?

U.S. Wars & Broader Time Series

- Simple estimate from Barro (1984) for WWI, WWII, Korean War is multiplier around 0.6. Similar results in Hall (1986, 2009). Main crowding out in investment components, including consumer durables.
- Ramey (2011) finds similar short-run multiplier using defense-news variable as “instrument.” Longer-run multiplier around 1.1. Applies to deficit finance with spending viewed as permanent.

- Fisher & Peters (2010) used excess stock returns of defense contractors. Less explanatory power for defense spending than Ramey's narrative approach.
- Barro & Redlick (2011) treated variations in U.S. defense purchases—especially in wars & post-war demobilizations—as exogenous. Separate measure of tax rates. Ramey defense-news variable used to gauge expectations of future spending.

- Defense-spending multiplier 0.4-0.5 within year, 0.6-0.7 over 2 years, higher by 0.1-0.2 when viewed as permanent. Results with deficit finance comparable to Ramey's. Balanced-budget multiplier negative (with tax finance).
- Applies as much to decreases in defense spending (e.g. 1946-47 and 1954-55) as to increases (e.g. WWI, WWII, Korean War).

- Owyang, Ramey, Zubairy (2013) extended Ramey analysis to longer-term U.S. data and Canada. Canada results (not U.S.) suggested multiplier larger when unemployment rate higher. Not found for U.S. (consistent with Barro & Redlick).
- Could study interaction of multiplier with recessions further for Canada, Australia, New Zealand.

Kraay (2012) on Timing of World Bank Disbursements of Loans

- Studied responses of real GDP in 29 developing countries to World Bank loan disbursements, 1985-2009. Loans difficult to assess directly because amount and timing depend on country's economic conditions.
- Kraay avoided problem by using timing of disbursements over several years following approvals. Much of variation reflected arbitrary bureaucratic procedures—regarded as random.
- Analysis showed positive response of real GDP within year to government expenditure driven by timing of World Bank disbursements. Estimated spending multiplier 0.5-0.7; in ballpark of estimates from macro studies of defense spending.

Effects of Federal Spending across U.S. states

- Under some circumstances, changes in federal spending at state (or local) level independent of state's economic conditions. Therefore, easier to assess effects of government spending on economy, rather than reverse.
- Serious shortcoming is that state spending multipliers not readily applied to national context. At state level, federally-financed expenditure nearly free, not only currently (sort of true for deficit-financed federal spending) but also prospectively. Therefore, computed state spending multipliers exclude income & substitution effects from higher current and future taxes, which apply at federal level.

Nakamura & Steinsson (2012)

- Gauge response of state real GDP and other variables to federal defense contracts for each state. Idea is that variations in aggregate defense spending occur differentially across states in way predictable from history.
- For example, when federal defense rises, spending tends to be allocated disproportionately (in relation to each state's GDP) to California and Connecticut rather than Illinois.
- Pattern allowed Nakamura & Steinsson to isolate effects of federal defense spending within state on state's real GDP. Specifically, they filtered out reverse causation, whereby poor economic conditions in state may raise state's share of overall defense budget.

- Result for 1966-2006 is estimated state spending multiplier around 1.4 over 2 years. Estimate higher than that at national level in Barro & Redlick (2011)—comparable number over 2 years for deficit-financed spending expected to be permanent was 0.7-0.9.
- One reason state spending multiplier higher is that spending nearly free, coming from current or prospective taxes levied mostly on residents of other states.
- Another consideration is that responses of state's real GDP reflect mobility of labor and capital from other states—effect would not operate substantially at national level.

Cohen, Coval, Malloy (2011)

- Examined array of federal spending programs (earmarks, transfers, government contracts) in U.S. states. Focus on response of outlays to exogenous changes in states' political power in U.S. Congress.
- Over 1967-2008, added state spending driven by state's enhanced political power led to declines in investment and employment by corporations headquartered in state. Also found declines in overall state real GDP and employment. Hence, estimated state spending multipliers were negative.

Wilson (2012) and Chodorow-Reich, et al. (2012)

- Focus on effects across U.S. states from spending under American Recovery and Reinvestment Act (ARRA) in 2009-10. Idea is that many forms of spending driven by formulas that allocated funds to states in relative amounts predictable from conditions before 2007-09 recession.
- For example, in 2009-10, states with lots of highways got disproportionate share of highway spending, places with large youth population got disproportionate share of educational funding, and states with history of many Medicaid recipients got disproportionate share of Medicaid payments.
- Using these patterns, possible to filter out parts of ARRA spending driven by state economic conditions in 2009-10 and, hence, subject to reverse-causation problem. Wilson (2012) covers all state spending under ARRA except that by Department of Labor, notably unemployment insurance. Chodorow-Reich (2012) examines only outlays under Medicaid.

- Main finding from both studies: added ARRA spending in state led to increase in state's total employment in 2009-10. Hence, implied spending multipliers (not quantified) positive.
- As with Nakamura & Steinsson (2012), evidence relates to state spending financed by other states and, therefore, nearly free.
- Also, unclear whether patterns of state employment growth in 2009-10—essentially 1 year of observations across states—depend directly on factors used to predict ARRA spending (highway miles, prior Medicaid population), rather than ARRA spending, per se.

Shoag (2011)

- Uses differential performances of states' pension-fund investments to generate exogenous shocks to state government spending.
- Gets large estimated spending multipliers from these changes. But there is a state wealth effect that also operates?

New Deal Spending

- Currently working with Price Fishback to estimate effects on state incomes from New Deal spending programs of 1930s. For example, public works & agriculture spending varied across states in ways predictable from history. Estimation method analogous to Nakamura & Steinsson (2012).
- Estimated multipliers look small but problems in data and estimation.

Simulated Effects of 2009-10 Stimulus Package

- U.S. government spent roughly \$300 billion (2.1% of GDP) extra in each of 2009 and 2010. Assume macro effects can be gauged by empirical estimates of defense-spending multipliers.
- Since stimulus spending largely deficit financed, use spending multiplier of 0.4 within current year and 0.6 over 2 years.
- Estimate GDP boosted by \$120 billion in 2009 and \$180 billion in 2010 (0.9% and 1.2% of GDP). Since multipliers less than 1, heightened public outlay reduces private parts of GDP, notably private domestic investment and personal consumer expenditure.
- Short-term deal pretty good, because added public outlays of \$600 billion over 2 years come at cost of \$300 billion in private spending; that is, 50 cents on the dollar.

- Other part of story is that the public debt increased by more than \$600 billion. This debt has to be paid for sometime by raising taxes (if government spending does not change after going back down by \$300 billion).
- Considered before example in which taxes rose by \$300 billion in 2011 and 2012 and then reverted to initial level. Counter-factual, but critical point is that taxes have to rise some time.

Tax Multipliers

- Existing estimates of “tax multipliers” used to get full effects of stimulus package on path of real GDP.
- Findings of Romer & Romer (2010) and Barro & Redlick (2011) suggest tax multipliers with one-year lag around -1.1; that is, GDP falls next year by \$1.10 for each increase in federal taxes by \$1.

- Path of incremental government outlays in billions of dollars over 5 years: +300, +300, 0, 0, 0, which adds to +600.
- Path of estimated effects on real GDP: +120, +180, +60, -330, -330, adding to -300. Real GDP falls overall because “balanced-budget multiplier” negative—government-spending multiplier between 0.4 and 0.6 and tax multiplier -1.1.
- Effects on private parts of GDP: -180, -120, +60, -330, -330, which sums to -900.
- Over 5 years, stimulus package of 2009 was a way to get extra \$600 billion of public spending at cost of \$900 billion in private spending—probably not attractive deal.

Cutbacks in Defense Spending from Sequestration

- Treat sequester as cut, starting 2013, by 5% in defense outlays and 5% in other federal spending. Consider here only effects on real GDP from defense-spending cuts.
- Since defense spending in 2012 was \$809 billion, 5% cut implies reduced outlay by \$40 billion per year, starting 2013.

- Cut in defense spending lowers federal deficit; hence, public debt lower than otherwise. Implies taxes decrease correspondingly compared to benchmark path.
- Can make various assumptions about timing of decreases in taxes. Assume federal taxes decline by \$40 billion per year starting 2013, paralleling reductions in defense outlays. Similar long-run conclusions if lower taxes delayed.

- As before, defense-spending multiplier 0.4 within year, 0.6 over 2 years. Tax multiplier -1.1, 1-year lag.
- Assumptions imply that real GDP falls compared to benchmark path by \$16 billion in 2013 (because of spending multiplier), rises by \$20 billion in 2014 (because tax multiplier more than offsets spending effect).
- Private parts of GDP rise by \$24 billion in 2013 (60 cents on dollar compared to spending cut) and \$60 billion in 2014 (because GDP now above benchmark).

- Effect of +\$20 billion on real GDP continues into each future year. Over 5 years (out to 2017), overall effect is reduction in defense spending by \$200 billion, cut in taxes by \$200 billion, increase in real GDP by \$64 billion, rise in private parts of GDP by \$244 billion.
- Thus, over 5 years, get roughly \$1.20 of extra private spending for each \$1 less in defense spending.
- Whether this exchange is good deal depends on how much society values defense spending as contributor to national security. It is this kind of economic and political calculation—not mystery of Keynesian economics—that dictates how large defense budget and other parts of government spending should be.

- Conclusions consistent with historical pattern in which U.S. economy responded well to much larger defense cuts. Particularly compelling is strong economic performance after massive post-WWII demobilization.
- Similar pattern for more recent defense cuts. From 1987 to 2000, under first-Bush and Clinton administrations, share of defense spending in GDP fell from 7.4% to 3.7%.
- Average growth rate of real GDP over period was 3.3% per year, despite 1991 recession.

Fiscal Uncertainty

- Did not consider added uncertainty about how large fiscal deficits, growing ratio of public debt to GDP will be resolved.
- Will it be lower spending—especially on entitlements?
- Will it be higher taxes—on what?

- Will it be high inflation? (Related to monetary policies.)
- In some countries, will it be confiscation of deposits, defaults on public debt?
- Various uncertainties tend to depress investment and retard economic recovery.

Transfer Programs

- Did not consider effects from expansion of U.S. transfer programs—unemployment insurance, food stamps, Medicaid, disability.
- Likely relates to sharp rise in share of unemployment that is long term.
- Likely relates to sharp drop in labor-force participation rate.