Government Spending Multipliers in Good Times and in Bad: Evidence from U.S. Historical Data Valerie A. Ramey and Sarah Zubairy (2014)

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May 31, 2015

Motivation

Are fiscal multiplies state-dependent?

1. Multipliers are estimated to be modest (typically 0.6 to 1) but textbook models predict multipliers are lager during recessions or at the ZLB.

2. There is a recent and growing literature examining whether fiscal multipliers are larger in periods of slack. Several papers find that multipliers are lower than one, often close to 0, during expansions, and greater than 1, sometimes as high as 2 or 3, for periods of slack.

3. Fewer papers look at whether multipliers are larger at the ZLB, but there is also some evidence to that effect.

This paper, however, finds little evidence that multipliers are larger during periods of slack of at the ZLB.

Specification

This paper stands out in the literature because

1. The literature typically uses VARs. They use local linear projections following Jorda (2005).
   - Estimating state-dependent systems is straightforward using Jorda's method. Using VARs is not trivial and fraught with complications.
   - Auerbach and Gorodnichenko (2012), however, estimate a state-dependent STVAR model using Bayesian methods (MCMC) and find multipliers are larger during recessions. Auerbach and Gorodnichenko (2013) also find such evidence this time using Jorda's method.
   - RZ devote a lot of time into explaining these differences.

Specification

② Another issue arises when the multiplier is estimated using impulse responses.

- Many follow Blanchard and Perotti (2002) in estimating the multiplier as the peak response of Y to a unit-shock to G. Others compute the average IRF.
- RZ argue that it is more appropriate to compare the *integral* of the IR of Y to the integral of the IR of G because this way we measure the cumulative response of GDP to cumulative increases in G.
- Here they emphasize that computing the response $(z_{t+h} - z_{t-1})/Y_{t-1}$ for $z = \{Y_t, G_t\}$ can be done directly using linear projections.

Specification

3. Often the literature estimates an *elasticity* (variables in logs) and converts it to a multiplier by multiplying by average GDP to government spending ratio for their sample, Y/G.
   - RZ argue this can result is heavily biased multipliers.
   - They estimate the multiplier directly as their variables are $\Delta Y_t/Y_{t-1}$ and $\Delta G_t/Y_{t-1}$.

The specification for I_{t-1} a dummy for a period of slack, is

$$
z_{t+h} = I_{t-1} \left[\alpha_{Ah} + \psi_{Ah}(L)y_{t-1} + \beta_{Ah}\frac{shock_t}{Y_{t-1}} \right]
$$
$$
+ (1 - I_{t-1}) \left[\alpha_{Bh} + \psi_{Bh}(L)y_{t-1} + \beta_{Bh}\frac{shock_t}{Y_{t-1}} \right]
$$
$$
+ \textit{quartic trend} + \varepsilon_t
$$

For a state $k = \{A, B\}$, the multiplier is

$$
\textit{Multiplier}_H^k = \frac{\sum_{h=1}^H \beta_{k,h}^Y}{\sum_{h=1}^H \beta_{k,h}^G}
$$

Relation to ORZ (2013)

Ramey and Zubairy (2014) is closely related to Owyang, Ramey, Zubairy (2013), who use nearly the same sample period to answer whether the fiscal multiplier is greater in periods of slack. The differences seem to be:

1. More extensive robustness checks.
2. A discussion of why the results differ from AG (2012, 2013).
3. Analysis of ZLB.
4. Additional years of data (up to 2013 instead of 2010).

Otherwise they appear identical (also use unemployment as measure of slack and the news variable in Ramey's 2011 as shock). AZ (2014) reach the same conclusion as ORZ (2013) for the US. We use the data-set from the latter paper, which is readily available.

Compared to Auerbach and Gorodnichenko

The following summarizes the differences in estimates.

Authors	Data	Method	Recession	Expansion
RZ (2014)	US	Jorda. Direct.	0.69 to 0.76	0.76 to 0.96
AG (2013)	OECD	Jorda. Direct.	3.27 to 6.69	-2.59 to 1.20
AG (2012)	US	STVAR. Elasticity.	1 to 1.5	0 to 0.5
AG (2011)	OECD	Jorda. Elasticity.	$0.49 \to 2.36$	$-0.19 \to -1.024$
AG (2014)	Japan	Jorda. Elasticity.	2.52 to 2.80.	Imprecise

Robustness to WWII - Ramey's news variable vs Random Noise

RZ claim their results are robust to WWII. However, this is an odd claim. Ramey's news variable has little explanatory power if this is excluded, especially for the economy in periods of slack. In fact, it is as good as random noise in predicting government expenditures for periods of slack outside of WWII.

Robustness to WWII - Ramey's news variable vs Random Noise

This should not be surprising. The authors themselves note a similar irregularity, and Ramey (2011) actually shows that her news variable has little explanatory power for the period 1955:Q1 onward (F-statistic close to 0 compared to one well-above 10 including data back to 1939:Q1).

Robustness to WWII - Excluding WWII

I cannot replicate their claim that their estimates are robust to excluding WWII, or to excluding rationing years within WWII. I try both the historical WWII dates and 1939 to 1947. Clearly the following shows that the estimates are sensitive to excluding WWII.

Both the recession and expansion estimates increase, though the former much more dramatically.

Robustness to WWII - Explanation

This jump is not so surprising when we look at the time series

The biggest increase in governemnt expenditures occurs right when unemployment goes below their recession threshold.

Robustness to WWII - Restricted Samples

If the authors restrict their sample from 1947 to the present, and their estimates become very imprecise. Note, however, that thee estimate for the period *up to* 1947 do not change so dramatically.

Robustness to WWII - Restricted Samples

The same occurs if the sample is restricted to 1955 to the latest date (excluding the Korean war in addition). The difference is even more striking.

Conclusion

RZ contribute to the literature estimating state-dependent multipliers. In contrast to prior work, they find that fiscal multipliers do not differ across states, for both recessions in contrast to expansions and for the interest rate near the ZLB or near a Taylor rule.

1. The estimates are mainly driven by WWII, and perhaps Korea.

2. They do note the long-time series allows them to account for such events, but perhaps the period pre and post this major historical event can be thought of as different periods.

3. There is also potentially an issue with Ramey's news variable, in that it has very low predictive power outside WWII (at best it has predictive power for 1939 to 1955).

4. One approach might be to estimate a time-varying multiplier directly, or to allow for time-breaks in their estimation given they such a long series.