# "Government Spending Multipliers under the Zero Lower Bound"

## by Wataru Miyamoto, Thuy Lan Nguyen, and Dmitriy Sergeyev

Discussion by

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NBER Japan Project, Tokyo, July 31, 2017

# Contributions of this paper

- Studies government spending multipliers in the most famous ZLB episode of the modern era – Japan 1995 through the present.

- Estimates significantly higher multipliers during the ZLB.

- Meticulous data work and estimation.

- Great paper that makes a significant contribution to the fiscal literature.

# Summary of Results

- Miyamoto-Nguyen-Sergeyev headline estimates

| | Normal | ZLB | P-value for diff HAC (AR) |
|---|---|---|---|
| Impact | 0.61 (0.23) | 1.54 (0.43) | 0.02 (0.09) |
| 4 quarter | 0.12 (0.58) | **2.67** (1.11) | 0.00 (0.06) |
| 8 quarter | -0.56 (0.34) | 1.70 (0.94) | 0.00 (0.08) |

- Ramey-Zubairy 8 qtr multipliers:

  - full historical sample:  < 1 for military news and BP.
  - excluding WWII rationing: 1.4 (s.e. 0.15) to 1.6 (s.e. 0.5).

# Summary of Results

- Results are robust to numerous changes in the specification.


- They present a calibrated NK model and argue that the results are more consistent with the ZLB being driven by confidence shocks.

Their results call into question the conventional wisdom about the effectiveness of fiscal stimulus packages in Japan.

# Abe's Fiscal Plan Follows a Long Road of Packages That Failed

Bloomberg News

By **Enda Curran** and **James Mayger**
July 31, 2016, 2:00 PM PDT

→ Multiple spending packages didn't have a lasting impact

→ True stimulus set to be much smaller than headline suggests

Prime Minister Shinzo Abe's "bold" plan to revive the economy with a $273 billion package leaves him traveling down a well-trod path: it marks the 26th dose of fiscal stimulus since the country's epic markets crash in 1990, in a warning for its effectiveness.
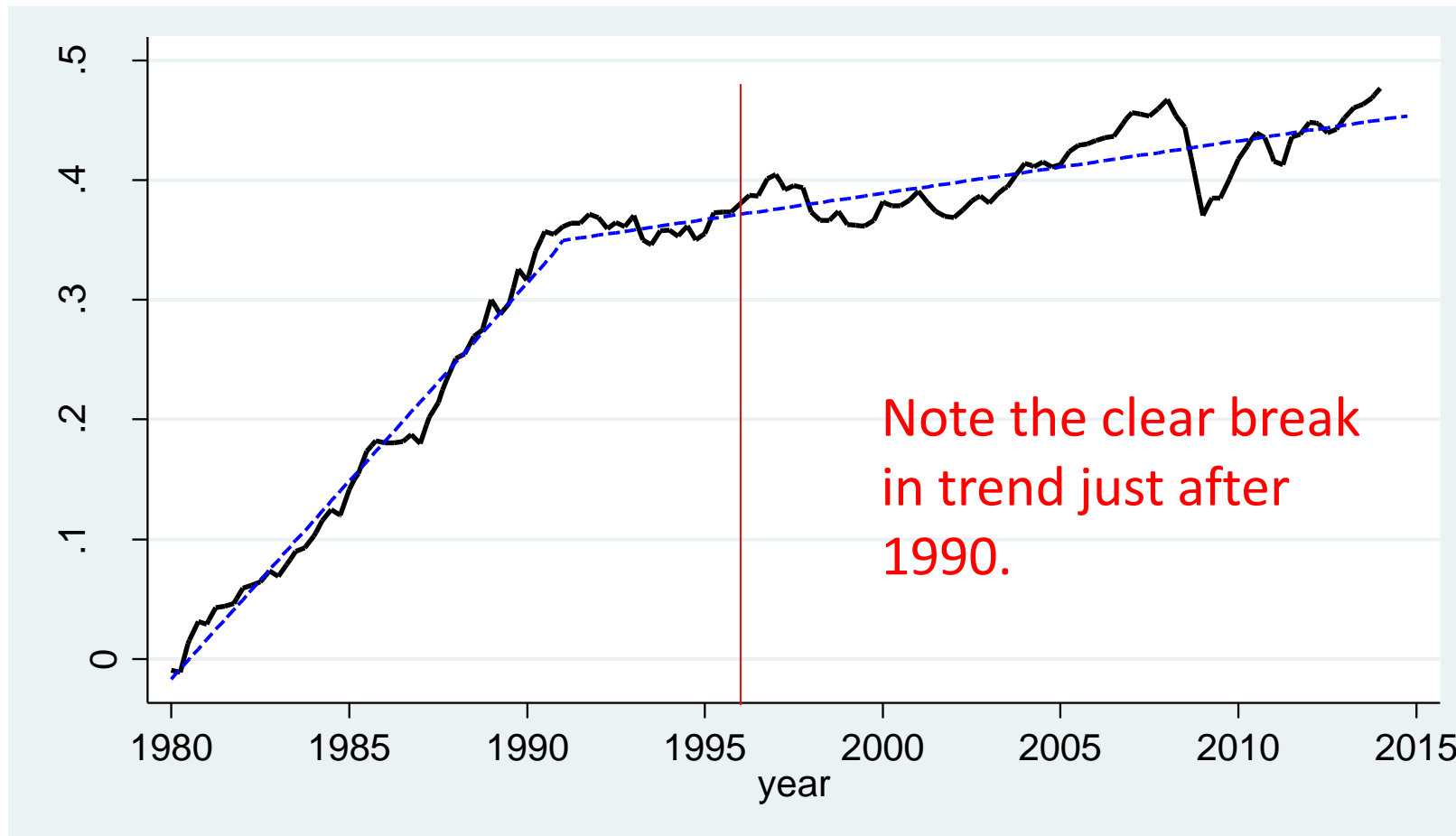
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# Outline of my discussion

1. **Assessing the empirical estimates**

   a.  **Data features: underlying trends**

   b.  **Exploration with alternative method and shocks.**

   c.  **Thoughts about the nature of the shocks.**

2. **Critique of the theoretical models of fiscal multipliers at the ZLB.**
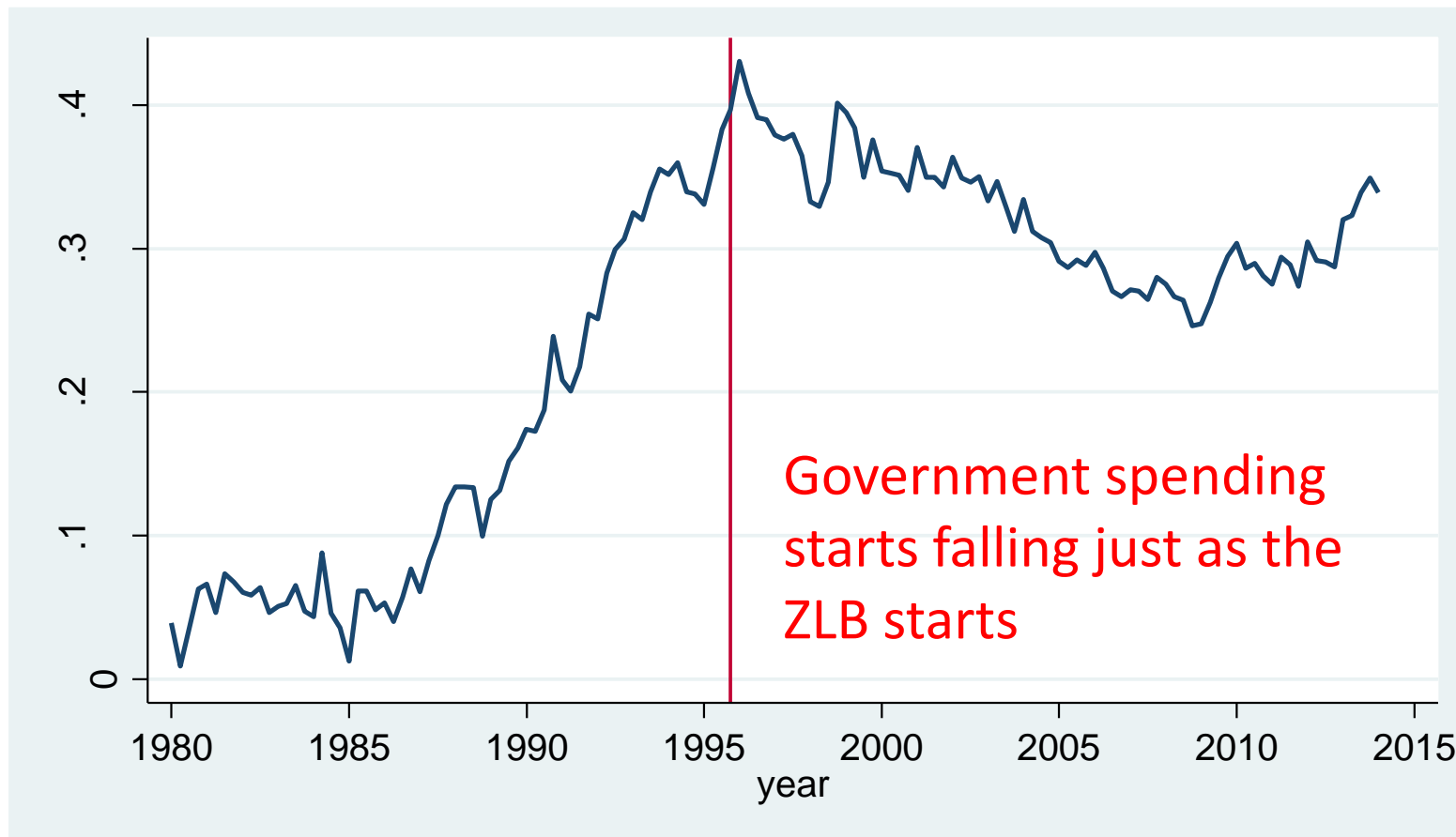
## a. Underlying trends

# Trends

## Log Real GDP Per Capita



Note the clear break in trend just after 1990.

**Log Real Government Spending Per Capita**



Government spending starts falling just as the ZLB starts

**b. Exploration with alternative method and shocks.**

# Details of MNS empirical work

- MNS method closely follows Owyang, Ramey, Zubairy (2013) and Ramey-Zubairy.  In particular:

    - Jorda local projection method.
    - - Hall-Barro-Redlick transformation of dependent variables. (But RZ(forthcoming) uses Gordon-Krenn.)
    - Calculates cumulative multipliers.
    - Uses the one-step IV method for calculating multiplier s.e.

- A few differences:

    - RZ use news of future G changes, MNS use Blanchard-Perotti augmented with survey forecasts.
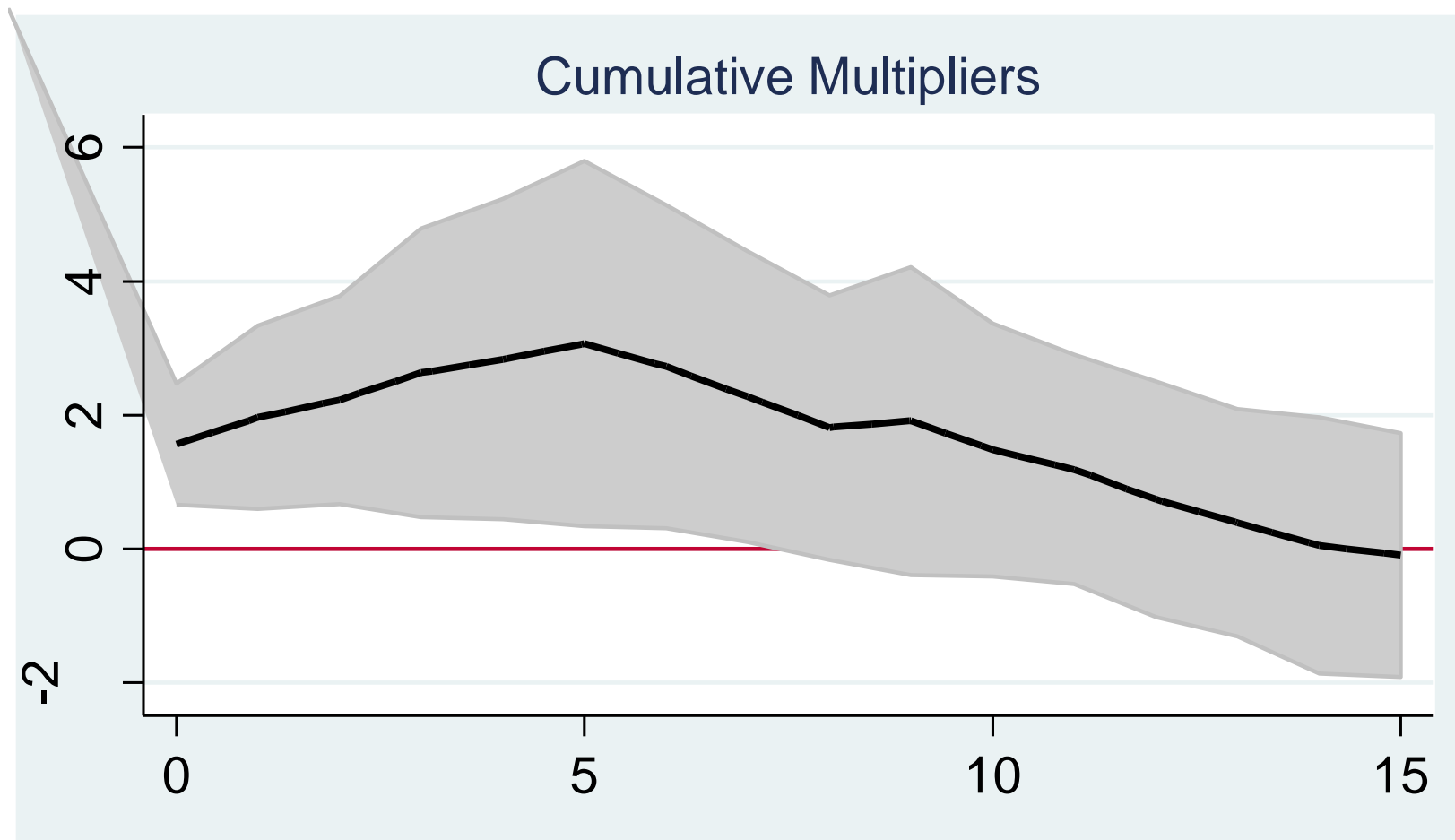    - MNS use first differences of  control variables.

# MNS Baseline Results using Jorda Specification, ZLB
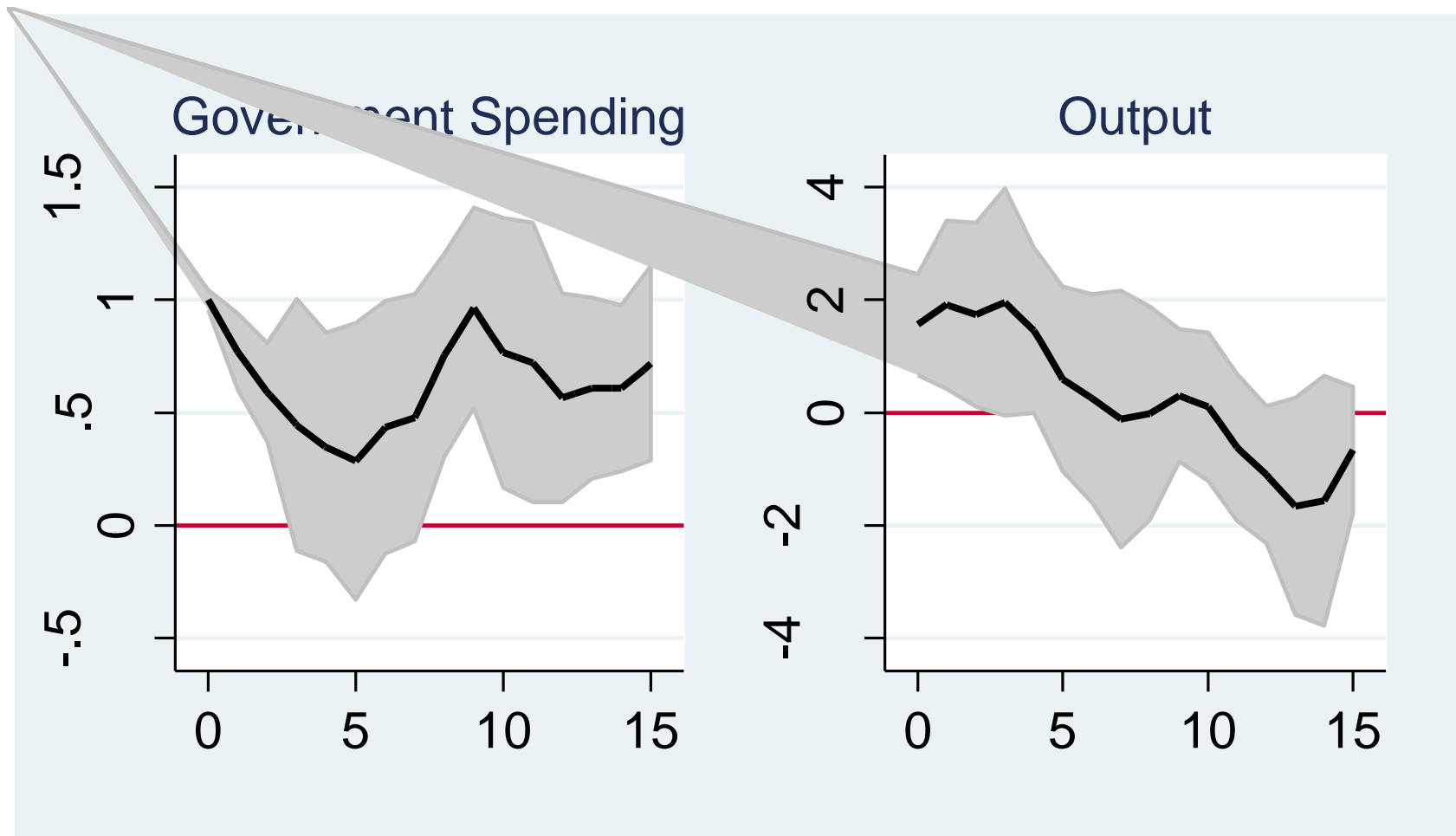


Note that response of government spending is permanent, but output rises only temporarily.

95% confidence intervals

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# MNS Baseline Results using Jorda Specification, ZLB



Cumulative Multipliers

95% confidence intervals

# Alternative transformations

- An alternative to the Hall-Barro-Redlick transformation is the <span style="color:red">Gordon-Krenn</span> (GK) transformation:

    X / trend Y

- MNS explore this, but still use the Jorda method.

- However, the GK transformation can also be embedded in an SVAR.

- Why an <span style="color:red">SVAR?</span>
    - The states are so long lasting that regime switching is not as important.
    - The estimates might be more precise.
    - Easier to do counterfactuals

# My SVAR specification

- Divide Y, G, and tax by the broken trend of GDP. (Leave unemployment rate in levels.)

- Include the government spending forecast as a variable, ordered first.

- Use 4 lags and same ZLB sample as MNS.

# SVAR, using Gordon-Krenn Transformation
## Shock to G during ZLB
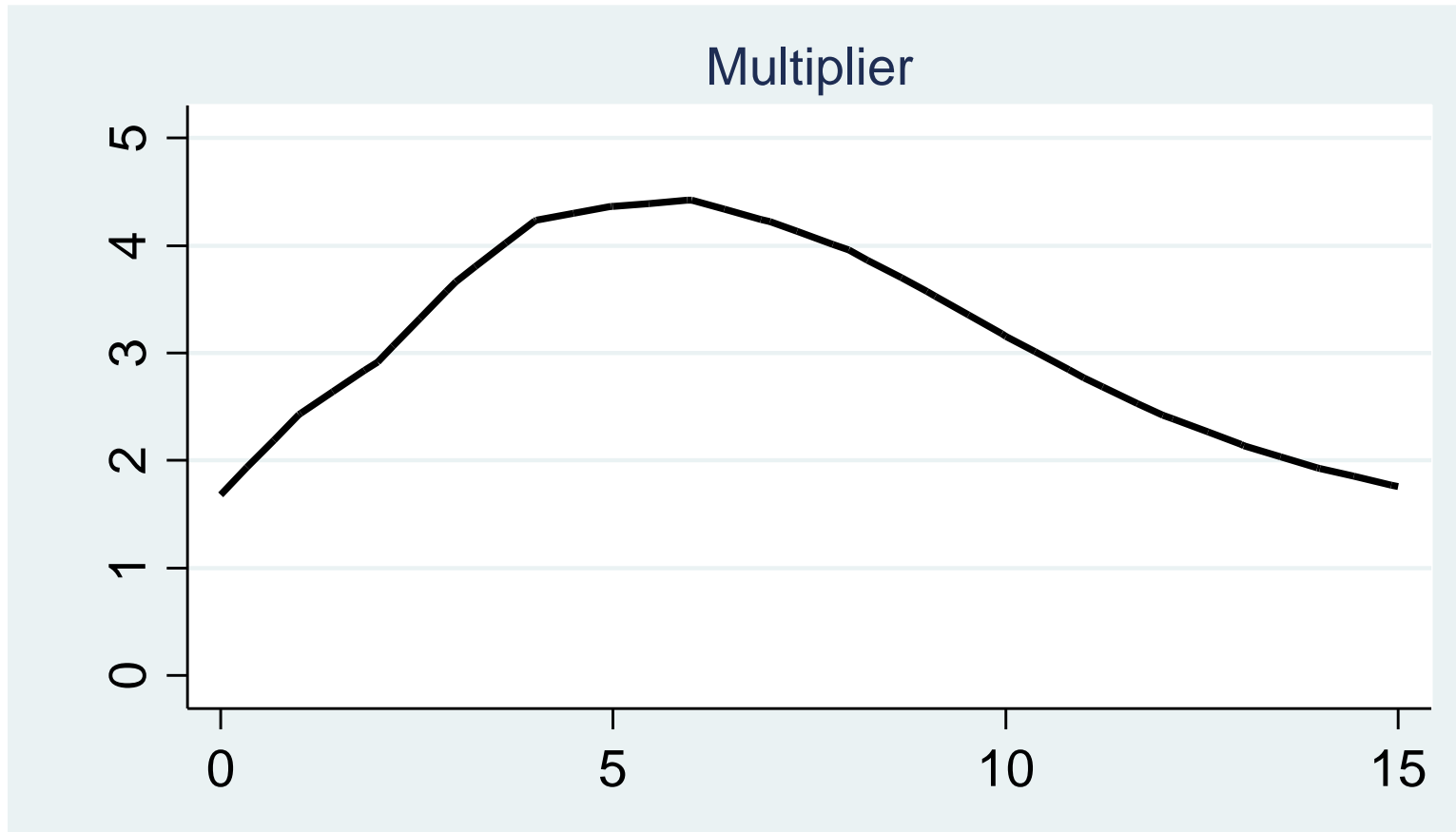


Government Spending

Output
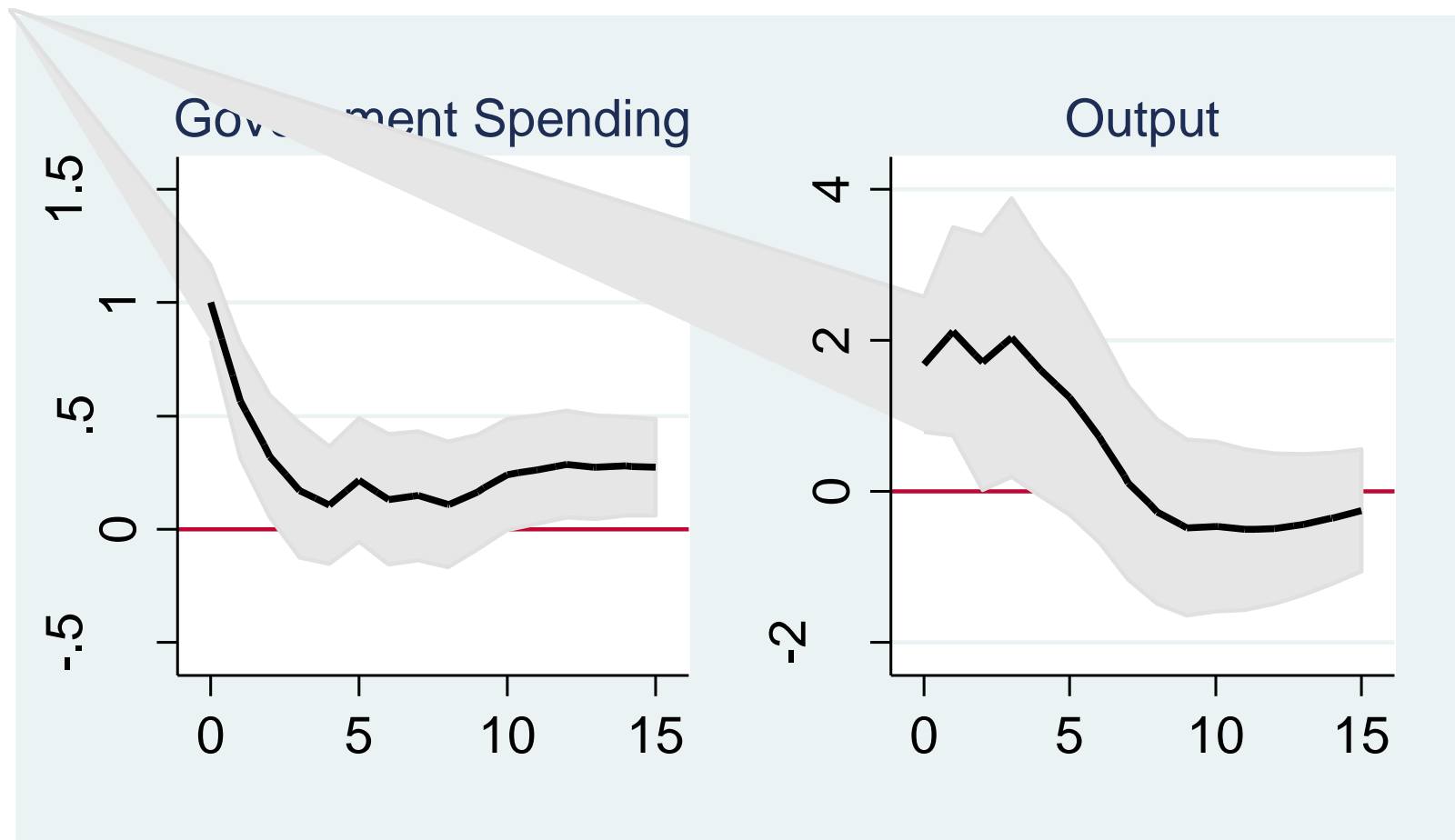
Note that G shock is less persistent in the ZLB than in the MNS Jorda specification

95% confidence intervals

# SVAR, using Gordon-Krenn Transformation Shock to G during ZLB



Multiplier

Cumulative multiplier peaks above 4!!!

# Summary of comparison

Switching from Jorda HBR transformed variables and first differences of controls to SVAR with GK transformed variables:

- raises the multiplier estimates for a G shock.

- changes the response of G from permanent to temporary.

- The MNS estimates are for a particular kind of shock:

    A surprise change in government spending that was not forecasted by the JCER (or by lagged values of G, Y, etc.)

- How important are these shocks?

# Comparison of Actual G and Y
# to Counterfactual with no G Shocks
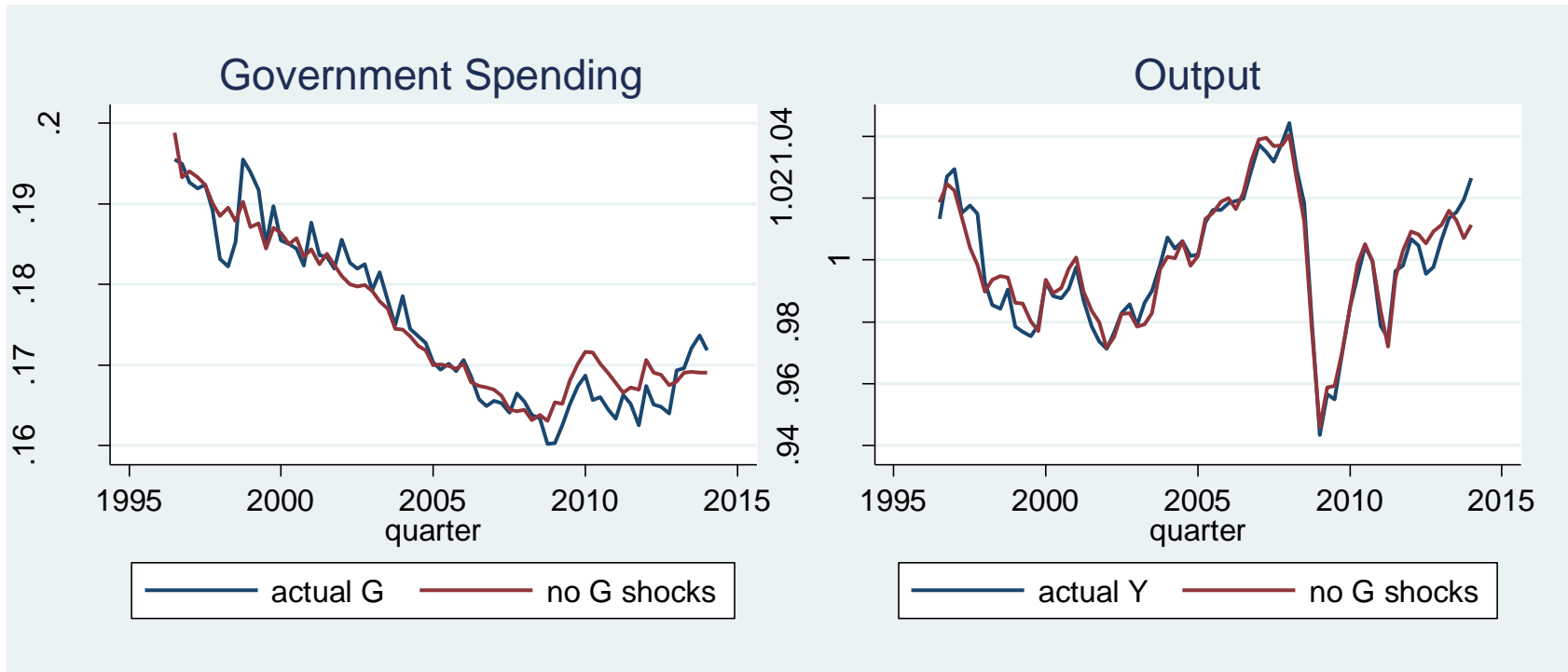
# But is this the multiplier most relevant to policy makers?

- Ideally, we want to know the multiplier on stimulus packages.

- But typical stimulus packages are announced in advance and followed by several quarters or years of increases in government spending.

- It seems that we want to measure the shock as the news.

- Use my same SVAR set-up with the GK transformed variables and the forecasts.

- To capture the effect of <span style="color:red">news</span> about a stimulus package, I use <span style="color:red">shocks to the forecast</span> not G itself as they do.

- I would prefer to have longer-run forecasts of G.
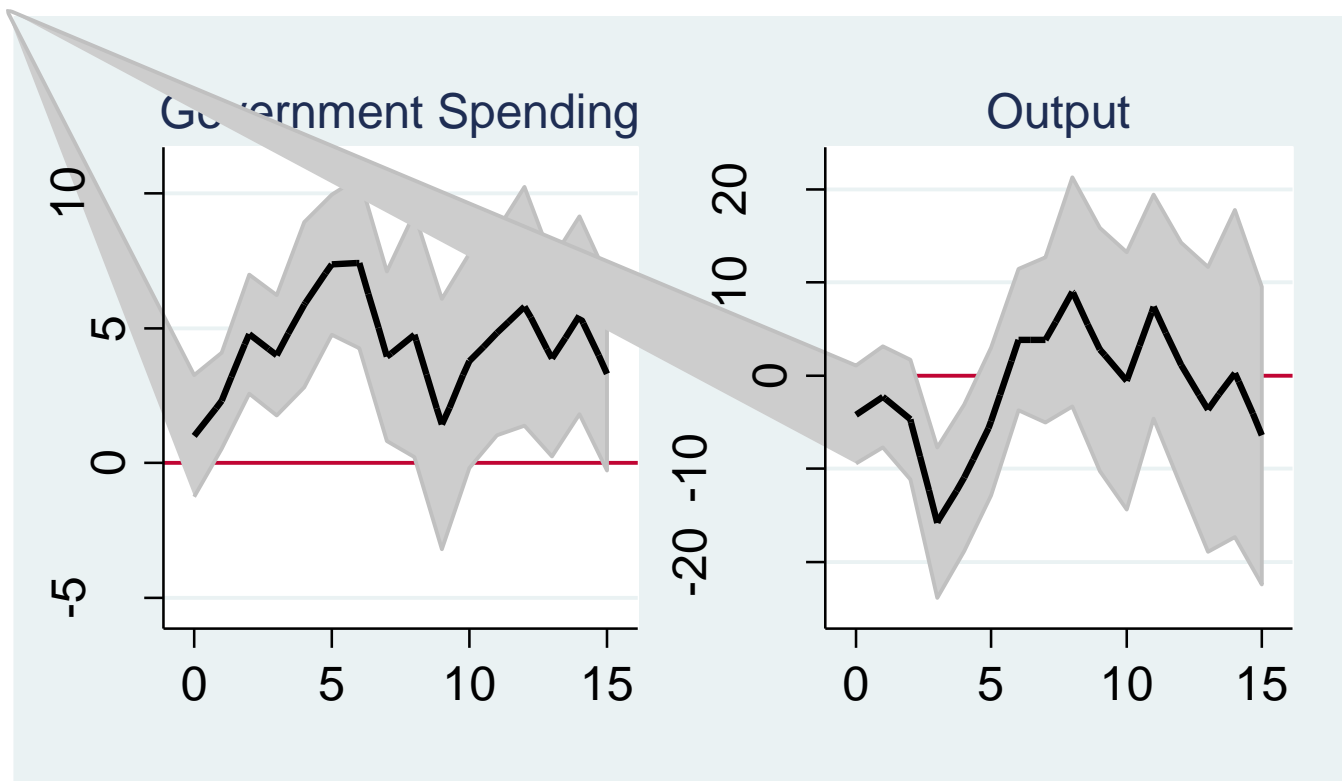
# SVAR, using Gordon-Krenn Transformation
## Shock to Forecast of G during ZLB



Government Spending          Output
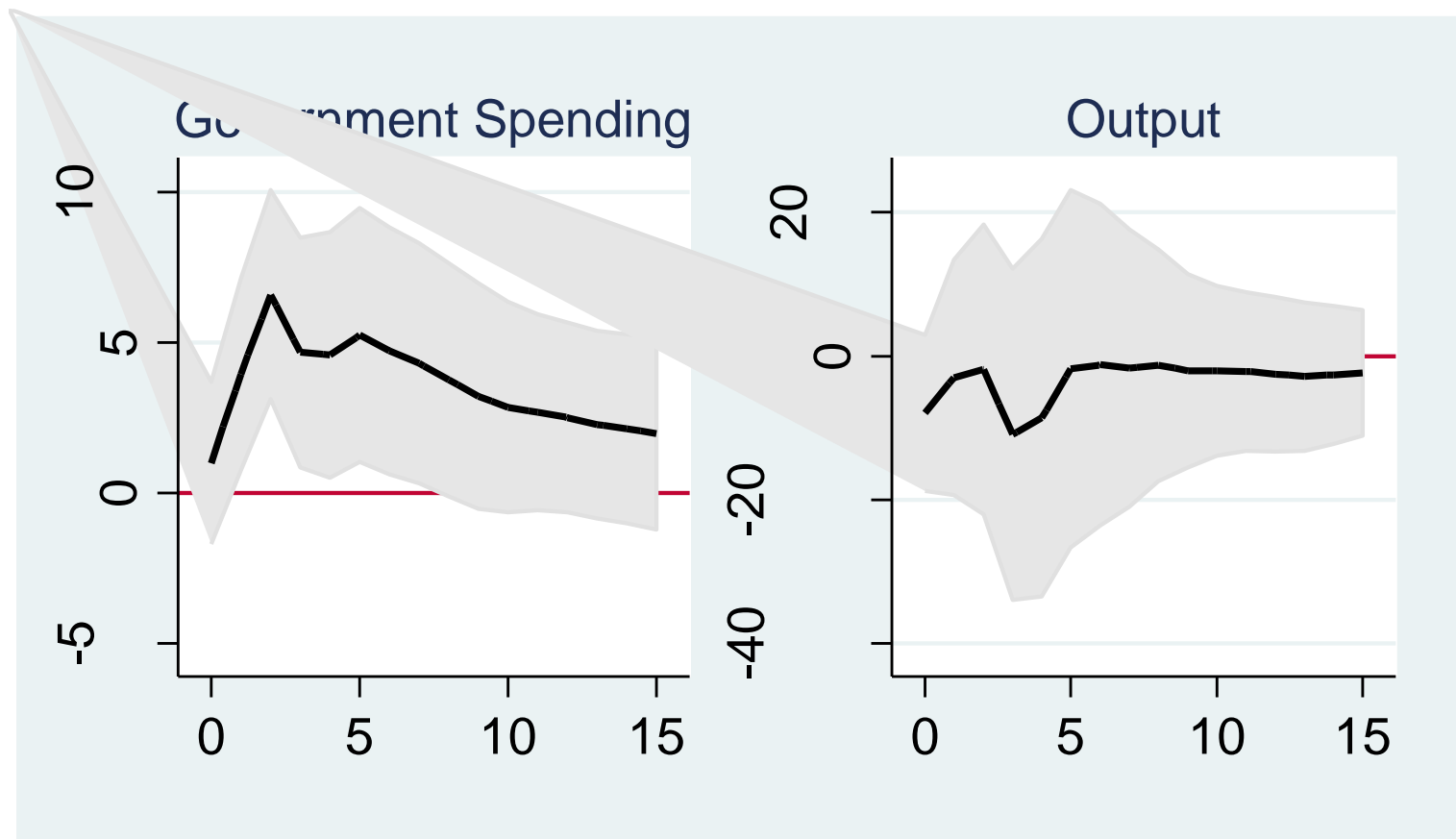
The behavior of G looks a lot like Ramey (2011) and Ramey-Zubairy.  Output doesn't respond, multiplier is 0 or negative.

# MNS Jorda Specification
## Shock to Forecast of G during ZLB



Thus, I get the same result using MNS Jorda specification.

# How to do this experiment correctly

- Do for Japan's fiscal packages what Romer and Romer (AER 2004) did for monetary policy.

  - RR combined Greenbook forecasts and narrative methods to estimate shocks to a monetary policy rule.

  - Cochrane's discussion of their paper talks about the benefits of this method.

- Exporting this to the Japanese fiscal situation:

- Use narrative methods to identify fiscal packages.
- Estimate a fiscal package adoption rule, regressing intended packages on the government's forecasts of future output growth and inflation.

# Summary of empirical assessment

- If anything, MNS underestimate the multiplier during the ZLB based on unanticipated government spending shocks.

- But these are not necessarily the policy-relevant shocks (unless the Japanese government suddenly decides to conduct fiscal stimulus using surprise changes in government spending).

- My quick-and-dirty alternative news method suggests very low multipliers.

# Theoretical Models

- The initial papers (Eggertsson, Woodford, Christiano et al.) found that government spending multipliers could be much bigger at the ZLB as long as the ZLB was persistent.

- However, some other papers have found the opposite result.

- Some argue that it matters whether ZLB is caused by a fundamentals shock or a confidence shock.

- Thus, this paper and my paper attempted to estimate the multipliers at the zlb.

# Johannes Wieland (2017)

- He has discovered that the differences across studies stem from their changing the persistence of government spending in their experiments and that the conclusions they reached about the importance of the persistence of the ZLB or the source of the shocks are mostly wrong.

- "..the size of the output gap and the persistence of the zero lower bound have relatively little impact on the constant nominal interest rate fiscal multiplier. Previous work has reached a different conclusion because it simultaneously changed the size or duration of the zero lower bound experiment along with the persistence of the fiscal experiment."
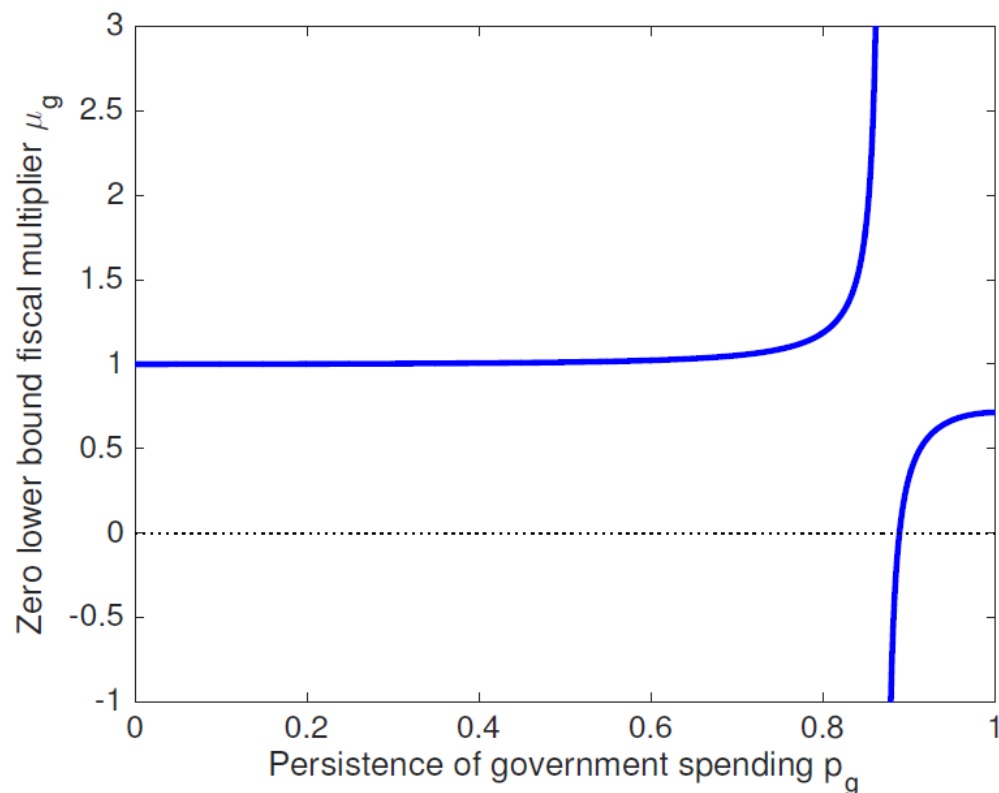
Figure 2 – Zero Lower Bound Fiscal Multipliers as a Function of Zero Lower Bound Persistence (nonlinear model)
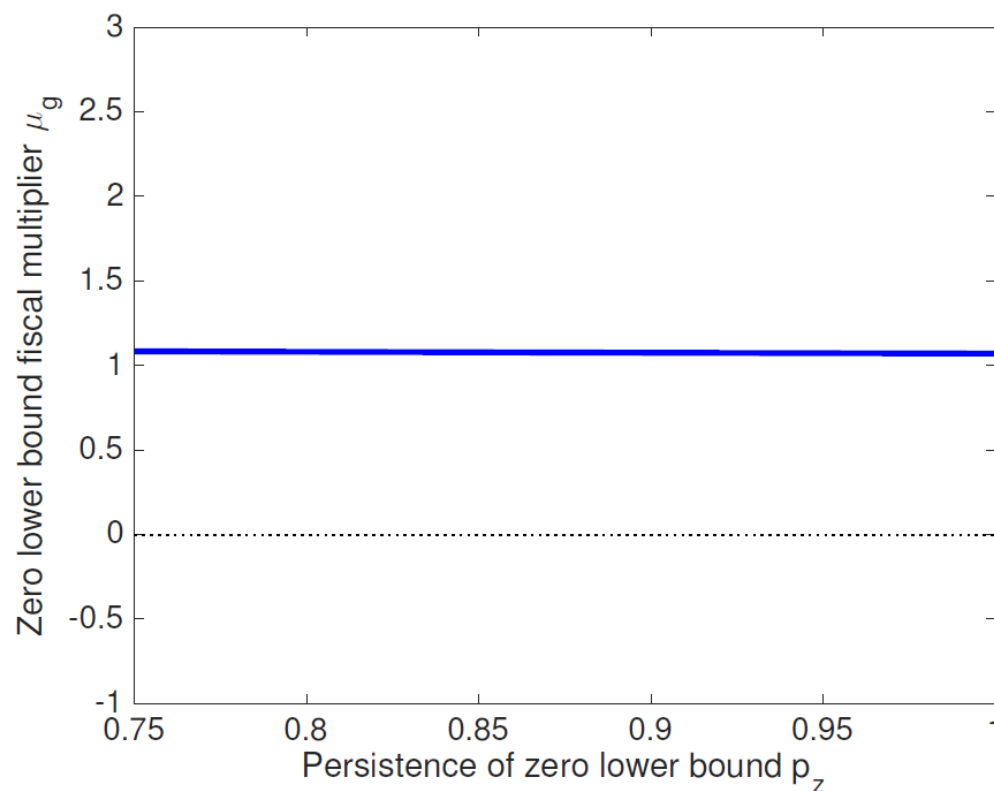


Contrary to what the literature asserted, the persistence of the ZLB makes no difference!

Figure 1 – Zero Lower Bound Fiscal Multipliers as a Function of Fiscal Persistence

Note that the multiplier is 1 is less for almost all regions of the parameter space!

# Concluding thoughts

- Really good paper, important results.

- The relevance of these shocks to policy requires more study.

- I would like to see a follow-up paper that studies the effects of policies that are announced in advance.