Government Spending News Shocks

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1 Introduction

The seminal paper of Ramey (2011b) asserted that government spending shocks identified by the popular VAR framework, such as that of Blanchard and Perotti (2002), can be anticipated and that this can lead to a spurious result on the effects of fiscal policy. To address this issue, Ramey (2011b) constructed government spending news variables and introduced them into the standard VAR model. Ramey (2011b) found that the effects of government spending news shocks are substantially different from those of government spending shocks in the standard VAR model without a news variable (for example, Blanchard and Perotti (2002); Gali et al. (2007)). In particular, consumption and real wage fall and the government spending multiplier is low, contrary to the results in the standard VAR model. Ramey (2011b) suggested that such results support the neoclassical view and that the timing issue is important in explaining why a narrative approach, such as that of Ramey and Shapiro (1998), often found negative effects on consumption and real wage.

Following Ramey and Shapiro (1998) and Ramey (2011b), subsequent studies on the effects of fiscal policy introduced news variables in the standard model, for example, Edelberg et al. (1999); Burnside et al. (2004); Caldara and Kamps (2008); Monacelli et al. (2010); Tenhofen and Wolff (2010); Barro and Redlick (2011); Perotti (2011); Rossi and Zubairy (2011); Auerbach and Gorodnichenko (2012, 2013); Bachmann and Sims (2012); Born et al. (2013); Ben Zeev and Pappa (2014); Forni and Gambetti (2014) and Caggiano et al. (2015) among many others. However, even these subsequent studies found controversial results on the effects of government spending shocks. For example, using Ramey and Shapiro (1998) war date dummy, found consumption falls in response to government spending shocks, while Caldara and Kamps (2008) and Monacelli et al. (2010) showed a positive response of consumption and real wage. Employing measures in Ramey (2011b), decreases in consumption and real wage were reported by Corsetti et al. (2012) and Tenhofen and Wolff (2010), while Ben Zeev and Pappa (2014) showed increases in consumption and real wage.

With close examination of Ramey (2011b)s results, we find that the results are somewhat
different under the two methods used by Ramey (2011b). Ramey (2011b) constructed news variables in two ways. First, for the period including WW II and the Korean War, an estimate of changes in the expected present value of government spending was constructed based on Business Week and other newspaper sources. Second, for the post-Korean War period, forecast errors of changes in government spending were constructed based on the Survey of Professional Forecasters (SPF). We find that there are differences in the response to government spending and in the key variables, such as GDP, hours, consumption, and real wage, in the VAR with the two measures in Ramey (2011b).

We suggest that the empirical results are inconsistent because the government spending shocks identified under the two methods are different in nature. Only the first method makes sense because it takes account of anticipated future changes in government spending. Shocks to forecast errors of changes in government spending are not likely to capture expected future changes in government spending, which is important in evaluating theory. Our results are in line with those of Perotti (2011); Forni and Gambetti (2014); Caggiano et al. (2015). Perotti (2011) points out that factors, such as the sample period including 2008, the composition, and the explanation power of forecast error, may be problematic. Forni and Gambetti (2014) and Caggiano et al. (2015) claim that Ramey (2011b)’s SPF forecast error shocks may not be appropriate to estimate the news shock of government spending based on the amount of information; this is supported by the test results that their news measures can expect a forecast error in Ramey (2011b).\(^1\)

As a contribution to the existing literature, we suggest that a part of the controversy in the literature may be explained by the difference in the nature of the shocks identified by Ramey (2011b). We show evidence of inconsistency in the results in Ramey (2011b); we also explain the mixed results in follow-ups in Ramey (2011b). Moreover, we study the effects of the news shock by constructing changes in the expected present value of changes

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1Also, Caggiano et al. (2015) and Forni and Gambetti (2014) focused on the estimation of news shock by employing their own measures in different set ups, rather matching their results with the first measures of Ramey (2011b).
in government spending based on the SPF data, as in the first method. With this modified method, we investigate the effects of anticipated government spending shocks and discuss whether the empirical results are consistent with the neoclassical view.

The rest of the paper is organized as follows. Section 2 explains two methodologies of Ramey (2011b) and discusses the nature of shocks identified in each method. Section 3 suggests a modified methodology and shows the empirical results based on these modifications. Section 4 shows the robustness of the empirical results, and Section 5 concludes with a summary of the findings.

2 Ramey (2011b)s Models with Government Spending News Variables

2.1 Two Empirical Models in Ramey (2011b)

Ramey (2011b) suggested that conventional VAR models with government spending fail to identify government spending shocks properly, because changes in government spending are often anticipated before actual changes are implemented. Therefore, Ramey (2011b) constructed expectation measures incorporating news about future changes in government spending. Ramey (2011b) used two different ways.

First, an estimate of changes in the expected present value of government (defense) spending is constructed by using Business Week and other newspaper sources. Based on these sources, Ramey (2011b) built the narrative data of changes in public expectations, and then constructed the measure of the changes in expected discounted value of government spending from 1939:1 to 2008:4. The changes in present discount value is employed to test the predictions of wealth effect from the neoclassical models. After the news about increases in government spending arrives, agents can have revision about future level of government
spending and adjust their behavior accordingly.

\[ f_t^{\text{news}} = \sum_{j=1}^{\infty} \frac{1}{r_{t+j}} (f_{t+j}^e - f_{t+j|t-1}^e) \]  

(1)

This measure (or the defense news variable) was added to the conventional VAR model that includes the log of real per capita government spending, the log of real per capita GDP, the three-month T-bill rate, the Barro-Redlick average marginal income tax rate, and an additional variable of interests such as total hours, the manufacturing product wage, the real BAA bond rate, the three components of consumer expenditures, nonresidential investment and residential investment. In the model, the news variable is assumed to be contemporaneously exogenous to all other variables in the model. Then, the effects of shocks to the news variable are examined.

However, as discussed in Ramey (2011b), the first news series has its most of the explanatory power for the period of WW II and the Korean war, so the results may become different for the periods after wartime. Hence, Ramey (2011b) built an alternative measure for the recent period by using SPF data. To construct news series covering the period after the Korean war, she constructed the second news variable as a consecutive series of forecast errors of defense and federal spending. Specifically, since SPF forecasts for real federal government spending are available only from 1981:3, she extended the sample span by using forecasts of nominal defense spending from 1968:4 to 1981:2.\(^2\) The measure is calculated as the growth rate of forecast errors of real defense and federal spending by the difference between actual government growth rate and forecast growth rate. By combining two forecast error series, the second news variable covers from 1968:4 to 2008:4.

\[ f_t^{FE} = \Delta f_t - \Delta f_{t|t-1}^e \]  

(2)

Then, this new variable was again added to the conventional VAR model. As before, this

\(^2\)This series is converted into real value by using GDP deflator
news variable is assumed to be contemporaneously exogenous to all other variables and the
effects of the shocks to the series are investigated. Although it is unclear from the discussion
in Ramey (2011b) as Ramey (2011b) called both variables news variables, the nature of
shocks identified in two models are clearly different, besides the differences in data sources. In
the first model, shocks to news or expectation on future changes in government spending are
identified by using changes in the expected present value of government (defense) spending.
However, shocks to unexpected changes in government spending are identified in the second
model, by using forecast errors of government spending.

Ramey (2011b) emphasized that a proper measure should incorporate news about future
changes in government spending since changes in government spending are often anticipated
before actual changes are implemented. In the first model, the identified shocks include
news about future government spending changes. However, in the second model, a different
nature of shock is identified since unexpected shocks to government spending are identified
by using forecast errors. It is not clear whether unexpected shocks to government spending
can include news about future government spending changes. From now on, we indicate the
first model as the model with defense news and the second model as the model with SPF
FE (forecast error).

2.2 Empirical Results from Two Models

We reproduce the results from the two models of Ramey (2011b). Following Ramey
(2011b), we estimate six-variate VAR; \( x_t = [\text{News}_t, g_t, y_t, r_t, \tau_t, h_t] \) where \( \text{News}_t, g_t, y_t, r_t, \tau_t \) and \( h_t \) are the news variable, log of real per capita government spending, the log of real
per capita GDP, the three-month T-bill rate, the Barro-Redlick average marginal income
tax rate and a variable of interests. To avoid including too many variables in the model,
Ramey (2011b) used the first five variables as a fixed set and rotated the sixth variable as
the series of variables of interest, such as hours, real wage and consumption and investment
components. We follow this specification. A quadratic time trend and four lags are included
in the model.

Figure 1 and 2 report the results of the first model (or the model with defense news) and the second model (or the model with SPF FE), respectively. Because the identified shocks in two models are different in their natures, it is not surprising that the effects of two shocks are different in some cases. The government spending responses are quite different, which confirms the idea that the nature of two shocks are different. In the first model, government spending starts to increase only from the third quarter after the shock. Then, from the third quarter, government spending increases gradually over time, reaches to the peak in about two years, and then decreases back to the initial level in about four years. This is a likely response to shocks to news on future persistent increase in government spending. Since government spending is anticipated before actual changes, government spending increases only from the third quarter after the shock.

However, in the second model, government spending immediately increases and then decreases back to the initial level in the third quarter after the shock. Such responses are likely to be observed when there is a surprise shock of temporary changes in government spending. In particular, such a shock does not seem to capture news about future changes in government spending.

The inference on the effects of government spending shocks is also quite different in two models. First of all, the size of government spending multiplier is different. In the first model, the government spending multiplier tends to be positive, but it is often negative in the second model. Table 2 displays the government spending multipliers estimated in two VAR models. In the VAR with defense news, the cumulative multipliers rigidly exceed 1 during 5 years. The multiplier of max to max also exceeds 1. In the second VAR with the SPF FE, The multiplier of peak responses are close to 1. However, because GDP become negative after 2 quarters, the sign of multiplier is not meaningful and the gap between lower

\footnote{Our replication on multipliers are consistent with Ramey (2011b)s multipliers of the peaks. Ramey (2011b) reports only the multipliers of peaks and under integral without lower and upper bounds; the defense news multipliers are 1.1(peak) and 1.2(integral), the SPF FE multipliers are around 0.8(peak) and negative under integral.}
Figure 1: Ramey (2011b): Defense news from 1939:1-2008:4

The standard error bands for 68% and 95% are displayed.
Figure 2: Ramey (2011b): SPF forecast error from 1969:1-2008:4

The standard error bands for 68% and 95% are displayed.
<table>
<thead>
<tr>
<th></th>
<th>Identification</th>
<th>output multiplier</th>
<th>Consumption</th>
<th>Real wage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ramey and Shapiro (1998)</strong></td>
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<tr>
<td>war dates</td>
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<tr>
<td><strong>Ramey (2011b)</strong></td>
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<tr>
<td>Defense news</td>
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<tr>
<td><strong>Ramey (2011b)</strong></td>
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<td></td>
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<tr>
<td>SPF Forecast error</td>
<td></td>
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<td></td>
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</tbody>
</table>

Table 1: Literatures based on Ramey and Shapiro (1998) and Ramey (2011b)

Notes. The sign +, = , - denotes positive, insignificant, negative. NA means no results about the variable in the corresponding study.
Table 2: Cumulative GDP Multipliers

<table>
<thead>
<tr>
<th></th>
<th>Defense news</th>
<th>SPF Forecast error</th>
<th>Rebased SPF PV</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>1.17 (-4.3, 1.15)</td>
<td>-1.65 (-22.3, 1.59)</td>
<td>-54.2 (1.69, 9.68)</td>
</tr>
<tr>
<td>2 year</td>
<td>1.12 (1.11, 1.12)</td>
<td>-6.35 (20.26, 1.24)</td>
<td>54.25 (0.79, 9.14)</td>
</tr>
<tr>
<td>3 year</td>
<td>1.14 (1.19, 1.14)</td>
<td>-30.83 (9.04, 1.7)</td>
<td>12.92 (0.59, 6.57)</td>
</tr>
<tr>
<td>4 year</td>
<td>1.19 (1.46, 1.17)</td>
<td>15.7 (6.05, 2.79)*</td>
<td>6.85 (1.24, 4.97)</td>
</tr>
<tr>
<td>Max to Max</td>
<td>1.11 (1.09, 1.12)</td>
<td>0.97 (-0.01, 1.67)</td>
<td>4.64 (9.42, 4.87)</td>
</tr>
<tr>
<td>Integral</td>
<td>1.26 (-0.29, 1.2)</td>
<td>6.19 (5.11, 4.19)*</td>
<td>4.59 (2.45, 4.08)</td>
</tr>
</tbody>
</table>

Notes. Values in parenthesis are 95 % percentiles estimated using 1,000 bootstrap replications. The sign * denotes that the cumulative response of government spending and GDP are both negative.

and upper bound of the multiplier are much bigger than that of the defense news.

The responses of working hours, real wage, and service consumption are also quite different. In the first model, working hours increase significantly over time and then decreases back to the initial level in about four years, like the responses of real GDP. However, in the second model, hours rather decreases over time and then increases back to the initial level. Real wage tends to increase in about 1-2 years in the first model, but real wage tends to decrease in the second model. Service consumption increases strongly in the first model, but it tends to decrease in the second model.

In fact, these variables are key variables when we evaluate the theory based on the empirical results. Two contrasting views on the effects of government spending shocks have the opposite predictions on these variables. The neoclassical approach (e.g., Aiyagari et al. (1992), and Baxter and King (1993)) emphasizes a negative wealth effect, and predicts that consumption decreases, labor increases, real wage decreases, and output rises. In contrast, the new Keynesian approach (e.g., Rotemberg and Woodford (1992); Devereux et al. (1996); Galí et al. (2007) ) tries to explain a rise in consumption and real wage found in some empirical studies. Among the empirical studies which examine responses of consumption and real wage, SVAR-based studies (e.g., Blanchard and Perotti (2002); Fatás et al. (2001), sign restriction approach (e.g., Mountford and Uhlig (2009); Pappa (2009)) generally show
positive responses of consumption and real wage. On the other hand, narrative approaches like Ramey and Shapiro (1998), and Ramey (2011b) found falls on consumption and real wage.

However, with taking a closer look at the narrative approach literature, the effects of positive government spending shock still have no clear consensus. Table 1 shows the inconsistencies in the narrative approach literature. Using Ramey and Shapiro (1998) war date dummy, Edelberg et al. (1999); Burnside et al. (2004) found consumption falls to the government spending shocks, while Caldara and Kamps (2008) and Monacelli et al. (2010) displayed positive response of consumption and real wage. With defense news in Ramey (2011b), Ramey (2011b) found decreases in consumption and real wage, but Ben Zeev and Pappa (2014) showed increases in consumption and real wage. Cimadomo et al. (2011) showed that the positivity of response in consumption may depend on the future expected reversality of spending. Employing forecast errors, Corsetti et al. (2012) and Tenhofen and Wolff (2010) had negativity in the responses of consumption and real wage. As explained, the first model seems to be the one that Ramey (2011b) intended to build. Throughout the paper, Ramey (2011b) emphasized that conventional VAR models do not properly capture the timing of changes in government spending and that measuring news about future government spending changes is important. The first model properly captures a news shock on future government spending changes. However, the second model does not seem to capture such a news shock.

When testing the Neoclassical approach, it is worthwhile to identify news shocks to future government spending changes. In the Neoclassical approach, persistent government spending shocks have a negative wealth effect for the representative household. Consumption decreases and labor supply increases when the representative household recognize the persistent changes in government spending. In other words, such effects will be captured strongly if theory is correct, when persistent government spending changes are anticipated. When government spending changes unexpectedly and temporarily, such a channel is not
likely to work.

Moreover, for the defense news, there are some debates about the sample period issue and the literature based on the defense news is not consistent. First, because the defense news covers the period with WW II and Korean war, there is a concern that the results may be affected by the war time where it has most of its explanatory power of government spending. Perotti (2011) claims that rationing should be considered to analyze response of consumption component in the sample periods with war time, and he finds that durable consumption rises to defense news if one dummies out 1941:4 and 1942:1. Ramey (2011a) contradicts Perotti (2011)s view and if one wants to deal with the rationing issue, one should dummy out 1942:1 and 1942:2, rather than 1941:4 and 1942:1. In figure 3 and 4, which are our replication with dummy following Perotti (2011) and Ramey (2011a), although the signs of the responses are kept, the significance are shown to be affected by the choice of the dummy. We also test the extended defense news series of Ramey (2011b) for the 1955:1-2013:4(not shown), however, due to its weak explanatory power after Korean war, the results are insignificant and shows very wide error bands.

Based on these findings, another evidences seem to be needed to support the negative effects of government spending with fiscal foresight on consumption and real wage, at least for the post-Korean war period.

3 Modified Model with Government Spending News Variable

3.1 Modified Model based on SPF Data

In the previous section, we suggest that the second model does not properly capture news shocks on future government spending changes, which is important when the effects of government spending shocks are examined. In this section, we modify the second model
Figure 3: Ramey (2011b): Defense news from 1939:1-2008:4, dummy out 1941:1 and 1942:1
Figure 4: Ramey (2011b): Defense news from 1939:1-2008:4, dummy out 1942:1 and 1942:2
Figure 5: Real federal government spending and SPF forecast for federal government spending (in Billions of chained 2009 dollars).

Source: Real federal government spending is obtained from real-time data for macroeconomist given by Fed of Philadelphia.

to properly capture the news shocks on future changes in government spending for the post-Korean war period. In particular, we construct an estimate of changes in the expected present value of government spending by using the forecast data from the SPF. The following is the details on how we construct the estimate. The Federal Reserve Bank of Philadelphia provides forecasts for real federal government spending from 1981Q3, and from zero to four-quarter ahead forecasts. Also, the base year of the original SPF forecast data changes over time, past studies including Ramey (2011b) often used the growth rate of the SPF forecast data.

In contrast, Leeper et al. (2012) construct the SPF forecast level data by rebasing the series. Figure 5 plots the rebased SPF forecast data for time t made at t in level and actual federal government spending. The base year change of SPF is not shown the rebased SPF data, and it accompanies the trend of actual government spending, showing some fluctuations.

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4See appendix A in Leeper et al. (2012) for the details on the rebase procedure of SPF data. For the sample until 2008, we use the exact rebased SPF forecast in Leeper et al. (2012), which are in 2005 constant dollar. However, after 2013:2, the base year of NIPA series is changed by year 2009. Thus, for the post-2008 period, we replace the implicit price deflator by 2009 constant dollars, so that the rebased forecast series are in 2009 constant dollar.
Table 3: The explanatory power of rebased SPF

<table>
<thead>
<tr>
<th>Model</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$R^2$</td>
<td>Marginal F-statistics</td>
<td>Coeff. of lag 0</td>
<td>t-statistics</td>
</tr>
<tr>
<td><strong>1981:3 - 2008:4</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ramey (2011b)</td>
<td>0.349824</td>
<td>8.69939</td>
<td>0.97265</td>
<td>2.39281</td>
</tr>
<tr>
<td>Perotti (2011)</td>
<td>0.35003</td>
<td>7.40077</td>
<td>0.997882</td>
<td>2.41736</td>
</tr>
<tr>
<td><strong>1981:3 - 2013:4</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ramey (2011b)</td>
<td>0.477363</td>
<td>10.48249</td>
<td>0.916819</td>
<td>2.41181</td>
</tr>
<tr>
<td>Perotti (2011)</td>
<td>0.378904</td>
<td>11.17037</td>
<td>0.972532</td>
<td>2.49197</td>
</tr>
</tbody>
</table>

Notes. Columns (1), (3), and (4) are statistics obtained from a regression of the growth of real per capita federal spending on current and 1 to 4 lags of the growth of rebased SPF, lags 1 to 4 of the log of real per capita of government spending, which is total spending for Ramey (2011b) and federal and state and local spending for Perotti (2011), the log of real GDP, the 3-month T-bill rate, and the Barro-Redlick average marginal tax rate. Column (2) are from a regression which is same with previous one except excluding the growth of SPF.

Also, table 3 reports the explanatory power of rebased SPF level data, following the test conducted in Ramey (2011b). Without actual spending component in the measure, rebased SPF data has F-statistics exceeding 10 for the longest sample period, and around 7 or 8 for 1981:3-2008:4. F-statistics below 10 may the evidence of weak-instrument problem, however, as Ramey (2011b) mentioned, macro shocks in the literature usually have F-statistics which is lower than 10, and the defense news in Ramey (2011b) for post-Korean war has F-statistics below 5.\(^5\)

We use the rebased SPF forecast level data to construct the expected present value of SPF forecast data.

$$f_t^{PV} = \sum_{j=1}^{4} \frac{1}{r_{t+j}} (f_{t+j|t}^e - f_{t+j|t-1}^e)$$ (3)

Since SPF forecast data provides one- to four-quarter ahead forecasts, we calculate the expected present value of government spending of each quarter by summing up the discounted

\(^5\)As specification of Perotti (2011) of testing explanatory power is slightly different from Ramey (2011b)s, so we conduct both specifications of test.
value of one- to four-quarter ahead forecasts. Following Ramey (2011b), we use the 3-year treasury bond rate as the discount rate.\(^6\) We take log-difference, which may capture percentage changes in the present value from the last period.

Then, we estimate the VAR model that replaces the forecast error measure with the newly constructed measure of expected present value of government spending.

### 3.2 Comparison with other measures: Forni and Gambetti (2014) and Caggiano et al. (2015)

Our method to identify future news shock in government spending is in line with the methodology used in Born et al. (2013); Forni and Gambetti (2014); Caggiano et al. (2015), which are all constructed as growth rate or changes in growth rate due to the base year change.\(^7\) That means the measures capture basically the difference in the growth rate which may lose some information about the level of data, rather than in the level of government spending.

\[
n_{13}^g = \sum_{j=1}^{3} \Delta f_{t+j|t} - \Delta f_{t+j|t-1} \\
= \sum_{j=1}^{3} (f_{t+j|t} - f_{t+j-1|t}) - (f_{t+j|t-1} - f_{t+j-1|t-1})
\]

### 3.3 Empirical Results

Figure 6 reports the impulse responses to shocks to the newly constructed news variable based on SPF data. Now government spending initially does not change, as in the first model of Ramey (2011b), and it starts to increase in about six quarters. The increase in government spending is persistent. This response may be regarded as those to news shocks

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\(^6\) Similar results were also obtained when we use 3-month T-bill rate and 1-year treasury bond rate.

\(^7\) Born et al. (2013) uses one-quarter ahead forecasts for time \(t+1\) made time \(t\) to deal with fiscal foresight. Perotti (2011) also construct the approximation of the present value based on forecast revisions which is not shown in the paper. However, without rebase of the years, the PV measure in Perotti (2011) has outliers due to the base year changes and that may affects the estimation to be biased. In the follow-ups of the literature, as mentioned above, many studies dealt with the base year issue by taking growth rate.
Figure 6: The effects of SPF PV shocks: SPF PV shock from 1981:4 to 2008:4

The standard error bands for 68% and 95% are displayed.
on expected changes in future government spending. Output response is more persistent as in the first model of Ramey (2011b). Due to weakly negative initial response of government spending, government spending multipliers at 1 and 2 year swings from negative -50 to positive 50. Because the response of government spending peaks around 17 quarters, cumulative multiplier steadily decreases after 3 years.

The multipliers calculated by peak responses is 4.6, and under integral is almost identical to the peak multiplier. For the estimated shock of government spending is so persistent, we also test the VAR with SPF PV for longer period: 80 quarters. Figure 7 shows the responses of government spending and GDP for 80 quarters. As predicted by news hypothesis, GDP rises before government spending goes up. GDP peaks at around 10 quarters and after that steadily decreases, while government spending rises after like 4 quarters, peaks at around 20 quarters, and after that gradually go down to the normal level. The cumulative multiplier(not

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8Our multipliers are in line with Auerbach and Gorodnichenko (2012), which estimates government spending multipliers controlling measures in Ramey (2011b) in recession and expansion. They also have big multipliers, like 4.88, for the defense news of Ramey (2011b) in recession.
shown) rapidly declines after 4 quarters and stays around 2 after 10 years. Hours and real wage also increase as in the first model of Ramey (2011b). It is also notable that consumption and investment tend to increase.

Overall, government spending shocks have more expansionary effects on the economy by properly constructing news shocks. Government spending multiplier is larger. Although government spending multiplier is found to be negative in the second model of Ramey (2011b), government spending multiplier is at least larger than zero by properly constructing news shocks, as in the first model of Ramey (2011b). In addition, working hours and consumption also increases, as in the first model of Ramey (2011b) but differently from the second model of Ramey (2011b). Therefore, by using a similar method to properly construct news shocks, the results are similar to the first model of Ramey (2011b). Our results are in line with Ben Zeev and Pappa (2014), which investigated the effects of anticipated defense spending shocks identified using the maximum forecast error variance methodology. They concluded that fiscal news shock raises not only GDP, but also consumption and investment.

However, the result of this modified model shows even more expansionary effects than the first model of Ramey (2011b). Our multiplier is much bigger than that of Ramey (2011b). The positive responses of consumption and investment are more significant. Real wage increases are also significant. These responses are not really consistent with the Neoclassical view, contrary to what Ramey (2011b) argued. In particular, consumption and real wage increases, contrary to the prediction of the Neoclassical models.

4 Robustness

4.1 Alternative Sample Periods

Some alternative sample periods are considered. First, we estimate the SPF PV shocks with several subsample periods; first, based on Perotti (2011), we estimate the VAR without severe recession periods(1981-1982 and 2008) from 1983:1 to 2007:4(in figure 8), and with
Figure 8: Subsample period: the effects of SPF PV shocks for 1983q1-2007q4

The standard error bands for 68 % and 95 % are displayed.
Figure 9: Subsample period: the effects of SPF PV shocks for 1983q1-2007q4

The standard error bands for 68 % and 95 % are displayed.
the longest available sample period, from 1981:3-2013:4 (in figure 9). The results are almost identical, while in the former, response of government spending become less significant than the original model. Exploiting the sample period fully, we also find that the results are similar, whereas government spending and components consumption and investment rise more significantly and hours become less significant.

4.2 Component issue: Federal spending and Private GDP

The issue of components in government spending and GDP may affect to our result. First, federal spending may have different effect with the total spending.\(^9\) In figure 10, we estimate the SPF PV VAR with rotating total government spending by federal government spending, and we find that the results are almost identical.

Second, Ramey (2012) examined whether the increases in government spending stimulates the private sector or not, to see the effects of government spending on the private welfare. She analysed response of private GDP to government spending shocks, rather than that of total GDP. In figure 11, we check the response of private GDP to the SPF PV shock. As total GDP reacts, private GDP rises significantly before the government spending increases, and turns to the normal level.

4.3 Tax Policy

In our results, Barro-Redlick tax rate falls to every specifications, while it rises to the defense news of Ramey (2011b). We do robustness checks that the different response of tax rates may come from the sample period. In figure 12 and 13, we find that the tax rate and components of government spending significantly correlated negatively after 1980 period. In contrast, looking the graph of tax rate and the defense news of Ramey (2011b), we find that the peaks of defense news are followed by rises in tax rates. However, in the figure XI in

\(^9\)See for the issues on government spending components, e.g., Ben Zeev and Pappa (2014) for the defense spending, Perotti (2014) for the comparing defense spending and civilian spending.
Figure 10: Government spending Components: federal spending, 1981q3-2008q4
Figure 11: GDP components: the effects of SPF PV shocks with private GDP, 1981q3-2008q4

The standard error bands for 68 % and 95 % are displayed.

Figure 12: Tax rate: Defense news measure in Ramey (2011b) and Barro-Redlick tax rate
Ramey (2011b), average tax rate rises to three different samples, which for with and without WW II and Korean war.

To control the effects of tax rate on our results, we do the counterfactual analysis holding tax rate constant to the government spending shock, which is similar to the methodology in Bachmann and Sims (2012). Figure 14 displays the impulse response estimated from counterfactual analysis. With holding tax rate, we still find the consumption components and real wage rises significantly while GDP and hours slightly become insignificant.

5 Conclusion

Ramey (2011b) suggested that anticipated future government spending changes should be fully taken into account in order to properly measure the effects of government spending shocks. Ramey (2011b) further constructed two types of news variables to address these issues: changes in expected future present discount value of defense spending (based on the Business Week and other newspaper sources) and forecast errors of changes in government spending (based on SPF data).
Figure 14: Counterfactual analysis: tax rate control for 1981q3-2008q4

The standard error bands for 68% and 95% are displayed.
This paper argues that the second measure cannot properly capture anticipated future government spending changes, contrary to Ramey (2011b)'s original assertion. Forecast errors of government spending are unanticipated parts of government spending by construction and are not likely to include anticipated future government spending changes. In fact, the empirical effects of the forecast error shocks do not resemble the ones that comprise anticipated future government spending changes.

This paper further suggests the construction of changes in the expected future present discount value of changes in government spending based on SPF data. Impulse responses to shocks to such variables tend to capture anticipated government spending changes. The empirical results further show that the government spending multiplier is clearly positive and that consumption, investment, and real wages increase. These results are not consistent with the neoclassical view.

References


