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Do expectations matter? Reassessing the effect of government spending on key macroeconomic variables in Germany

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DISCUSSION PAPER SERIES

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Do Expectations Matter? Reassessing the Effect of Government Spending on Key Macroeconomic Variables in Germany

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Abstract

This paper investigates the effects of government spending on key macroeconomic variables in Germany. It contributes to the ongoing debate on how to properly identify exogenous fiscal shocks in the data and on whether or not the government should intervene in the business cycle. Following Ramey (2011b), we include expectations held by consumers and firms into the standard VAR framework based on information from historical issues of the German political magazine *Der Spiegel*. The results suggest that government spending lowers gross domestic product, as it crowds out private consumption and investment. The findings also underscore the need to account for expectations, as failing to do so leads to significant misinterpretation of the effects of government spending. In fact, when neglecting anticipation effects, our results support the recent findings for Germany by pointing to a rather positive effect of government spending on GDP.

Keywords: Fiscal Policy, Government Spending, Vector Autoregression Model, Expectations
JEL no.: C32, D84, E32, E62, H31, H32

1. Introduction

How do government spending shocks affect key macroeconomic variables? This question is crucial not only for making fiscal policy decisions, but also for understanding the underlying transmission mechanisms of government spending and for distinguishing between different macroeconomic models. In empirical investigations, the most commonly applied technique to assess the influence of public spending is the standard VAR (SVAR) model. Studies based on SVAR—used, among others, by Fatás and Mihov (2001), Blanchard and Perotti (2002), Galí et al. (2007), and Perotti (2007)—usually find that an unexpected rise in government spending leads to an increase in gross domestic product and total hours worked, as well as an increase in consumption and real wages.

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From a theoretical viewpoint, neither the neoclassical model of Aiyagari et al. (1992) and Baxter and King (1993) nor the standard Keynesian model can explain the SVAR results (see Galí et al., 2007). Ramey (2011b) emphasizes that this is because traditional approaches neglect consumers' expectations. While the SVAR approach identifies government spending shocks when they actually occur, it evidently takes time for fiscal policy to be changed in response to shocks to the domestic economy. Therefore, changes in government spending are often known in advance and might well be anticipated by the time the shock actually occurs. For this reason, the identified SVAR shocks may be delayed.

Expanding upon Ramey and Shapiro (1998), Ramey (2011b) suggests a so-called expectations-augmented VAR (EVAR) model that accounts for the effects of anticipation by identifying the precise moment when a future increase in government spending first appeared in the news. In contrast to the SVAR estimations, the EVAR approach yields the neoclassical results for the United States: while gross domestic product and total hours worked rise, consumption and real wages fall. These and other EVAR implementations—such as Edelberg et al. (1999) and Burnside et al. (2004)—have led to an intense debate among economists as to whether the SVAR model or the EVAR approach is most suitable to properly identify exogenous fiscal shocks in the data (see Mertens and Ravn, 2010, Perotti, 2011, 2014, and Ramey, 2011a). However, this discussion is thus far mainly confined to evidence on the United States.

To enrich the current debate, the contribution of our paper is twofold. First, we replicate the EVAR approach of Ramey (2011b) using data from Germany and compare the estimated impact of government spending shocks on key macroeconomic variables to the estimates obtained by an SVAR specification. To model expectations, we use articles published in the German political magazine *Der Spiegel* to identify the moment when future government spending shocks are first reported by the media. Second, our paper adds to the literature on the effects of government spending shocks in Germany. Our findings based on the EVAR model yield different implications than earlier studies based solely on SVAR methods (see, e.g., Perotti, 2005, Breuer and Buettner, 2010, Tenhofen et al., 2010, Alfonso and Sousa, 2012). While the findings of these traditional approaches strongly coincide with the results for the United States, our analysis challenges the prevalent view that government purchases positively stimulate gross domestic production.

The remainder of this paper is organized as follows. Section (2) describes the Blanchard and Perotti (2002) standard VAR model as well as the Ramey (2011b) expectations-augmented VAR approach in detail. In Section (3), we use both the SVAR model and the EVAR approach to analyze data from Germany. We find a contractionary response of gross domestic product to a rise in government spending, which is induced by a crowding out of private consumption and investment. Although the results are qualitatively similar regardless of whether we use the SVAR model or the EVAR approach, the effects are much more pronounced in the case of the EVAR application. When assessing the isolated effect of government investment, we obtain striking differences between SVAR and EVAR, which resemble the findings of Ramey (2011b) for the United States. In this case, SVAR implies a positive effect of government spending on GDP, while EVAR points to a negative impact. Thus, our paper supports the view that identification methods matter. We conclude in

Section (4).

2. SVAR approach vs. EVAR approach

The standard approach to analyze the effects of government spending and tax shocks on key macroeconomic variables is the structural VAR model of Blanchard and Perotti (2002). The identification method of this approach is essentially equivalent to a Choleski decomposition with government spending ordered first. In contrast, Ramey (2011b) uses a narrative approach to identify government spending shocks in the data. Because of her concern that many government spending shocks identified by the Blanchard and Perotti (2002) SVAR approach have already been anticipated by the time the policy change finally takes place, she constructs a dummy variable indicating periods where *Business Week* initially forecasted large increases in defense spending in response to exogenous political events. Here, the basic idea is to identify the point in time when consumers and firms are initially informed about future changes in government spending and are able to adjust their expectations and thus their consumption and investment decisions. This technique is referred to as the expectations-augmented VAR (EVAR) model.

The original Ramey and Shapiro (1998) dummy variable takes a value of one in 1950:3, 1965:1, and 1980:1 and a value of zero elsewhere. The dates refer to the Korean War, the Vietnam War, and the Carter-Reagan buildup following the Soviet invasion of Afghanistan. Ramey (2011b) adds a fourth value in 2001:3 for the Bush buildup in the aftermath of 9/11. In order to directly compare the SVAR model and the EVAR approach, Ramey (2011b) augments the Blanchard and Perotti (2002) model with the military date variable ordered first. A regression of the growth of real defense spending on the current value and eight lags of the expectation dummy variable yields an R-squared of 0.26. Thus, even the simple military date variable may be considered an appropriate indicator for the growth of real defense spending.

SVAR and EVAR essentially differ in identifying the timing of the shocks. While the EVAR approach is based on historical records of news, the SVAR model identifies shocks when they actually occur. From the standpoint of the neoclassical model, what matters for the wealth effect is not the particular timing of the increase in government spending, but the timing of the change in the discounted present value of government spending. Consumption serves as a good example. In a neoclassical world, consumption should fall immediately in response to consumers' awareness of a future shock in government spending and slowly recover over time. If the model identifies the shock too late, what is observable is in fact the recovery process and not an increase in consumption in response to the government spending shock.

Ramey (2011b) applies both specifications to data from the United States and estimates a positive effect of government spending shocks on gross domestic product and total hours worked in both cases. However, the results are much more pronounced when using the EVAR model. The main differences between the two approaches arise with respect to the responses of consumption, investment, and real wages. When using the SVAR model, consumption

appears to rise, investment falls, and real wages increase. When using the EVAR approach, consumption is seen to fall, investment initially rises, and real wages fall.

3. Evidence from Germany

In this section, we apply the SVAR model and the EVAR approach to data from Germany. For the EVAR approach, we construct a dummy variable for Germany that aims at indicating large increases in government spending caused by exogenous events in a similar way as the Ramey (2011b) military date variable.

3.1. Model and data

For the SVAR approach, we utilizing seasonally adjusted quarterly data from the German Federal Statistical Office (2006, 2014). The reduced form of our model is

$$Y_t = A(L)Y_{t-1} + U_t,$$

where Y_t is a vector containing the logarithms of quarterly real per capita government spending, gross domestic product, consumption, investment, total hours worked, real wages, and taxes, $A(L)$ is a distributed lag polynomial, and U_t contains the reduced form errors, which are linear combinations of the mutually uncorrelated structural residuals E_t and can thus be written as

$$U_t = \Gamma E_t.$$

To estimate Γ, we use a Choleski decomposition similar to Ramey (2011b).

Data for the included variables is available from 1970:1 to 1991:4 for West Germany and from 1991:1 to 2014:1 for the reunified Germany. To connect these two time series, we extend the data for the reunified Germany backwards using the growth rates of the corresponding time series for West Germany. To capture the potential break in the data due to this procedure, we include a dummy variable with a value of one in 1991:1 and a value of zero elsewhere. Further, we include a linear and a quadratic time trend. In accordance with Akaike's information criterion, we include five lags of the above mentioned variables.

For the EVAR approach, we construct a dummy variable indicating large increases in government spending in Germany, whose construction is similar to the Ramey (2011b) dummy variable. For Germany, however, defense expenditures are not as important as they are for the United States. In 2012, military spending accounted for 17.6% of central government spending in the United States, whereas it made up only 4.7% of central government spending in Germany (see World Bank, 2016). Therefore, we follow Blanchard and Perotti (2002) by utilizing total government spending. In order to rule out the possibility that this choice might cause a distortion in the results, the sensitivity analysis covers a set of alternative specifications based on the available sub-components of the government spending series. Figure (1) shows total government spending in percent of gross domestic product for Germany. We identify four major increases in total government spending for the period from 1970 to 2014, which are indicated by the vertical lines.

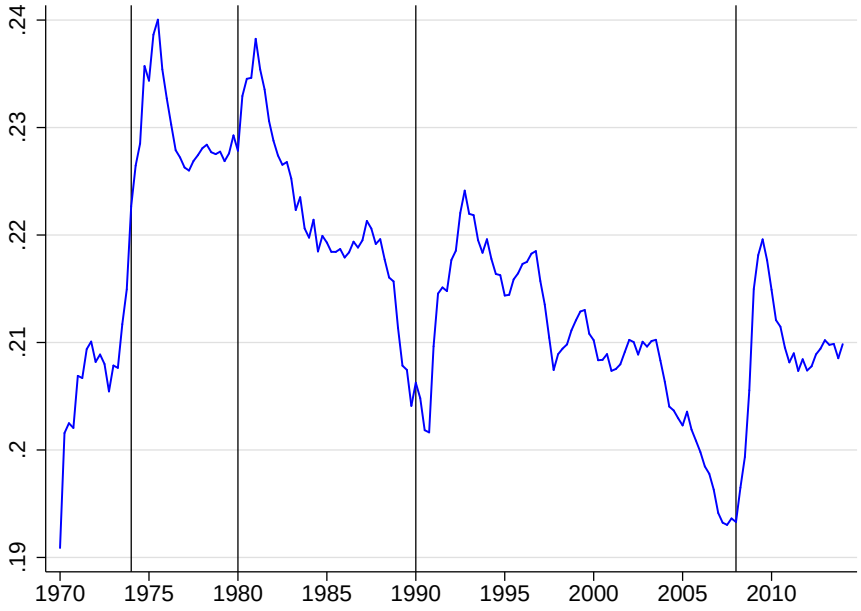

Figure 1 Total Government Spending in Percent of Gross Domestic Product. The vertical lines mark the quarters in which the expectation dummy assumes a value of 1. Data is from Federal Statistical Office (2006, 2014).

Following Ramey (2011b), we use newspaper sources to precisely identify times when future government spending shocks could have been anticipated by the consumers and firms. These shocks include increases in government spending induced by major events whose occurrence is unrelated to the state of the German economy. Due to data availability, we choose to use articles published in *Der Spiegel*, which has been released weekly since 1947. We are aware that only a small part of the German population frequently reads *Der Spiegel* and that other media sources, for example the daily news show *Tagesschau*, are used by a considerably larger part of the population to acquire information. Nevertheless, one can assume that once a topic appears in the daily news, the following week's issue of *Der Spiegel* reports on it. Therefore, our chosen source is suitable to identify the quarter in which the news is first announced. The final dummy variable for Germany takes a value of one in the following four quarters and a value of zero elsewhere:

(1) *First Oil Crises (1974:1)*
The first oil crisis started in October 1973, when OPEC proclaimed an oil embargo in response to the U.S. decision to support Israel during the Yom Kippur war. By the end of the embargo in March 1974, the price of oil had risen from 3 US-Dollars per barrel to nearly 12 US-Dollars. In December 1973, *Der Spiegel* began to report on a impending increase in government expenditures as a reaction to the beginning recession in Germany.

(2) *Second Oil Crises (1980:1)*
Decreased oil output in the wake of the Iranian Revolution gave rise to the second oil

crisis. While global oil supply decreased by only 4%, widespread panic drove the price far higher than justified by supply. The price of crude oil rose to 39.50 US-Dollar per barrel. From December 1979 on, *Der Spiegel* reported on a proposed fiscal stimulus package.

(3) *German Reunification (1990:1)*
On October 3, 1990 the German Democratic Republic joined the Federal Republic of Germany after more than 40 years of separation. The subsequent funding of East Germany's economy led to a rapid increase in government expenditures. This has been reported on by *Der Spiegel* since January 1990.

(4) *Financial Crisis (2008:1)*
The financial crisis began in 2007 with the subprime mortgage crisis in the United States. It reached its temporary climax in September 2008 with the collapse of Lehman Brothers, one of the largest investment banks in the United States. In February 2008, *Der Spiegel* began to report on the German government's preparations to deal with the possible spread of the economic crisis to Europe.

The passages from *Der Spiegel* to which we refer are provided in appendix (A). A regression of the growth of total government spending on the current value and eight lags of the identified dummy variable yields an R-squared of 0.3121. Therefore, this variable can be considered a suitable indicator for large increases in government spending.

3.2. Results

Figures (B1) and (B2) in the appendix show the estimated impulse response functions (solid lines) for Germany using both the SVAR model and the EVAR approach. The depicted shocks are normalized such that real government spending rises by 1%. The standard errors (dashed lines) are 68% confidence intervals using bootstrapping with 500 repetitions.

We can observe that government spending peaks several quarters later when using the EVAR approach, which can be considered an indication that timing indeed matters. In both specifications, gross domestic product decreases significantly after a short initial increase. While total hours worked increase when using the SVAR model, they initially increase, then decrease, and later increase again when using the EVAR approach. Consumption decreases regardless of whether we use the SVAR model or the EVAR approach. This is in line with the predictions of the neoclassical model as described in the introduction. However, this effect is much more pronounced in the case of the EVAR approach. The effect on investment is negative in both specifications, but is again stronger when we account for expectations. When considering real wages via the SVAR model, we observe a small but insignificant positive effect in the short run, which turns into a significantly negative effect in the medium run. When using the EVAR approach, the effect is significantly negative throughout the observed time horizon. Again, the effect ascertained by the EVAR approach is much stronger than that found by the SVAR model.

While models that neglect expectations tend to find a positive effect of government spending on the German economy, the results obtained via EVAR yield diametrically different implications. Most strikingly, we find an overall *negative* response of gross domestic product driven by a negative response of private consumption and investment.

These results are crucial for fiscal policy decisions. Obviously, the negative effects on private investment and consumption more than cancel out the positive effects of the increase in government expenditures such that the total effect on gross domestic product becomes negative. If government expenditure completely crowds out private spending, the effects of fiscal stimulus packages as a whole must be cast into doubt. Our results further suggest that expectations held by firms and consumers are indeed crucial for identification of government spending shocks in the data and estimation of the responses of key macroeconomic variables to these shocks. To further investigate this supposition, we also perform Granger causality tests and ascertain that the identified dates variable Granger-causes the SVAR-based government spending shocks ($p = 0.0611$), but the SVAR shocks do not Granger-cause the dates variable ($p = 0.2223$). Therefore, the SVAR shocks are forecastable, which in turn underscores that the EVAR approach is the preferred model in this context.

3.3. Robustness checks

To asses the stability of our results, we perform robustness checks, using government consumption and government investment instead of total government spending. The time series for Germany and the respective dates of our dummy variable are illustrated in Figures (2) and (3). First, consider the effect of government consumption. The referring impulse response functions are shown in Figures (B3) and (B4) in the appendix. There are virtually no differences when compared to the previously discussed results.

Second, we replace total government spending with government investment. These results are illustrated in Figures (B5) and (B6) in the appendix. Here, we find important differences compared to our initial estimations.

First of all, we cannot observe a delayed peak in government spending when using the EVAR approach. Here, both methods identify the maximum as occurring directly after the shock takes place. For the EVAR approach, the estimated impulse response functions have almost the same shape as before, but are less pronounced when we use government investment instead of total government spending. However, the results for the SVAR model are strikingly different. When utilizing only government investment, the effects on gross domestic product, total hours worked, consumption, and real wages become positive, albeit small, and in some cases insignificant. The effect on investment is still negative, but is less pronounced and mostly insignificant throughout the observed time horizon. In conclusion, when using government investment instead of total government spending we find the results of Blanchard and Perotti (2002) with application of the SVAR model, and neoclassical results via the EVAR approach.

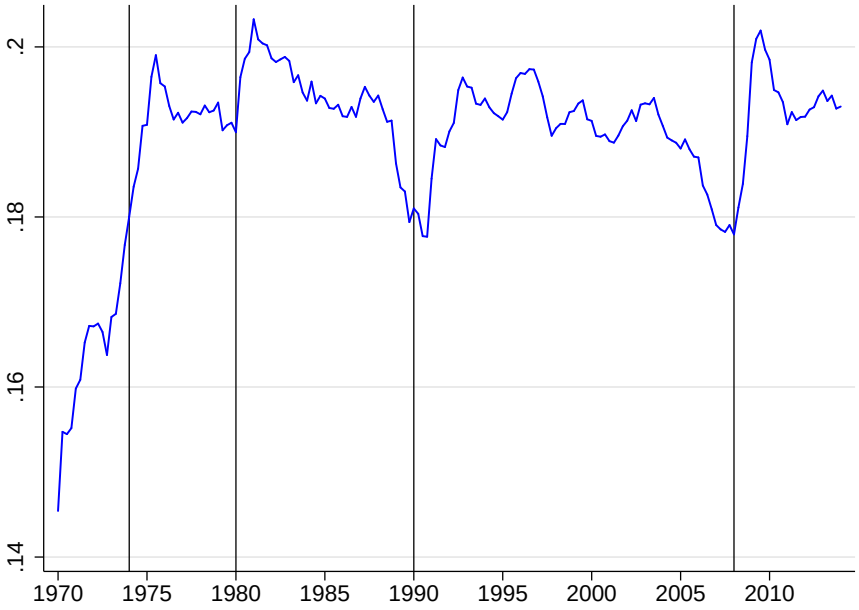

Figure 2 Government Consumption in Percent of Gross Domestic Product. The vertical lines mark the quarters in which the expectation dummy assumes a value of 1. Data is from Federal Statistical Office (2006, 2014).

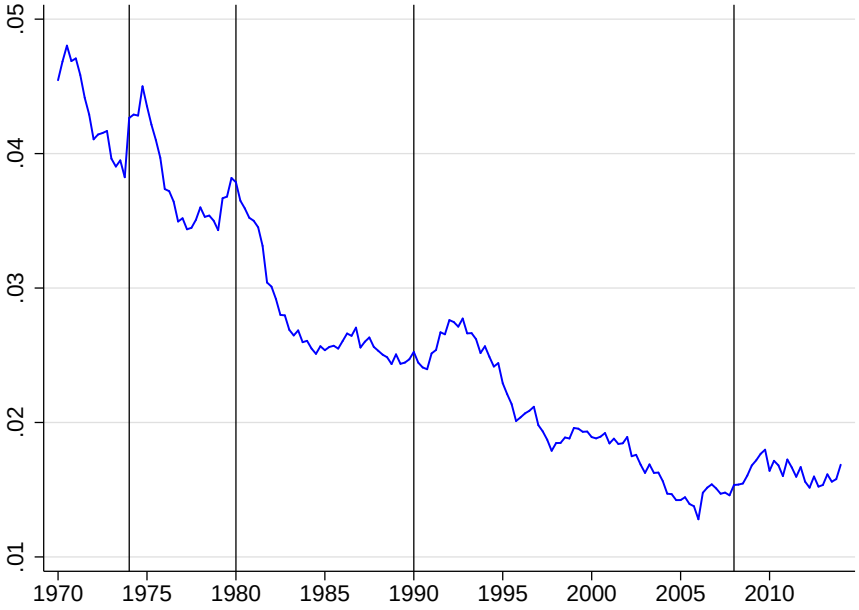

Figure 3 Government Investment in Percent of Gross Domestic Product. The vertical lines mark the quarters in which the expectation dummy assumes a value of 1. Data is from Federal Statistical Office (2006, 2014).

4. Conclusion

Our paper contributes to the ongoing debate in the literature on how to properly identify government spending shocks in the data. While the SVAR approach identifies government spending shocks when they actually occur, the EVAR model explicitly captures consumers' and firms' expectations. Based on data for Germany, we support the findings of Ramey (2011b), concluding that the inclusion of expectations matters. While both SVAR and EVAR imply a negative effect of government spending on gross domestic product which is induced by a negative effect on private consumption and investment, the results are much more pronounced when including expectations. The differences are even more striking when using government investments. The SVAR model in this case implies a positive effect on GDP, which supports the results found in earlier studies for Germany. In contrast, inclusion of expectations points to a negative effect on aggregate output.

Appendix A: Text passages in "Der Spiegel" used to compute our expectations dummy variable

The selection of our dummy which reflects expectations of major government spending shocks is based on the following issues of *Der Spiegel*:

First Oil Crisis (1974:1)

Issue 52/1973:
„Obwohl die Preise noch immer kräftig steigen, lockerte Bonn die Konjunkturbremsen. Eigenheime sind nun wieder steuerbegünstigt, Investitionen nicht mehr belastet."

Issue 53/1973:
„Als weiteren Krisen-Hemmer halten Bonns Regierende einen bereits konzipierten zusätzlichen Investitionshaushalt parat. Mit 4,5 Milliarden Mark aus dem Etat sollen Eisenbahnen, Straßen und öffentliche Gebäude gebaut werden."

Issue 5/1974:
„Kanzler, Opposition und Arbeitgeber wollen Steuersenkungen noch in diesem Jahr. Finanz- und Wirtschaftsminister sind dagegen – zumindest jetzt."

Second Oil Crisis (1980:1)

Issue 52/1979:
„Mehr Geld denn je will die Bundesregierung in das Schienennetz der Bundesbahn stecken: In den nächsten zehn Jahren sollen 43,6 Milliarden Mark ausgeworfen werden, knapp 30 Prozent der Gesamtausgaben für den Ausbau des Verkehrsnetzes. [...] Die SPD-Politiker wollen schon im Januar, wenn die Regierung über den Jahreswirtschaftsbericht und über die Ölversorgung beraten muß, vorschlagen, statt bisher rund 30 Millionen Tonnen deutscher Kohle künftig mehr als 40 Millionen Tonnen für Strom einzusetzen und die notwendigen Subventionen aus dem Haushalt zu nehmen."

Issue 6/1980:
„In seiner Regierungserklärung kündigte Schmidt an, die Bundesregierung wolle die Erzeugung von Öl und Gas aus Kohle ‚mit aller Kraft' vorantreiben. Es sollten Anlagen errichtet werden, die der deutschen Industrie eine ‚Spitzenstellung auf den Weltmärkten' verschaffen. [...] Forschungsminister Volker Hauff kündigte an, daß er die neue Technologie mit etlichen Milliarden fördern wolle. Am vergangenen Mittwoch machte das Bundeskabinett die ersten 70 Millionen Mark für Vorprojekte locker."

Issue 25/1980:
„Die Schulden des Staates wachsen schneller als erwartet. Noch im September 1979 war die Deutsche Bundesbank davon überzeugt, daß sich die Defizite der öffentlichen Haushalte

1980 ‚aufgrund des verringerten Ausgabenanstiegs vermindern' werden. Jetzt mußten sich die Frankfurter Banker korrigieren. Nach den jüngsten internen Berechnungen der Bank benötigen die öffentlichen Hände 1980 zusätzliche Kredite von 49,5 Milliarden Mark – 5,5 Milliarden mehr als 1979."

German Reunification (1990:1)

Issue 43/1989:
„Sein ‚nationales Sofortprogramm' will der Kanzler nächsten Monat vorlegen. Zentrale Punkte: Weitere steuerliche Anreize sollen private Investoren zum Bau von Sozialwohnungen ermuntern; dafür müssen sie die Mieter akzeptieren, die von den Wohnungsämtern geschickt werden. Zusätzliche, direkte Subventionen sollen Bürgern den Bau von Eigenheimen oder Eigentumswohnungen ermöglichen. Bonn wird für die nächsten Jahre mindestens 1,6 Milliarden Mark jährlich für den sozialen Wohnungsbau ausgeben."

Issue 2/1990:
„Allein für die Sanierung des vergifteten Gewässersystems der DDR seien, so schätzen Experten, 100 Milliarden Mark notwendig. Noch einmal soviel würde es kosten, die Energieerzeugung auf umweltverträglichere Verfahren umzustellen."

Issue 7/1990:
„Zu diesem Konjunkturprogramm gehört auch die Bonner Zusage, Milliarden in die Reichsbahn, in die verrotteten Straßen und in das armselige Telefonnetz der DDR zu investieren, natürlich aus Steuermitteln. [...] Die klassischen Infrastruktur-Investitionen wird Waigel wahrscheinlich mit dem dicken Bundesbank-Gewinn bezahlen und, wenn das nicht reicht, mit neuen Schulden. Doch Bonner Milliardenspritzen für Rentner und Arbeitslose sind so nicht zu finanzieren."

Financial Crisis (2008:1)

Issue 5/2008:
„Die Koalitionsrunde Wirtschaft, ein Gremium von Wirtschaftsexperten beider Regierungsfraktionen, vergab auf ihrer letzten Sitzung am vergangenen Montag einen Auftrag an den Vertreter des Wirtschaftsministeriums. Die Fachleute von Minister Glos sollten doch prüfen, was sich im Falle eines Wachstumseinbruchs für Stabilisierung und Stimulierung der Binnennachfrage machen ließe. [...] Was sich davon bereits abzeichnet, läuft auf ein Konjunkturprogramm hinaus. Danach soll die staatliche Förderbank KfW zusätzliche Maßnahmen beim ‚energetischen Gebäudesanierungsprogramm' und bei den gerade auf den Weg gebrachten Klimaschutzvorhaben finanzieren. Außerdem sollen Investitionen in der Verkehrsinfrastruktur vorgezogen werden. [...] Und damit auch die Bürger die Konjunktur ankurbeln können, wollen Glos' Beamte ihre Lieblingsidee eines Steuerrabatts ins Programm nehmen. [...] Zugleich schlagen die Ministerialen vor, den Kündigungsschutz zu lockern und die Zeitarbeit weiter zu liberalisieren. Das soll die Investitionsbedingungen verbessern und so die Binnennachfrage stützen."

Issue 6/2008:
„Den Beamten im Bundeswirtschaftsministerium kommt der Zuspruch aus der Wissenschaft gelegen. Sie würden die Steuerzahler gern um rund vier Milliarden Euro entlasten, vor allem kleine und untere Einkommen sollen profitieren. [...] Sollte der Aufschwung in Deutschland tatsächlich abbrechen, dürfte Steinbrück aus den eigenen Reihen Druck bekommen. Mancher Genosse sympathisiert unverhohlen mit CSU-Mann Glos. ‚Wenn auf dem Meer der Orkan wütet, muss man an der Küste Vorkehrungen treffen', sagt etwa SPD-Fraktionsvize Ludwig Stiegler. [...] Ihm selbst schwebt ein ‚Maßnahmenmix' vor, mit dem die Konjunktur gestützt werden soll."

Issue 8/2008:
„Allein die Matthäus-Maier-Bank KfW hat in mittlerweile drei Rettungsaktionen knapp fünf Milliarden Euro für die Risiken der IKB bereitstellen müssen. 1,9 Milliarden schießt nun der Bund zu, weil die KfW langsam klamm wird. [...] Bei der WestLB hat das Land Nordrhein-Westfalen eine Milliarde nachgeschossen und zudem das Risiko für drei weitere Milliarden übernommen. In Sachsen sieht es noch schlimmer aus. Dort bürgt das Land mit 2,73 Milliarden für die Sachsen LB. Die übrigen Landesbanken stehen für weitere 14 Milliarden Euro ein. Die HSH Nordbank aus Hamburg braucht dringend eine Milliarde frisches Kapital, und auch die BayernLB hat sich verzockt, indem sie für mindestens 1,9 Milliarden Euro Papiere gekauft hat, die derzeit unverkäuflich sind. [...] Am Ende mussten Bund und private Banken einspringen. Auf keinen Fall wollte Finanzminister Peer Steinbrück die IKB pleitegehen lassen. [...] ‚Letztendlich geht es hier um die Frage, was das geringere Übel ist, was der Volkswirtschaft weniger schadet', erklärte der Minister in der KfW-Verwaltungsratssitzung am vergangenen Mittwoch, kurz bevor man beschloss, die Bank wieder einmal zu retten."

Appendix B: Impulse Response Functions

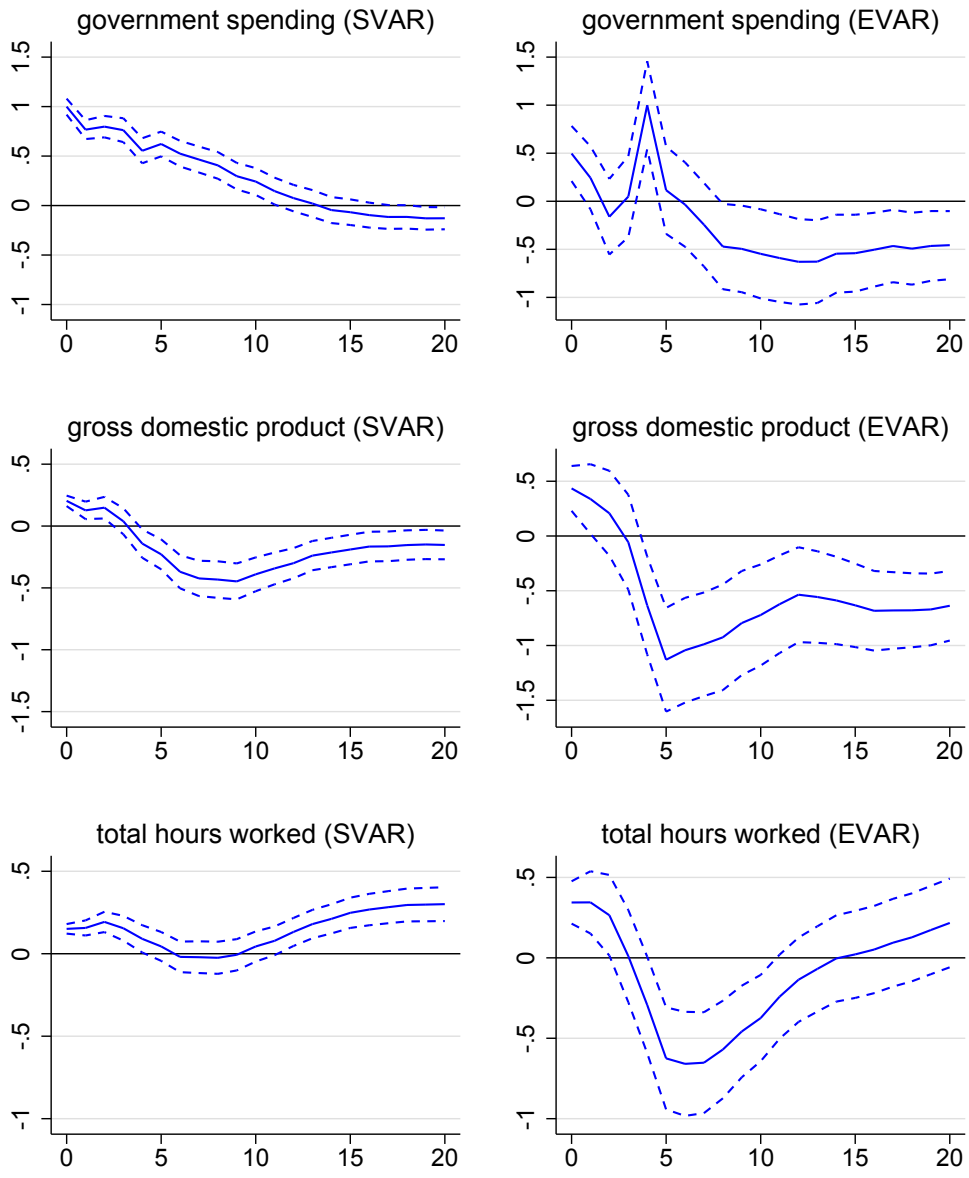

Figure B1 Impulse Response Functions Using Total Government Spending (Part 1). The dashed lines are 68% confidence intervals based on bootstrap standard errors with 500 repetitions. Data is from Federal Statistical Office (2006, 2014).

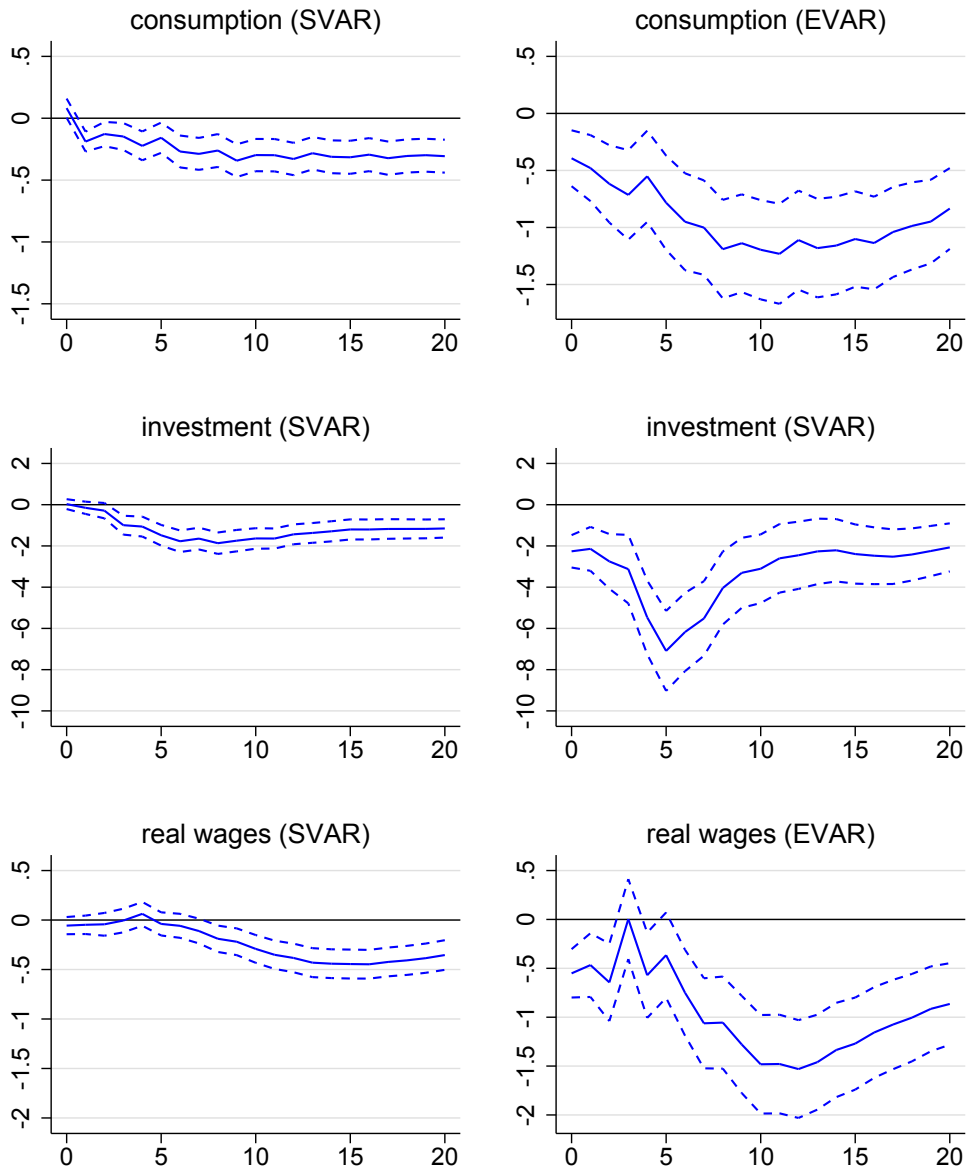

Figure B2 Impulse Response Functions Using Total Government Spending (Part 2). The dashed lines are 68% confidence intervals based on bootstrap standard errors with 500 repetitions. Data is from Federal Statistical Office (2006, 2014).

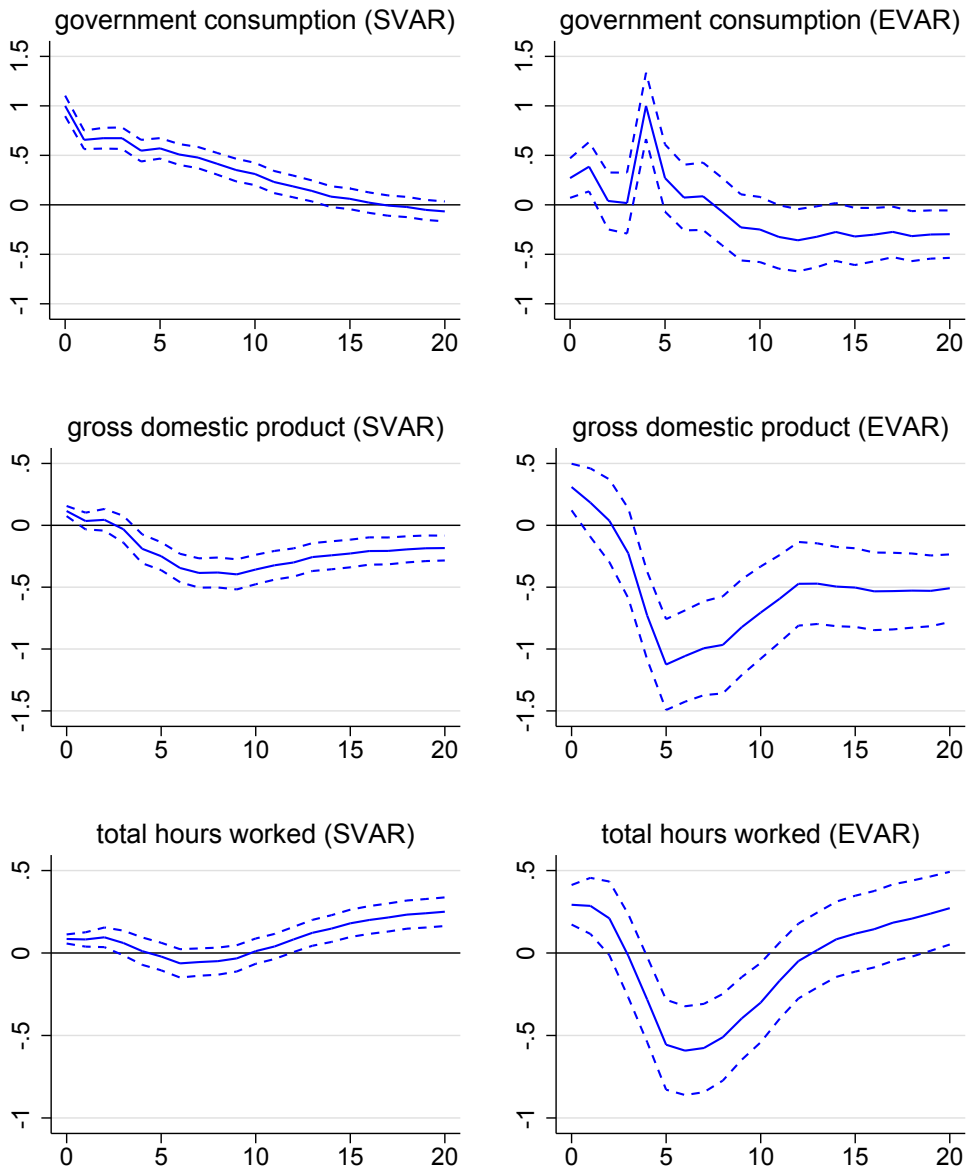

Figure B3 Impulse Response Functions Using Government Consumption (Part 1). The dashed lines are 68% confidence intervals based on bootstrap standard errors with 500 repetitions. Data is from Federal Statistical Office (2006, 2014).

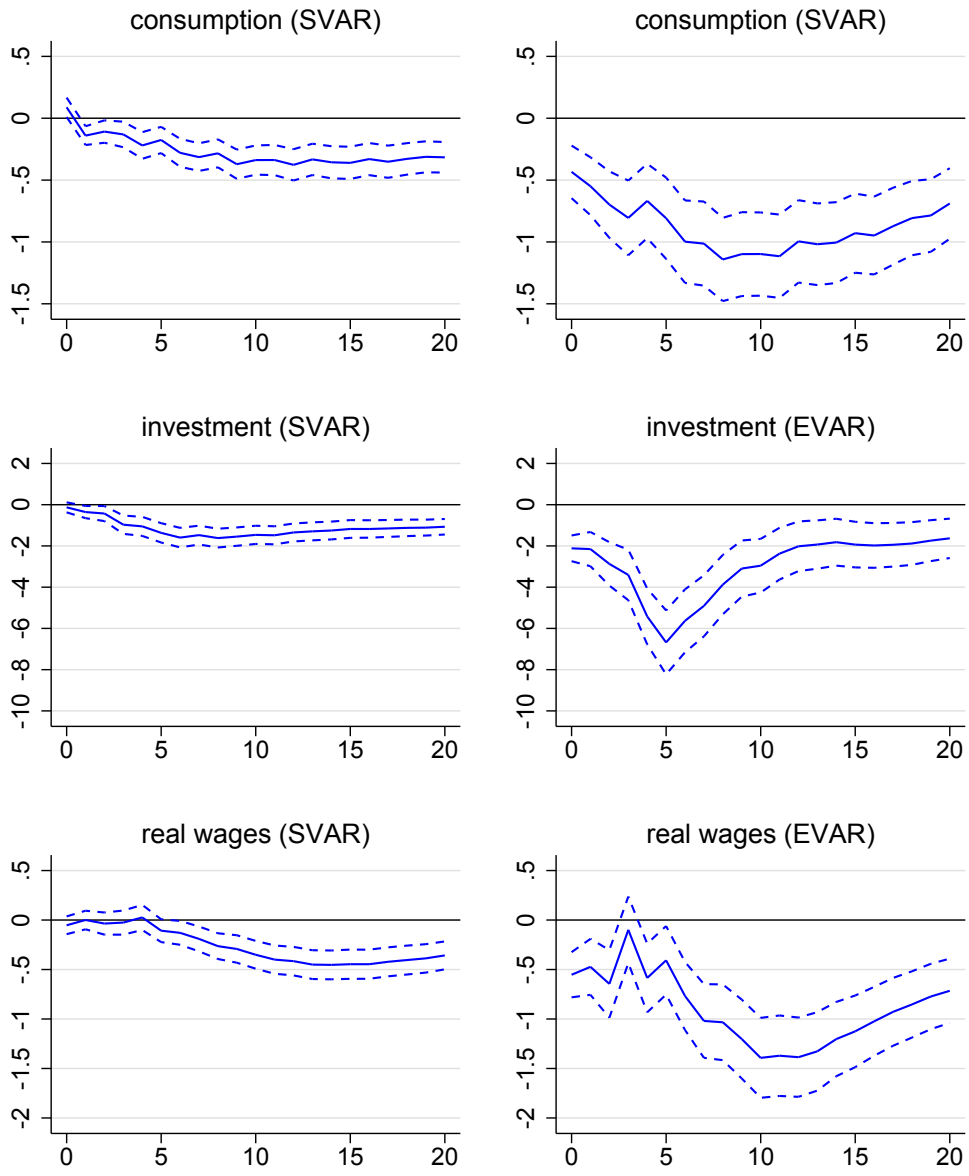

Figure B4 Impulse Response Functions Using Government Consumption (Part 2). The dashed lines are 68% confidence intervals based on bootstrap standard errors with 500 repetitions. Data is from Federal Statistical Office (2006, 2014).

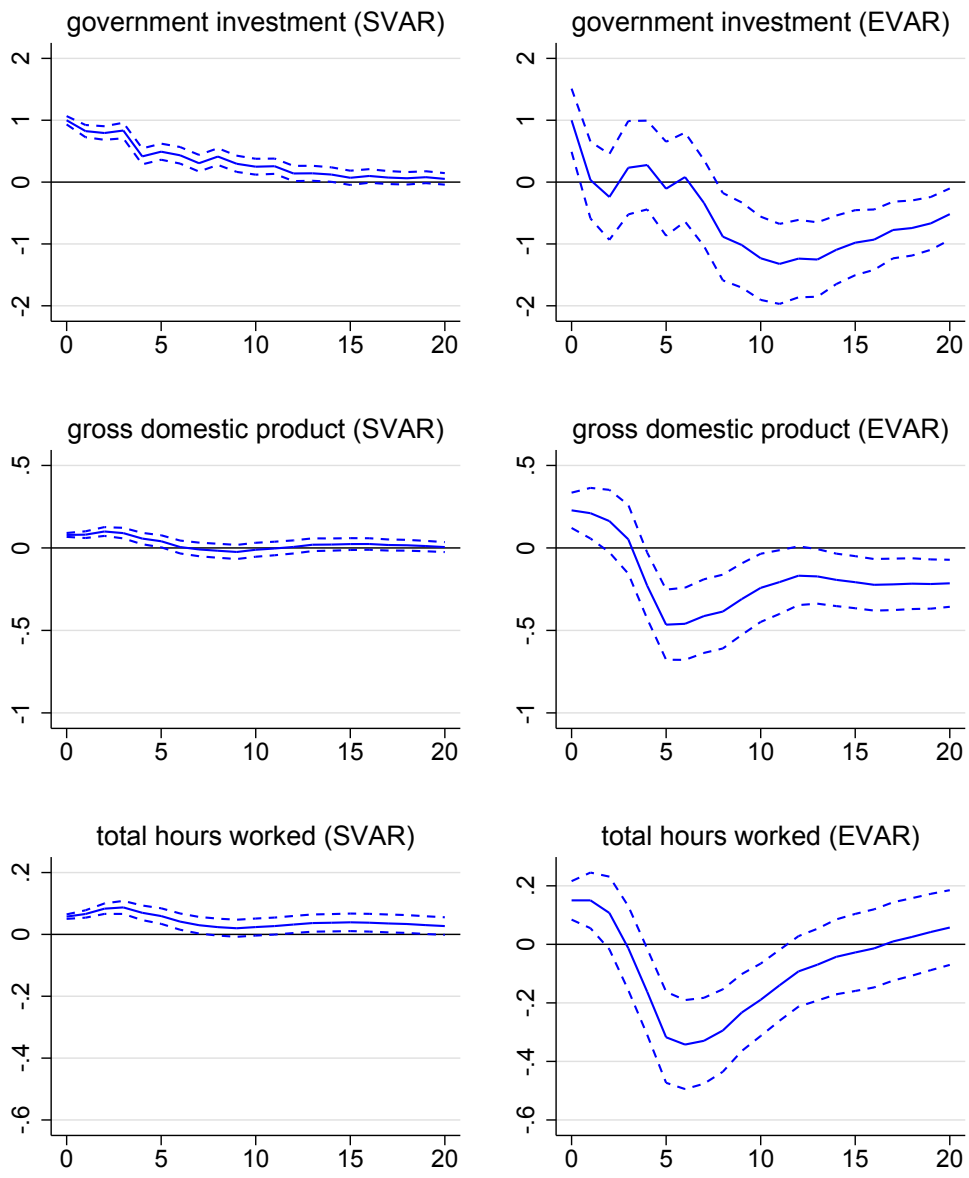

Figure B5 Impulse Response Functions Using Government Investment (Part 1). The dashed lines are 68% confidence intervals based on bootstrap standard errors with 500 repetitions. Data is from Federal Statistical Office (2006, 2014).

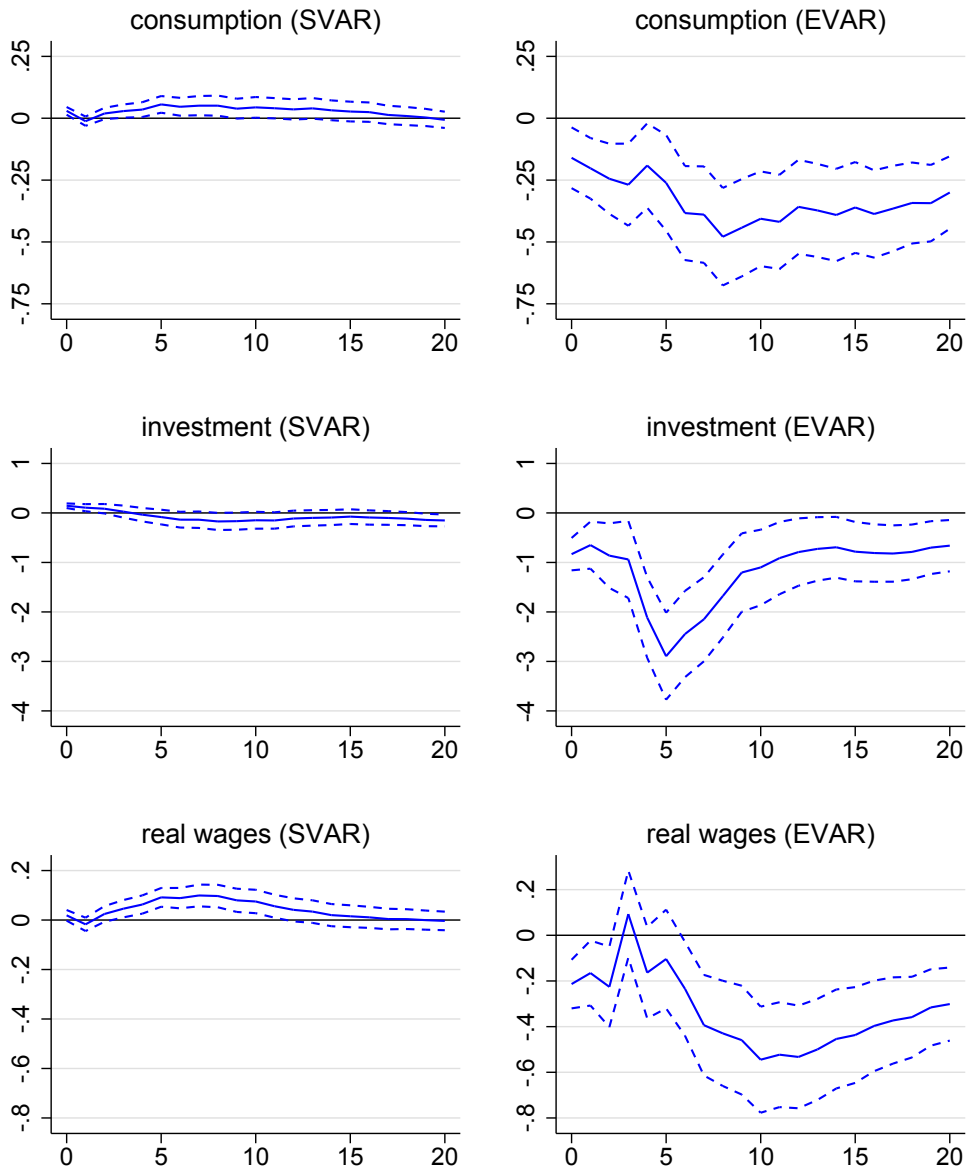

Figure B6 Impulse Response Functions Using Total Government Spending (Part 2). The dashed lines are 68% confidence intervals based on bootstrap standard errors with 500 repetitions. Data is from Federal Statistical Office (2006, 2014).

References

Aiyagari, S. R., Christiano, L. J., and Eichenbaum, M. (1992). The Output, Employment, and Interest Rate Effects of Government Consumption. *Journal of Monetary Economics*, 30(1): 73–86. 2

Alfonso, A. and Sousa, R. M. (2012). The Macroeconomic Effects of Fiscal Policy. *Applied Economics*, 44(34): 4439–4454. 2

Baxter, M. and King, R. G. (1993). Fiscal Policy in General Equilibrium. *American Economic Review*, 83(3): 315–334. 2

Blanchard, O. and Perotti, R. (2002). An Empirical Characterization of the Dynamic Effects of Changes in Government Spending and Taxes on Output. *Quarterly Journal of Economics*, 117(4): 1329–1368. 1, 2, 3, 4, 7

Breuer, C. and Buettner, T. (2010). Fiscal Policy in a Structural VAR Model for Germany. München. 2

Burnside, C., Eichenbaum, M., and Fisher, J. D. M. (2004). Fiscal Shocks and their Consequences. *Journal of Economic Theory*, 115(1): 89–117. 2

Edelberg, W., Eichenbaum, M., and Fisher, J. D. M. (1999). Understanding the Effects of a Shock to Government Purchases. *Review of Economic Dynamics*, 2(1): 166–206. 2

Fatás, A. and Mihov, I. (2001). The Effects of Fiscal Policy on Consumption and Employment: Theory and Evidence. Discussion Paper 2760, Centre for Economic Policy Research. 1

Federal Statistical Office (2006). Fachserie 18 Reihe S.28. Wiesbaden. 4, 5, 8, 13, 14, 15, 16, 17, 18

Federal Statistical Office (2014). Fachserie 18 Reihe 1.3. Wiesbaden. 4, 5, 8, 13, 14, 15, 16, 17, 18

Galí, J., López-Salido, J. D., and Vallés, J. (2007). Understanding the Effects of Government Spending on Consumption. *Journal of the European Economic Association*, 5(1): 227–270. 1, 2

Mertens, K. and Ravn, M. O. (2010). Measuring the Impact of Fiscal Policy in the Face of Anticipation: A Structural VAR Approach. *Economic Journal*, 120(544): 393–413. 2

Perotti, R. (2005). Estimating the Effects of Fiscal Policy in OECD Countries. Discussion Paper 4842, CEPR. 2

Perotti, R. (2007). In Search of the Transmission Mechanism of Fiscal Policy. In Acemoglu, D., Rogoff, K., and Woolford, M., editors, *NBER Macroeconomic Annual*, volume 22, pages 169–226. 1

Perotti, R. (2011). Expectations and Fiscal Policy: An Empirical Investigation. Working Paper 19, Growth and Sustainability Policies for Europe. 2

Perotti, R. (2014). Defense Government Spending Is Contractionary, Civilian Government Spending Is Expansionary. Working Paper 20179, National Bureau of Economic Research. 2

Ramey, V. A. (2011a). A Reply to Roberto Perotti's "Expectations and Fiscal Policy: An Empirical Investigation". Technical report, University of California. 2

Ramey, V. A. (2011b). Identifying Government Spending Shocks: It's All in the Timing. *Quarterly Journal of Economics*, 126: 1–50. 1, 2, 3, 4, 5, 9

Ramey, V. A. and Shapiro, M. D. (1998). Costly Capital Reallocation and the Effects of Government Spending. *Carnegie-Rochester Conference Series on Public Policy*, 48: 145–194. 2, 3

Tenhofen, J., Wolff, G. B., and Heppke-Falk, K. H. (2010). The Macroeconomic Effects of Exogenous Fiscal Policy Shocks in Germany: A Disaggregated SVAR Analysis. *Jahrbücher für Nationalökonomie und Statistik*, 230(3): 328–355. 2

World Bank (2016). World Development Indicators database. Washington D.C. 4