Searching for the Confidence Fairy: Evidence from a New Narrative Dataset on Announcements of Fiscal Austerity Measures

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"To choose austerity is to bet it all on the confidence fairy."

Joseph Stiglitz, The Guardian (2010)

Abstract

Using a newly constructed dataset of announcements of fiscal consolidations, we explore the role of the expectations channel in shaping the effect of those announcements on macroeconomic aggregates. We find no evidence that either consumer sentiment or long-term interest rates act as 'confidence fairies' during episodes of fiscal austerity. However, the responses of both variables strongly depend on the composition of the announced consolidation. Announcements of government spending cuts have little effect on sentiment, while announcements of revenue-based consolidations depress it. Counterfactual experiments show that the combined effect of the responses of consumer confidence and interest rates amplify the negative effect on the real economy of announcements of revenue-based austerity measures.

Keywords: fiscal austerity, fiscal multiplliers, consumer confidence.

JEL classifications: E21, E62, H5.

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1 Introduction

What is the role of confidence in the transmission of fiscal austerity measures? Policymakers and commentators tend to believe that the effects on confidence play an important role in the success or failure of fiscal austerity measures. Some would argue that this was made particularly clear by the long-lasting economic sluggishness that followed the austerity measures taken in Europe in the aftermath of the Great Recession.

Recent research assigns an key role to news-driven changes in expectations as drivers of business cycle fluctuations. Nevertheless, the evidence of sentiment as an amplifier or mitigator of fiscal shocks is mixed, especially in the context of austerity measures. In this paper, we exploit a newly constructed narrative dataset of fiscal consolidations announcements to explore the role of confidence in the transmission of those shocks to the real economy.[1]

Models in the Keynesian tradition predict that a cut in public spending or a hike in taxes should have short-term contractionary effects, because they have a negative effect on disposable income. Recognizing the importance of sentiment for the effects of fiscal policy, Akerlof and Shiller (2009) posit the existence of a "confidence multiplier" that can amplify the Keynesian effects of fiscal measures. Bachmann and Sims (2012) quantify the role of confidence for the transmission of government spending shocks in the United States and indeed find evidence of a "confidence multiplier" à la Akerlof and Shiller (2009) during recessions.

The predictions of the Keynesians stand in sharp contrast with those of the supporters of the "expansionary austerity" hypothesis, who posit that the positive confidence effects of fiscal austerity measures can mitigate the contractionary effects of fiscal consolidations (Blanchard, 1990). Originating in the experiences of Ireland and Denmark in the 1990s (Giavazzi and Pagano, 1990), the hypothesis relies on the general public understanding the reasons for a fiscal adjustment. It understands that, if austerity measures are taken now, there is less need for more disruptive consolidation in the future. Hence, confidence increases, which stimulates private demand and investment. Ardagna (2004) and Alesina and Ardagna (2010) present evidence in favor of this hypothesis, suggesting that spending cuts may have a positive effect on sentiment. The ' confidence fairy' may even turn the effects of austerity measures into a mild expansion of the economy.

Crucial for our empirical analysis is the construction of a new narrative dataset of fiscal austerity announcements based on official documents and newspaper articles. This way, we can model the response of the economy to real-time information on austerity news. To the best of our knowledge, this is the first paper to single out the effect of news-driven innovations in consumer confidence on the real economy, based on a narrative identication of fiscal austerity shocks. In a quarterly panel VAR model augmented with sentiment measures, we run counterfactual

[1] Although the terms 'sentiment', 'confidence' and 'expectations' are not *stricto sensu* equivalent, in this paper we will use them interchangeably to refer to changes in the economic outlook of agents. Similarly, when referring to the consumer confidence index, we will also use the term of 'consumer sentiment'.

experiments in order to extract the potential role of the confidence channel. We find no evidence of the existence of a 'confidence fairy'. In fact, announcements of government spending cuts have little effect on sentiment, while announcements of revenue-based austerity measures depress sentiment. The responses of consumer confidence and interest rates amplify the negative effect of tax austerity announcements on the real economy.

The remainder of this paper is structured as follows. Section 2 provides a brief overview of the relevant literature. Section 3 describes our newly constructed dataset of announcements of fiscal consolidations. Section 4 presents the empirical model and discusses some issues regarding anticipation in fiscal VARs. Section 5 presents and discusses the results, and Section 6 shows the results of the counterfactual experiments. Finally, Section 7 concludes the paper.

2 Literature Review

The present study is at the intersection of the literature using the 'narrative' VAR approach to estimating fiscal multipliers and the literature on news-driven business cycles.

The Great Recession has motivated a large body of work estimating the sign and magnitude of fiscal multipliers. Given its focus on fiscal consolidations, this paper is part of a recent literature that estimates the output responses to austerity measures. According to the Keynesian view, tax increases and reductions in public expenditure depress private consumption by reducing disposable income, thereby leading to contractions in output. Indeed, empirical evidence generally finds that tax increases are contractionary (Blanchard and Perotti, 2002; Romer and Romer, 2010; Barro and Redlick, 2011; Favero and Giavazzi, 2012), with output multipliers between -0.5 and -5. Focusing on fiscal consolidation episodes in a panel of OECD countries, Guajardo et al. (2014) find that austerity measures, whether through revenue or expenditure measures, are associated with reductions in private consumption and GDP.

However, some empirical studies point to non-Keynesian effects of fiscal consolidations, attributing an important role to the expectations channel in shaping the response of the economy to policy impulses. For a sample of OECD countries Alesina and Ardagna (1998) and Alesina and Ardagna (2010) find that fiscal adjustments through public spending cuts can be expansionary. A common explanation for expansionary austerity results is attributed to the expectations or confidence channel: if private agents realize that the fiscal consolidation prevents a future increase in taxation, the adjustment spurs optimism about the future path of public expenditure and tax burdens. The positive revision of expectations results in a private expenditure increase, which can offset the negative effect of the adjustment on output. The experiences of Denmark and Ireland in the 1980s (Giavazzi and Pagano, 1990), the empirical work of Alesina and Ardagna (2010) and the model of Bertola and Drazen (1993) support this narrative. Additionally, a fiscal consolidation might reduce interest rates through its effect on the risk premium (Ardagna et al., 2007; Perotti, 2013), thus further encouraging consumption.

The importance of the "expectations channels" in shaping the dynamics of real variables has been confirmed by the recently developed news view of business cycles. The core element of this framework is the assumption that short-run output fluctuations can be driven by changes in the information set and expectations of agents. The revelation of information regarding future developments affects perceptions of individuals and firms, who act in anticipation of the future state of the economy (Beaudry and Portier, 2014). Our work is linked to a growing literature that explores the role of news by using explicit information about tax and government spending changes (Ramey, 2011; Mertens and Ravn, 2012; Brückner and Pappa, 2015). As in Ramey (2011), by 'news' we mean announcements of future fiscal austerity measures (and we will use the terms 'news' and 'announcements' interchangeably).

We will first review the evidence that news can affect confidence, and then discuss the important influence that expectations can have on the dynamics of real variables. Because confidence reacts to innovations in the information set of agents and constitutes a leading indicator of changes in consumption and income, there is scope that it provides a channel by which news affects real variables. Research indicates that news shocks affect perceptions about economic variables and measures of consumer sentiment. Using announcements of GNP growth, Mora and Schulstad (2007) find that current output growth is more accurately predicted by *perceived* than by realized GNP growth rate in the previous period. Oh and Waldman (1990) conclude that, even when false, predictions about future economic activity explain about a fifth of the realized movements in output. The empirical exercise included in Beaudry and Portier (2014) illustrates that news shocks with a long-run impact on total factor productivity explain about 80% of the variance in the consumer sentiment index. Based on a New Keynesian model, Barsky and Sims (2012) estimate that the relationship between confidence and economic activity is governed by news related to future fundamentals, thus indicating that foreseen changes in economic conditions might generate important movements in confidence by altering consumer expectations about the future state of the economy. This hypothesis is explored in the context of fiscal policy: using quarterly data Konstantinou and Tagkalakis (2011) find that expansionary fiscal policy can boost consumer and business confidence. Using monthly data, Beetsma et al. (2015) conclude that private sector confidence and long-term bond yields react to announcements of fiscal austerity.

In turn, consumer sentiment is an important predictor of household consumption growth (Carroll et al., 1994; Souleles, 2004; Ludvigson, 2004) and business cycles (Taylor and McNabb, 2007; Christiansen et al., 2014). Acemoglu and Scott (1994) empirically reject the rational expectations permanent income hypothesis due to the predictive content of consumer confidence for consumption and income growth, and Matsusaka and Sbordone (1995) find that changes in the index of consumer confidence that are not explained by fundamentals Granger-cause movements in output, explaining between 13-26% of its variance.

Recognizing the scope for sentiment to affect the dynamics of real variables, Akerlof and Shiller (2009) posit the existence of a "confidence multiplier" that may amplify the Keynesian

effects of fiscal policy. This hypothesis is investigated in a recent study by Bachmann and Sims (2012), by testing the role of confidence for the transmission of government spending shocks in the United States. Using VAR models, the authors carry out a counterfactual experiment to quantify the importance of consumer confidence in shaping the magnitude of fiscal multipliers. In linear specifications there is little evidence that confidence plays an important role in the transmission of spending shocks to output. Nevertheless, during recessions the "confidence multiplier" reinforces the Keynesian effects of increases in government spending.

The operation of the expectations channel could be different in the case of fiscal austerity measures. The positive role of sentiment is a recurrent element in discussions about the effects of fiscal consolidations, but it is backed only by scant empirical evidence. Some studies that investigate the response of financial markets to fiscal adjustments (Ardagna et al., 2007), conclude that bond yields may drop in response to credible cuts in public spending. Alesina et al. (2015b) claim that fiscal consolidations done on the spending side of the budget may induce a positive response of business confidence and investment. However, there has been no comprehensive investigation of the role of expectations for the effects of austerity measures. Based on existing literature, the evidence appears to be mixed.

Our present work contributes to existing knowledge about the transmission of fiscal policy shocks, by explicitly accounting for the consumer confidence and financial market channels. Similarly to Bachmann and Sims (2012), we quantify the "confidence channel" in the transmission of fiscal policy shocks. We expand their analysis in a number of directions. First, we consider both tax adjustments and changes in government spending, using real-time information on fiscal shocks. Second, we use a panel of countries as opposed a setting of a single economy. By tailoring our analysis to a European context and focusing on austerity measures, we provide a test for the existence of the 'confidence fairy' mentioned in recent policy discussions. Third, we broaden the concept of sentiment by considering the reaction of the long-term government bond yield alongside that of consumer confidence. Through a set of counterfactual simulations we consider the relative importance of these two expectational channels in shaping the responses of real variables to fiscal austerity measures.

3 Data

Fiscal Austerity Announcements

In order to gauge the transmission of policy shocks through the expectations channel, our empirical model incorporates information about future changes in the fiscal instruments. We time each announcement of a fiscal austerity measure to the moment when the intention of adopting a measure was first officially proposed by the government, and include the resulting series of news shocks in a VAR model.

We build our dataset starting from the measures documented in Devries et al. (2011). The authors use official government documents to identify fiscal consolidations in a number of OECD

countries, over the period 1978-2008. By carefully studying the motivation of a consolidation plan, they isolate the episodes which were not carried out as a response to macroeconomic fluctuations and are therefore"exogenous" to the business cycle. Using the same methodology, the Devries et al. (2011) dataset was extended by Alesina et al. (2015a) with observations for the period 2009-2013, albeit for a more restricted sample of countries. It is worth mentioning that both sources of data include the yearly projected impact of each austerity plan on the primary balance, for a maximum of six years after the adoption of the plan. In order to characterize country-specific fiscal plans, Alesina et al. (2015a) distinguish between the budgetary impact of unanticipated and anticipated fiscal measures within each plan. The data is recorded at annual level, and aggregates all anticipated and unanticipated measures from a particular austerity plan. Despite their valuable contribution, data at annual frequency fail to account for the combined effect of legislative and implementation fiscal policy lags, which can range from a couple of months to even two years.

Given the possibility that fiscal policy lags impact the estimates from annual data, we have carried out a detailed exploration of each fiscal consolidation plan mentioned in Devries et al. (2011) and we have identified the time when subsets the measures pertaining to it were first announced. By announcement we understand the month when a given fiscal measure was first officially mentioned/proposed by the government. In a previous contribution (Beetsma et al., 2015) we introduced a first version of this monthly dataset for the period 1978-2009, where each fiscal announcement was identified with a 0/1 indicator and classified as revenue- or expenditure-based according to its narrative description.

In this present work we assemble data regarding the timing and projected impact of the fiscal austerity announcements associated with the annual consolidation plans planned in Europe in the period 1978-2013. As a first step in the data creation process, we identify the fiscal austerity announcements done in the period 2009-2013 across the European countries in the Devries et al. (2011) sample. In doing so we complement the work of Alesina et al. (2015a) along some important dimensions. In addition to timing the policy announcements for the fiscal consolidation plans done after 2009, we expand the country coverage by including Finland, the Netherlands and Sweden in the sample.

The second step involves an important contribution in terms of quantifying the importance of each fiscal austerity announcement. From budget sources and official documents we can draw out the projected effects of certain measures or categories of measures included in each consolidation plan. By grouping the fiscal measures according to the date of their first official mention, we obtain an estimate of the importance of each announcement. The value we assign to each announcement is defined as the simple sum of the marginal impact generated by the measures included in the announcement on the *change* in the primary balance over the years when the measures come into effect.[2]

[2]While most measures are permanent in nature, some are temporary. The temporary effect of a measure is recorded as a reversal of its effect on the primary balance and is thereby accounted for in the value of the announcement.

Quantifying the impact of each individual announcement on the primary balance involved extensive data collection, namely extracting, cross-checking and combining information from a variety of documents such as the OECD Economic Surveys, the OECD Restoring Public Finances 2011 and 2012 Update Reports, national budgets, Stability and Convergence Plans, as well as information provided in newspaper articles. The values associated to the announcements generally reflect ex-ante projections of the effect that the component measures will exert on the change in the primary government balance. However, due to inaccuracies in the data sources, the values associated with the news can be a mix of ex-ante forecasts and ex-post estimates of the impact of the measures on the primary balance, and can thus only be interpreted as rough estimates of the importance of the austerity announcements.

Reporting the value instead of a simple indicator for a fiscal announcement presents an important advantage. Despite potential measurement error concerns, the values reported in the source documents contain important information about the size of the austerity measures announced at a given moment. Moreover, reporting the values of the announcements allows for their more accurate classification into revenue- and expenditure-based (not on the basis of the narrative description, but based on the estimated impact of the measures in either of the two classes).

Starting from the monthly dataset, we aggregate the fiscal announcements to a quarterly frequency. The most straightforward approach would be to assign the news shock to the quarter of the month when the announcement is made. However, some preliminary investigation suggests that fiscal news recorded in this way is anticipated by one quarter. A plausible explanation concerns the media coverage foreshadowing an impending announcement by the government, in particular because many austerity measures are proposed during the (known) national budgeting process. To eliminate anticipation, if a fiscal announcement was done in the first month of a quarter, we assign it to the previous quarter. When the timing of the announcement accounts for anticipation by one month, foresight of the shock no longer represents an issue.

In the remainder of the paper, the news series is based on the assumption that media coverage about an announcement commences a month before the actual announcement. However, our results are qualitatively robust to this assumption.[3]

Our database contains a total of 211 fiscal announcements. For 181 of them the magnitude of their impact on the primary balance is also reported. The cumulative impact of the measures on the primary balance ranges between 0 and 9.3% of GDP over a period of 6 years, with an average value of 1.36% of GDP in our country sample.[4] For the average announcement, the

[3]Note that Ramey (2011) also carried out an adjustment in the quarterly timing of the weekly defense shock. In that case, if the news had occurred in the last two weeks of a quarter, it was assigned to the following quarter based on the assumption that it could not have affected the aggregates contemporaneously during the entire quarter.

[4]The largest consolidations were announced for Ireland 2010:Q4 (9.3%), Sweden 1994:Q3 (8.4%) and Portugal 2011:Q3 (6.1%). Excluding these three consolidations, the average announcement has a value of 1.25% of GDP.

cumulative impact of the revenue measures is 0.5% of GDP and that of expenditure measures is 0.85% of GDP.

Table 1: Summary statistics of fiscal announcement data

Country	Number announcements	Average size all measures	Average size spending measures	Average size revenue measures
Austria	7	1.98	1.21	0.77
Belgium	18	1.14	0.68	0.46
Denmark	6	1.35	0.85	0.5
Finland	10	1.47	1.37	0.1
France	14	0.88	0.44	0.43
Germany	16	0.92	0.56	0.36
Ireland	15	2.05	1.1	0.95
Italy	25	1.31	0.74	0.57
Netherlands	23	1.12	0.96	0.16
Portugal	10	2.09	1.19	0.9
Spain	19	1.57	0.91	0.66
Sweden	5	2.38	1.57	0.8
United Kingdom	12	0.79	0.41	0.39
Total	181	1.36	0.85	0.51

Most consolidation plans combine measures on both the revenue and the expenditure side of the budget, which is why we classify announcements as predominantly revenue- or expenditure-based using a 50% threshold. Concretely, for each fiscal austerity announcement, if more than half of the total bugetary impact stems from expenditure cuts, the episode is classified as an expenditure-based consolidation, and vice versa for revenue-based consolidations.

Table 2: Fiscal announcements according to their predominant instrument

Country	Expenditure based	Revenue based	Equal	Total
Austria	5	2	0	7
Belgium	9	8	1	18
Denmark	3	3	0	6
Finland	8	2	0	10
France	9	5	0	14
Germany	10	6	0	16
Ireland	9	6	0	15
Italy	15	9	1	25
Netherlands	20	3	0	23
Portugal	6	4	0	10
Spain	11	8	0	19
Sweden	5	0	0	5
United Kingdom	8	4	0	12

Following our classification method, the majority of the announcements in our sample are expenditure-based. In the group of expenditure-based announcements, the average announcement has a value of 1.42% of GDP, with an impact of 1.14% of GDP on the spending side and 0.28% on the revenue side. In the group of revenue-based announcements, the average announcement has a value of 1.26% of GDP, with an impact of 0.30% of GDP on the spending side and 0.96% of GDP on the revenue side. Given the reduced number of news shocks per country,

the panel dimension is particularly useful in uncovering the effects of tax and expenditure-based measures.

Macroeconomic Series

Most of our quarterly variables are extracted from the OECD Economic Outlook database. We retrieve the data on government gross fixed capital formation from Eurostat and private investment from the IMF International Financial Statistics database. When the data is not seasonally adjusted at the source, we transform the series with the standard X-11 procedure.

As a measure of sentiment we use the monthly consumer confidence data available from the OECD. The original consumer confidence measures are based on questionnaires sent out to a random sample of the population, each containing four questions that elicit expectations regarding the future (personal and general) economic situation of the household. We base our analysis on the original measure of consumer confidence, expressed as the raw balance of positive over negative answers from the European consumer confidence survey. In order to use the variable in logs, we transform the series by shifting its mean (adding 100 to all values). This allows us to interpret the impulse response of confidence as the percentage change in the transformed variable.

4 Empirical Model

The empirical identification of shocks poses a challenge in the context of fiscal policy. Part of the difficulty of identification stems from the legislative and implementation lags inherent in fiscal policy, the sum of which can range from a couple of months to over two years (Leeper et al., 2013). Moreover, media coverage of discussions regarding changes in policy generally predates the signing of legislation and its implementation. By looking at military spending, Ramey (2011) finds that news reports about war dates Granger-cause rises in defense spending, thus proving the existence of anticipation about movements in government spending. If anticipated changes in taxes and public spending prompt economic agents to act before the fiscal measures are enforced, the innovations identified in a structural VAR do not capture the true timing of the shocks. Formally, the moving average representation of the VAR system is not invertible (Leeper et al., 2013), leading to imprecise inference. Moreover, according to Guajardo et al. (2014), anticipation effects could be an important explanation for the different conclusions of 'narrative' and structural VARs.

We tackle the possibility of fiscal foresight by identifying the fiscal innovations in the model based on our new series of austerity announcements. By defining our fiscal shocks in this way, we circumvent both the legislative lags (the time between the moment a law is proposed and the time it is passed into law) and the implementation lags (the period between the signing of legislation and the time it comes into force) inherent in fiscal policy, and thus avoid the problem of shock anticipation.

We estimate a panel VAR (PVAR) model of the standard form:

$$Y_{i,t} = \sum_{p=1}^{P} A_p Y_{i,t-p} + D_{i,t} + \varepsilon_{i,t}$$

$Y_{i,t}$ is a vector of endogenous variables, $D_{i,t}$ is a vector of deterministic components and $U_{i,t}$ is a zero-mean, stationary reduced-form disturbance. P represents the number of lags chosen and A_p is the matrix of coefficients associated with the pth lag. In the baseline specification, the vector of endogenous variables is:

$$Y_{i,t} = \left[FC_{i,t}, CC_{i,t}, LTI_{i,t}, C_{i,t}, GDP_{i,t}\right].$$

All variables are observed at quarterly frequency. In the equation, FC identifies the series of fiscal news shocks (where we use either indicator variables or values associated with the consolidation announcements). The other endogenous variables are the quarterly consumer confidence index (CC), the long-term government bond yield (LTI), private consumption (C) and output (GDP). All macroeconomic variables are in real terms, deflated using the GDP deflator. With the exception of the long-term interest rate, all series are expressed in logarithms and multiplied by 100 to facilitate the interpretation of coefficients as percentage changes.

The deterministic components included in benchmark VAR are a constant term, seasonal dummies, country fixed effects and country-specific linear trends. The Akaike, Schwarz and Hannan Quinn information criteria select lag lengths ranging between 2 and 5. However, to dispel any concerns about residual autocorrelation, we opt for a baseline specification containing 8 lags of the endogenous variables.[5] The equation is estimated with all variables in levels by means of ordinary least squares (OLS).

We investigate the impulse responses of the endogenous variables to a fiscal policy announcement. In terms of identification, we opt for a Cholesky structural decomposition where the fiscal announcement is ordered first, followed by the sentiment indicator, the government bond yield and the macroeconomic variables. We order the shock first in the Cholesky factorization because we use only consolidation episodes selected to be contemporaneously exogenous to the other variables in the VAR system. Moreover, as we illustrated in Figure 1, our assumption about the timing of the fiscal measures ensures that anticipation effects are not a concern. The news shocks is thus considered exogenous within each quarter and placed first in the Cholesky ordering.[6]

The impulse response confidence bands mark statistical significance at the 90% confidence level. The bands are constructed using standard bootstrap with 1000 replications. We normalize

[5]The main results of the paper are robust to different choices of lag structure and other configurations of deterministic components.

[6]As proven in Christiano et al. (1999), under the recursiveness assumption the variables in the block following the announcement shock in the Cholesky ordering exhibit impulse responses to this shock which are invariant to the ordering of the variables within the block.

the size of the impulse such that the results are intepreted as percentage changes in the variables in response to an announcement of fiscal consolidation measures with an impact of 1% of GDP on the primary balance.

The model is estimated on a sample of 13 European countries, using quarterly macroeconomic series for the period 1978:Q1-2014:Q4. The use of fiscal data over the time period we consider (over 35 years) would not be possible in the context of structural VAR estimation. In a structural VAR, fiscal policy shocks are recovered from structural restrictions imposed on the series and only data collected at quarterly frequency would enable correct identification (Ilzetzki et al., 2013). In the case of a narrative VAR, the shocks are not identified by imposing structural restrictions on the parameters, and thus the frequency of data collection poses less of a concern for the identification.[7]

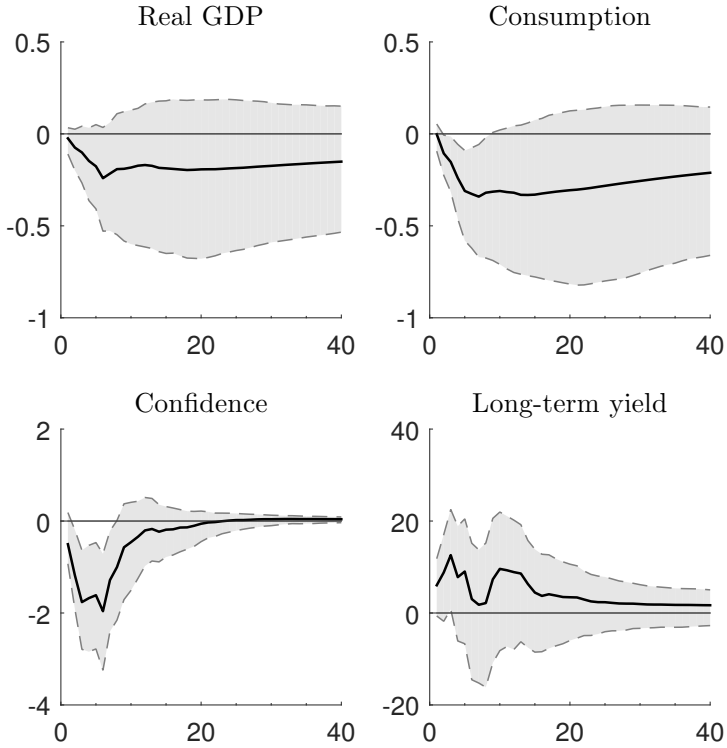
5 Results

The baseline analysis finds a negative reaction of output to fiscal consolidation announcements, casting doubt on the 'expansionary austerity' hypothesis. An announcement of future austerity amounting to 1% of GDP decreases confidence, increases the long-term interest rate and is associated to a drop in real private consumption of about 0.4% after 3 quarters. Output falls, reaching a 0.2% lower value 3-4 quarters after the announcement (Figure 1).

To explore more possibilities for the inclusion of control variables, we follow the strategy in Burnside et al. (2004) and Ramey (2011). Alongside the fixed set of variables included in the baseline specification, we rotate in the following controls, one at a time: the unemployment rate, public and private investment, government expenditure and tax revenue. The responses of the main variables remain robust: consumer confidence and private consumption decrease, while output records a slight downward tendency. The unemployment rate increases slightly on impact, with a response that reaches 0.2 percentage points after 4 quarters. The results of a more comprehensive model including the components of the government budget are presented in the appendix.

[7] Notwithstanding, it is possible for measurement error in the fiscal variables to bias the estimated coefficients towards zero, thus suggesting that in absence of measurement error our results would be stronger.

Figure 1: Impulse response to a 1% of GDP news shock



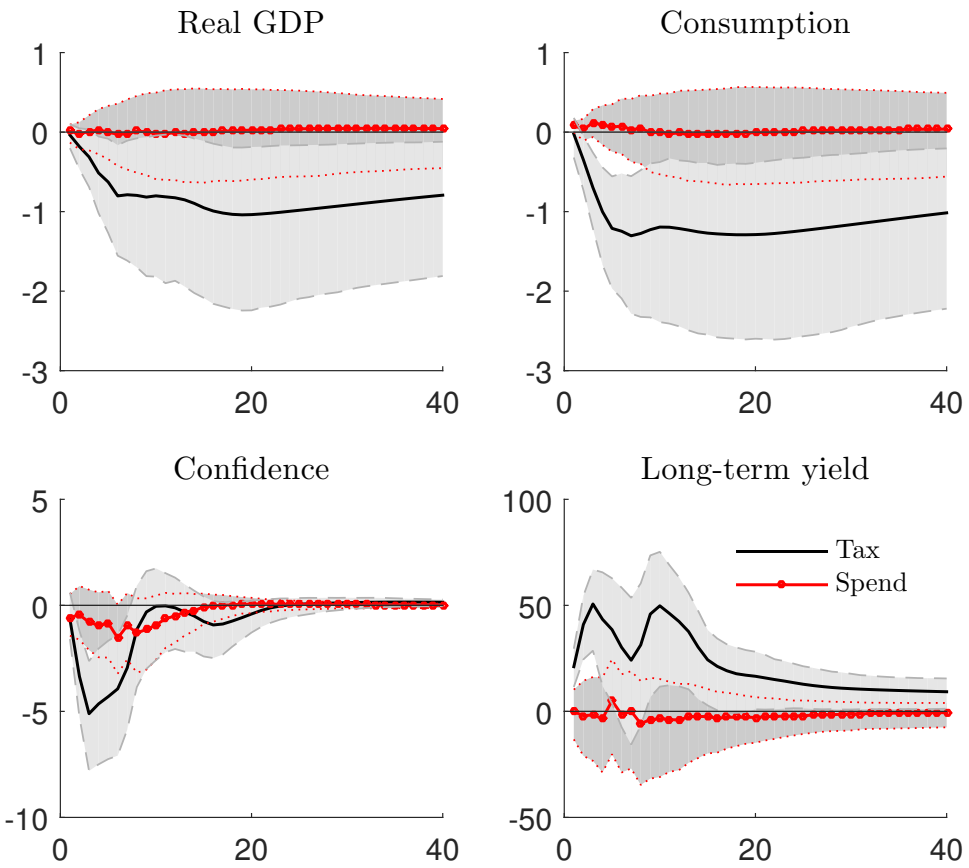
The impulse responses can be interpreted as percentage changes in the variables in reaction to a fiscal austerity announcement with a forecast impact on the primary balance of 1% of GDP. In the case of the long-term yield the effect is expressed as basis points. The confidence bands mark 90% statistical significance.

Our results are robust to the calendar-based timing of the announcements, the restriction of the sample to the years after the introduction of the euro (1999-2014) and to the period between 1978-1990. All in all, the findings show a drop in consumer confidence, an increase in bond yields and a drop in private consumption in response to an announcement shock.

Revenue-based and expenditure-based announcements

Previous empirical work finds evidence of an asymmetry between the effect of revenue- and expenditure-based consolidation measures on the components of output. We explore heterogeneity in the effect of these announcements by considering the value of fiscal announcements within each class of measures. For example, in the case of expenditure-based announcements we consider the estimated impact of the measures taken on the spending side, for all episodes where the measures on the spending side account for more than half of the total announcement.

Figure 2: Impulse responses: Revenue-based versus Expenditure-based announcements



The impulse responses can be interpreted as percentage changes in the variables in reaction to a fiscal austerity announcement with a forecast impact on the primary balance of 1% of GDP. In the case of the long-term yield the effect is expressed as basis points. The confidence bands mark 90% statistical significance.

The results in Figure 3 convey a marked difference between announced adjustments on the tax and the spending side. News about increases in taxes negatively affect confidence and exert upward pressure on the long-term government bond yield, while reductions in government expenditure do not appear to have a strong impact on expectational variables. The two variables respond instantaneously to the shock, and we find that an announced tax hike of 1% of GDP increases the long-term bond yield by approximately 20 basis points. Similarly, the negative impact of the austerity announcements on real variables seems driven by the communication of future tax increases: a year after the announcement, private consumption falls by over 1 percent and real GDP by approximately 0.75%.

As a robustness check, we estimate the VAR including the predicted impact of both revenue and expenditure measures and estimate the model with both components. We carry out this exercise separately for revenue-based and expenditure-based announcements. The results illustrate the general tendency for announcements to contain both classes of measures (each component reacts to a shock in the other type of measures). The responses of real variables remain robust and stronger in the case of revenue-based announcements. We find that for both

categories of announcements the tax component generates the drop in consumption and output.

6 The expectational transmission channel

In this section we quantify the importance of the expectations channel in the transmission of fiscal shocks to the real sector. By means of a counterfactual analysis, we gauge the extent to which the shock is transmitted through the variables that proxy for expectations. In orher words, we study the response of real variables in an environment where consumer confidence and/or long-term interest rates do not move at any horizon in response to fiscal announcement shocks.

Our approach to the counterfactual experiment involves the use of a single set of VAR estimates and the restriction of the impulse response of confidence to the announcement shocks. Thus we account for the presence of confidence in our economy when we conduct our counterfactual experiment. In both the baseline and the counterfactual case, the structural shocks are found by orthogonalizing a covariance matrix that includes confidence. However, in the construction of the counterfactual impulse responses to the orthogonalized announcement shock, we restrict the reaction of sentiment variables to be zero at all horizons. Thus, by restricting the impulse response rather than the coefficients we remain within the same environment and do not compare an economy with confidence to one where this is not part of the economic environment.[8]

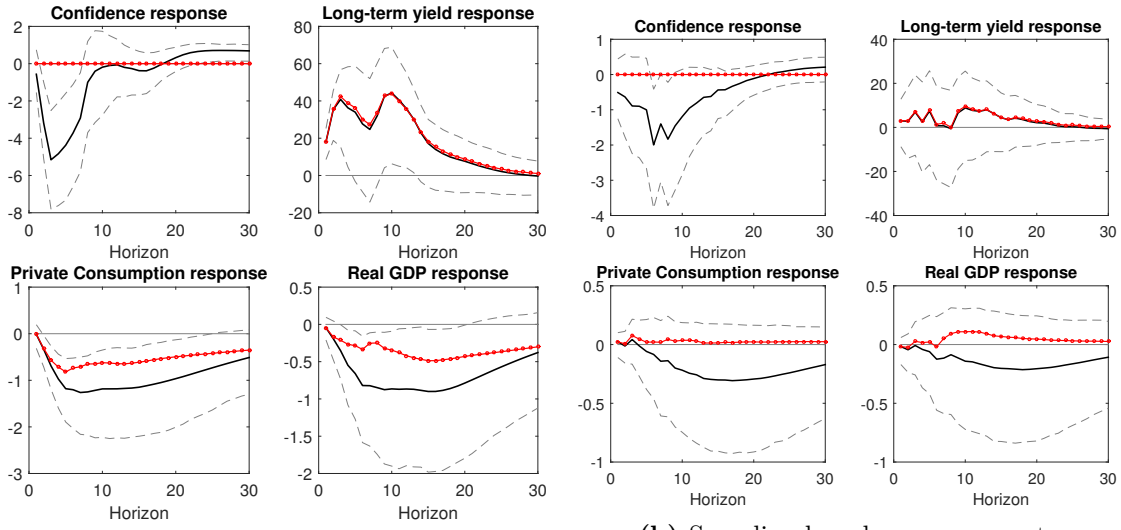
In this manner, we obtain "sentiment-free" responses of the variables of interest to fiscal announcement shocks. We turn off the consumer confidence channel and the bond yield channel succesively, and we experiment with a case where both variables are simultaneously restricted from reacting to the news shock.[9]

By restricting our confidence measure from reacting to the announcement shock we find that consumer sentiment accounts for about half of the response of private consumption and output, independent of the modality of the consolidation. However, announcements of tax increases have an independent effect on private consumption (strongest after about 3 quarters) and further, on output. Announcements of adjustment on the expenditure side of the budget generate no significant drop in either private consumption of GDP.

[8] Bachmann and Sims (2012) conduct a counterfactual experiment involving the creation of hypothetical confidence shocks which fully offset the reaction of confidence to the structural spending shock at each horizon. They mention that their approach produces similar results to the estimation of a restricted VAR where confidence would not react to the government spending shock and its autoregressive coefficient would be set to 0.

[9] We are aware that despite the utility of this counterfactual experiment, the approach is vulnerable to the "Lucas critique".

Figure 3: The consumer confidence channel



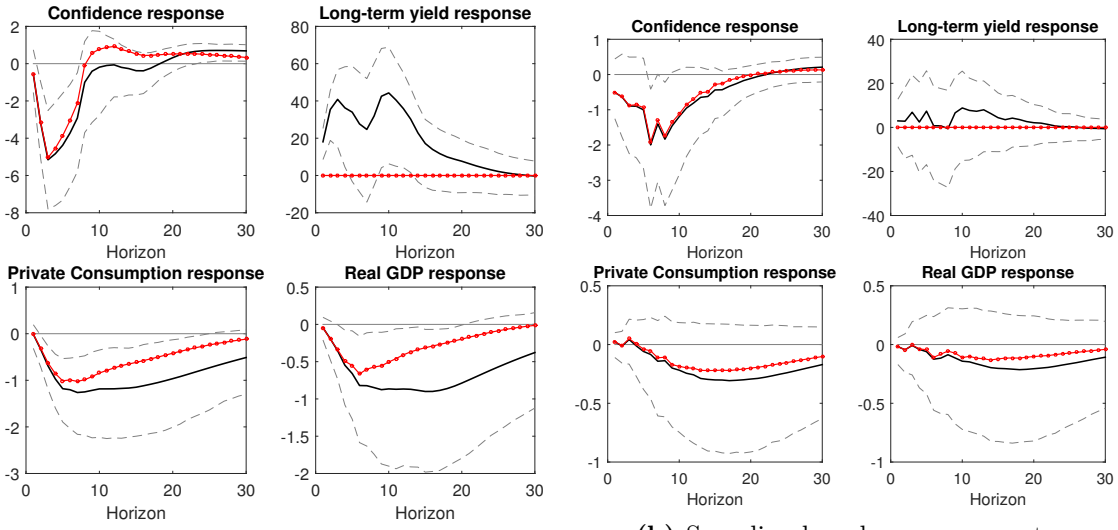
(a) Revenue-based announcements

(b) Spending-based announcements

The impulse responses can be interpreted as percentage changes in the variables in reaction to a fiscal austerity announcement with a forecast impact on the primary balance of 1% of GDP. In the case of the long-term yield the effect is expressed as basis points. The confidence bands mark 90% statistical significance.In the counterfactual estimation we restrict consumer confidence from responding to the fiscal announcement.

Further, we switch off the reaction of the long-term interest rate on government bonds to fiscal consolidation announcements. Given the rather muted reaction of interest rates to announcements of expenditure cuts, we find no evidence of a strong bond yield channel for this class of measures. However,in an economy where bond yields would not jump in response to announcements on tax increases, after the announcement shock private consumption and real GDP would rebound faster to their equilibrium values.

Figure 4: The bond yield channel



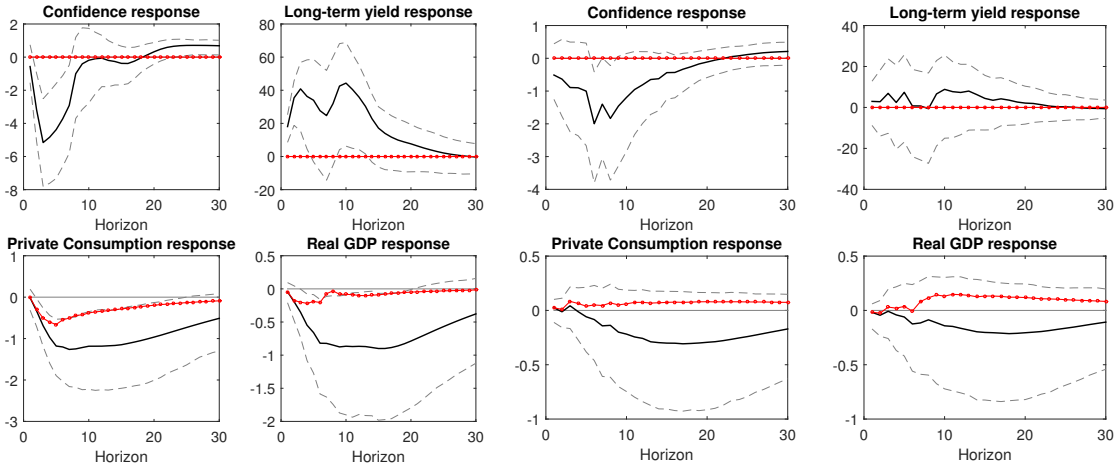
(a) Revenue-based announcements

(b) Spending-based announcements

The impulse responses can be interpreted as percentage changes in the variables in reaction to a fiscal austerity announcement with a forecast impact on the primary balance of 1% of GDP. In the case of the long-term yield the effect is expressed as basis points. The confidence bands mark 90% statistical significance. In the counterfactual estimation we restrict the long-term bond yield from responding to the fiscal announcement.

The findings bring evidence for the existence of expectational effects in the transmission of fiscal policy. However, in these experiments, the baseline and the counterfactual impulse responses are not statistically different from each other. In line with Bachmann and Sims (2012), we find that the consumer confidence channel amplifies fiscal news, However, its effect does not seem strong enough to account for a statistically significant share of the GDP response. Therefore, we go one step forward and assess whether the economy with sentiment (the combined reaction of consumer and investor confidence) reacts differently from an impassive economy in response to fiscal news.

Figure 5: The combined expectations channel



(a) Revenue-based announcements **(b)** Spending-based announcements

The impulse responses can be interpreted as percentage changes in the variables in reaction to a fiscal austerity announcement with a forecast impact on the primary balance of 1% of GDP. In the case of the long-term yield the effect is expressed as basis points. The confidence bands mark 90% statistical significance. In the counterfactual estimation we restrict both consumer confidence and the long-term bond yield from responding to the fiscal announcement.

While our conclusions do not change in the case of spending reductions, the combined effect of expectations plays a rather important role in the case of revenue-based adjustments, as the difference between the responses of the two economies is significant. Should consumer confidence not fall and long-term bond yields not rise in response to news of a tax hike, the drop in private consumption and real output would be halved. We consider this finding is an important illustration of the important role that expectations and sentiment play in shaping the effects of fiscal policy.

7 Conclusion

We measure the response of consumer confidence and bond yields to news about fiscal austerity measures, using a new monthly dataset of fiscal consolidation announcements.

While expenditure-based measures do not prompt a significant response of sentiment measures, revenue-based adjustments result in a sharp fall in consumer confidence in the two quarters following the announcement. In the baseline specification, our measure of confidence falls by 5% in the quarter following an announcement, while long-term bond yields increase by about 20 basis points on impact.

In general, we find that austerity announcements depress private consumption, producing a strong effect if they consist predominantly of tax increases. Although the decrease in consumption in response to revenue-based austerity may simply be a reaction to distortionary taxation, we find that consumer confidence amplifies the effects of austerity on private consumption.

Sentiment accounts for roughly half of the drop in spending prompted by an austerity announcement. While unaffected by announcements of spending cuts, long-term bond yields shoot up in reaction to news of revenue-based austerity. The combined effect of these two expectational variables accounts for a markedly different reaction of consumption and output to news of revenue-based austerity.

We find no trace of the 'confidence fairy' in the case of fiscal consolidations. Sentiment does affect private consumption, but the confidence channel seems to work in the opposite direction from the one suggested by advocates of 'expansionary austerity'. We do find support for the fact that the composition of the announcement matters: expenditure-driven austerity is less recessionary that revenue-based consolidations. Moreover, we find that this asymmetry cannot be fully explained by the different transmssion of shocks through the confidence channel. Long-term interest rates also play a role in the transmission of policy shocks to real variables, particularly if the austerity measures consist predominantly of tax increases.

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Appendix

Figure A1: Impulse response to a news shock in a more comprehensive model