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consumption in Europe: what have we
learned?

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Abstract

In this paper we contribute to the long literature on the effect of fiscal policy on the real economy. In particular, we focus on the effect of government consumption on private consumption for a pool of European economies. The results show that the effect is different when comparing the periods before and after 2008.

Keywords: Great Moderation, fiscal policy, crisis, private consumption

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In this paper we contribute to the long literature on the effect of fiscal policy on the real economy. In particular, we focus on the effect of government consumption on private consumption for a pool of European economies. The results show that the effect is different when comparing the periods before and after 2008.

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1. Introduction

There has been a quite significant degree of controversy on whether fiscal policy should be deployed in cases of recession. This reminds us of the austerity measures applied by many European countries after the 2012 sovereign crisis and the doubts casted about their effectiveness (Cuestas et al. 2019).

The current academic theoretical discussion about the effect of austerity measures lies on the Real Business Cycle (RBC) model. According to this, production is only determined by aggregate supply, which means that fiscal expansion would be negative for output due to the fact that government expenditure increases drain resources from the economy. However, this negative effect of expansionary fiscal policies does not have the same effect if we consider the dynamic RBC. In such a case, workers increase working hours to smooth consumption, hence increasing output. In the intertemporal RBC model, with nominal interest rates at the zero bound, according to Christiano et al. (2011), the magnitude of the fiscal multiplier is larger than one, implying that a fiscal contraction may be quite detrimental for output. The effect of the fiscal policy may be also dependent on the stance of the economy. Hence, the impact of the fiscal multiplier differs depending on whether the country's economy is increasing or decreasing (Perotti 1999), as fiscal expansions in recessions can be very painful (Bilbiie et al. 2014) and the multiplier tends to be larger during a financial crisis (Corsetti et al. 2013) but small or even negative in high-debt countries (Ilzetzki et al. 2013). This is important because many European countries, as aforementioned, apply fiscal contractions from 2012 in a very delicate moments of their economies.

The empirical literature on fiscal multipliers is huge (Huidrom et al. 2020), however, in this note the idea is to focus on the analysis of the effects of government consumption on private consumption, both as a percentage of the GDP. Although the empirical analysis of the effect of fiscal policy on GDP and unemployment is vast, there has been a lesser interest on the effect on consumption. In a recent contribution Cuestas and Ordóñez (2018) analyse the effect of fiscal policy on unemployment for a number of European economies. They find that during the 2008-2014 period, fiscal contractions were detrimental for unemployment. However, amid the COVID19 pandemic, there seems that private consumption does not quite catch up with pre-COVID19 in many European countries. The idea of this work is to shed some light on how expansionary fiscal policies can impact consumption in order to return to the pre-COVID19 expansion trends (Aikins Abakah et al. 2021).

We have selected a large panel of European countries (EU28 + Norway and Switzerland) and analyse what the impact of government consumptions shocks is on private consumption, for the period 1995-2021. In addition, we have divided the data in 2008, in order to assess differences pre and post Great Recession. The analysis is performed using cointegration techniques based on vector error correction models (VECM) (Johansen 1988, 1991) with impulse response analysis based on structural shocks. The analysis is performed as a panel.

Our results show that whereas fiscal policies were countercyclical before the Great Recession, the fiscal consolidation measures applied after the sovereign debt crisis show a procyclical behaviour of this variable. In addition, both before and after the beginning of the Great Recession fiscal stimulus has had a positive and significant impact on the importance of consumption on GDP.

The remainder of the paper is organised as follows. In the next section we summarise the empirical analysis and the results, and the last section concludes.

2. Empirical analysis

The data for this empirical analysis consists of quarterly observations of seasonally adjusted series of government consumption (G) and private consumption (C) both as percentage of the gross domestic product, from 1995Q1 until 2021Q3, downloaded from the *Eurostat* database. The countries selected are the former 28 member states of the European Union plus Norway and Switzerland due their close ties with the 28. As we can see in Figure 1, both variables seem to hold a clear co-movement over time, which could be a sign of the fact that both variables share a common stochastic trend.

Since the analysis is going to be performed as a panel, we first analyse the order of integration of the series by means of the Pesaran (2007) panel unit root test, which accounts for cross-sectional dependence. The results of the test are displayed in Table 1.

Table 1: Pesaran (2007) panel unit root tests

Statistic	t-stat	p-value
CIPS:	-1.79	>=0.10
Truncated CIPS:	-1.79	>=0.10

Critical values:		
Level	CIPS	Trunc. CIPS
1%	-2.30	-2.30
5%	-2.15	-2.15
10%	-2.08	-2.08

As the results in Table 1, the series as a whole are a unit root process, hence, to assess a relationship between the variables we need to rely on cointegration analysis.

Next, we assess the existence of cointegration by means of the Johansen's Trace and Lambda maximum tests, for a panel where we have included individual fixed effect dummy variables and no other deterministic component. The models are estimated with 4 lags. The results show that there exists cointegration between the variables. We have complemented this analysis with the residual based cointegration tests of Pedroni (1999) and Kao (1999).¹

The estimated VECM is shown in Table 2. As we see from the values of the loadings, both variables react to deviation from the long-run equilibrium and the variables hold a negative relation in the long-run, showing the countercyclicality of fiscal policy in this group of countries. However, due to the ignition of the Great Recession in 2008 these results may be unreliable due to the existence of significant instabilities and structural breaks.

¹ The results are available on request.

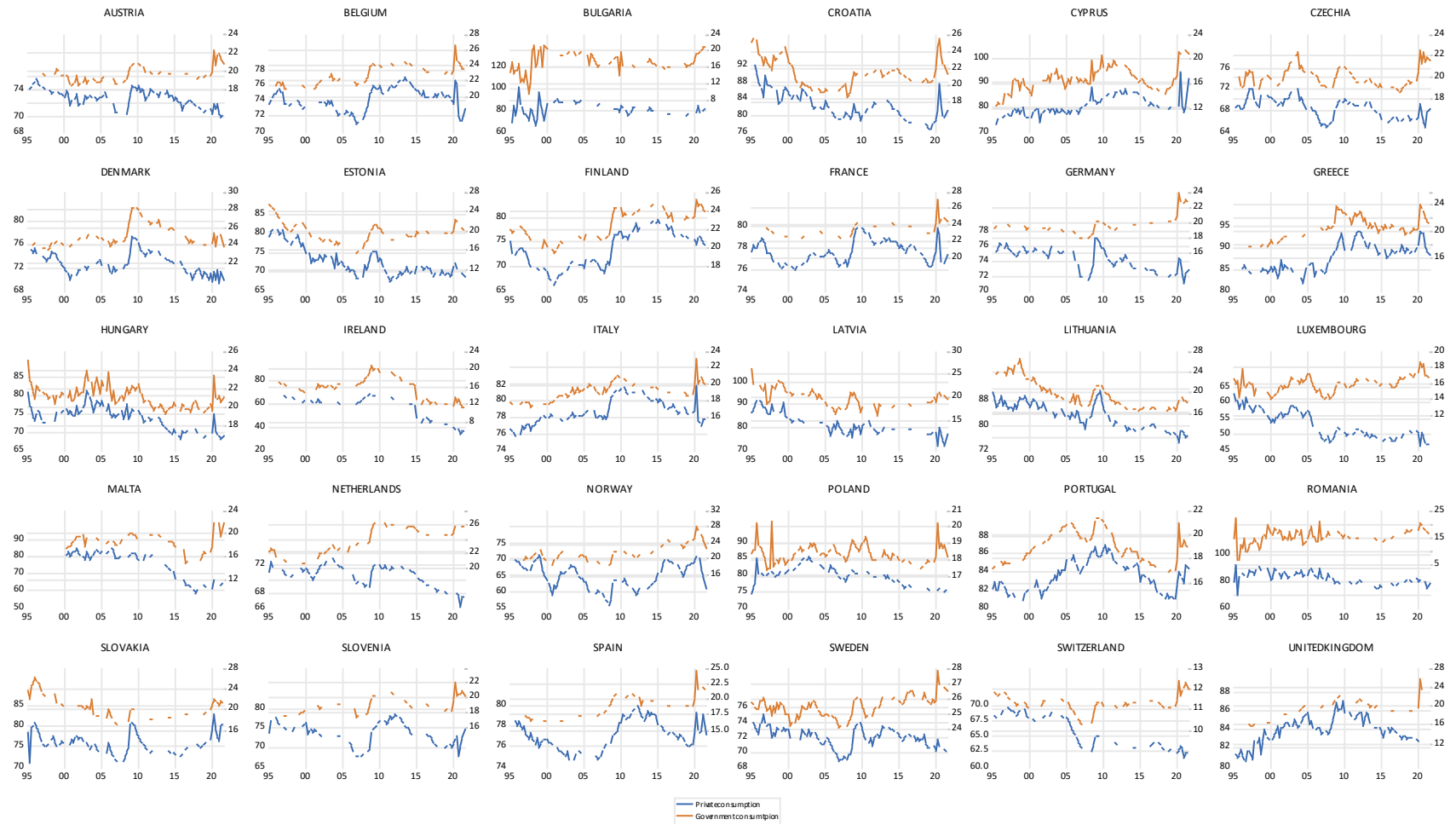


Figure 1: The data, left axis is % of private consumption/GDP and right is % of government consumption/GDP

Table 2: Cointegrating equations and loadings full sample

Cointegrating Eq:	CointEq1	
C_ ₍₋₁₎	1.00	
G_ ₍₋₁₎	17.94 (1.89) [9.44]	
Error Correction:	D(C __)	D(G __)
CointEq1	-0.003 (0.0009) [-3.80]	-0.004 (0.0004) [-10.11]

Note: In parentheses we report the standard errors and in brackets the t-ratios. To save space the estimations for the individual effects and the dynamics have not been included.

In the next step we estimate the model for the period before 2008Q1 and from there onwards in two different samples.

In Table 3 we report the results of the VECM estimations before the crisis. We observe that the coefficient of the long run relationship for government consumption is only significant at the 10% and that only private consumption corrects disequilibria from the long run equation. Note that since the coefficient of the loadings form $D(G_{-})$ is negative and $G_{(-1)}$ is also negative, these variable does not correct deviations from the cointegrating equation. We also plot, in Figure 2, the impulse response functions based on Cholesky decomposition, allowing for private consumption to react contemporaneously to government consumption shocks, but not vice versa.

Table 3: Cointegrating equations and loadings 1995Q1-2007Q4 sample

Cointegrating Eq:	CointEq1	
C_ ₍₋₁₎	1.00	
G_ ₍₋₁₎	-0.33 (0.19) [-1.74]	
Error Correction:	D(C __)	D(G __)
CointEq1	-0.17 (0.02) [-7.61]	-0.05 (0.01) [-4.36]

Note: In parentheses we report the standard errors and in brackets the t-ratios. To save space the estimations for the individual effects and the dynamics have not been included.

Response to Cholesky One S.D. (d.f. adjusted) Innovations
95% CI using Standard percentile bootstrap with 999 bootstrap repetitions

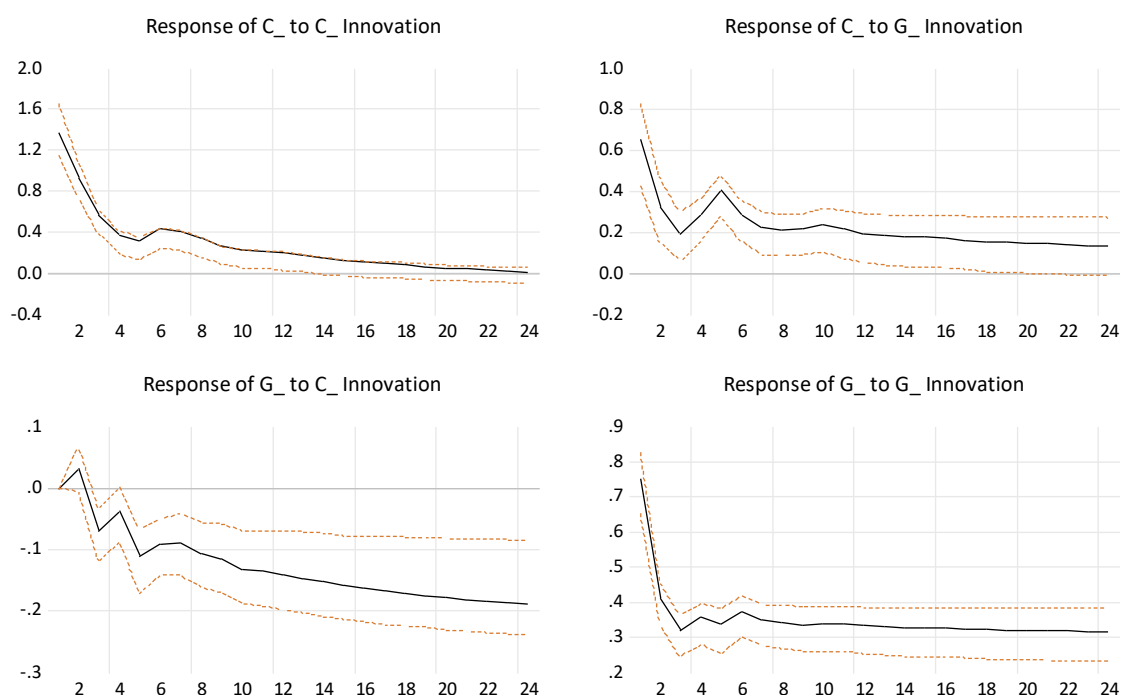


Figure 2: Impulse response functions, sample 1995Q1-2007Q4.

As we can see government spending shocks tend to have long lasting effects on private consumption, whereas the government consumption reaction is inverse to the sign of the private consumption shock.

Table 4: Cointegrating equations and loadings 2008Q1-2021Q3 sample

Cointegrating Eq:	CointEq1	
C_(-1)	1.00	
G_(-1)	-9.89 (0.83) [-11.85]	
Error Correction:	D(C_)	D(G_)
CointEq1	0.012 (0.003) [3.53]	0.016 (0.001) [9.54]

Note: In parentheses we report the standard errors and in brackets the t-ratios. To save space the estimations for the individual effects and the dynamics have not been included.

According to the estimations displayed in Table 4, there is a much stronger long run relationship between both variables, and unlike in the previous sample, is government consumption the variable reacting to disequilibria from the long-run relationship.

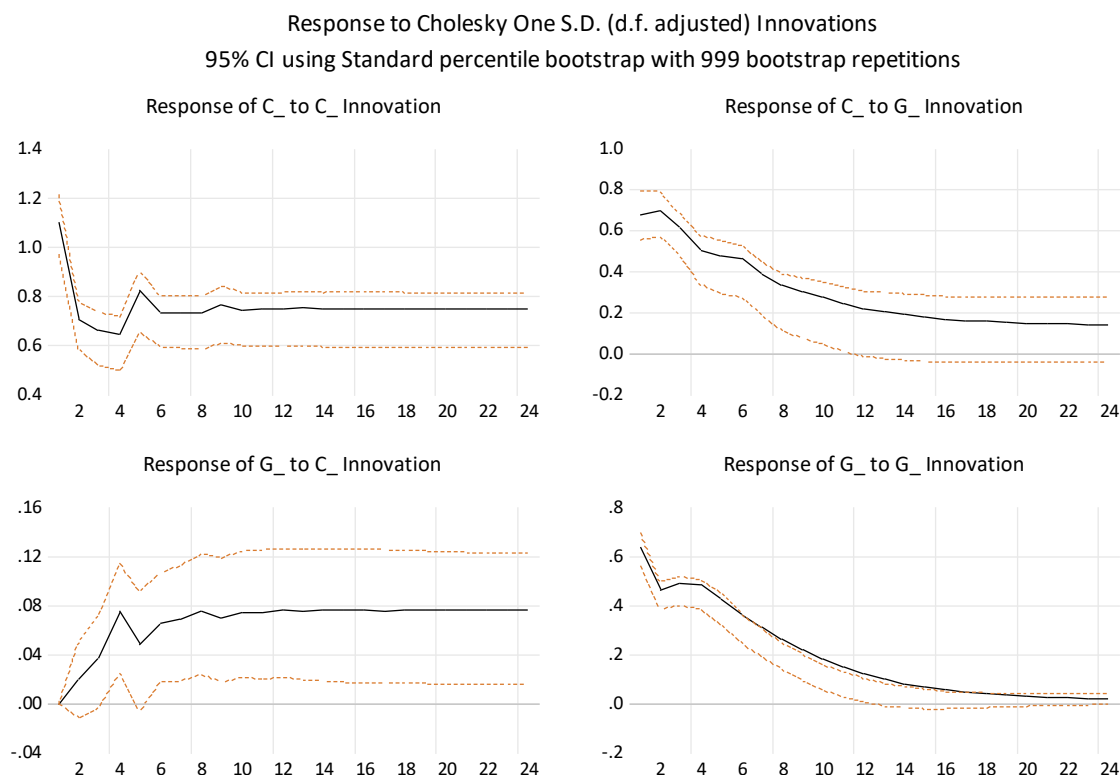


Figure 3: Impulse response functions, sample 2008Q1-2021Q3.

In Figure 3 we show the impulse response functions. The results show that whereas consumption shows a similar pattern than in the pre-crisis sample, government consumption reacts positively to positive private consumption shocks. This is not surprising as the second sample analysed coincides with the period when most countries applied fiscal consolidation measures in a period of deep drops in GDP as well as the importance of private consumption in overall income.

This highlights the importance of the fiscal policies to alleviate drops in consumption, and justifies the deployment of extraordinary measures for the recovery of Europe amid the COVID19 pandemic.

3. Conclusion

In this paper we have analysed the effect of government consumption on private consumption and vice versa, before and after 2008, which coincide the Great Moderation and beginning of the Great Recession, for a pool of European countries. Applying cointegration methods and estimating structural VECMs we find that the response of private consumption to government consumption shocks, for both before and after the crisis, is positive. However, during the Great Moderation we observe a countercyclical behaviour of government consumption, whereas the reaction of

government consumption after 2008 moves in the same direction as the sign of the private consumption shock. This shows the effect of austerity measures applied to the debt crisis due to the 2008-2010 Global Financial Crisis.

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