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Credit and the transmission of fiscal policy shocks: Recent evidence from Greece

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HIGHLIGHTS

- We examine the importance of credit for the transmission of fiscal policy shocks.
- Fiscal policy has more pronounced effects on the output when credit is constrained.
- Tax rather than spending shocks impact more heavily on the output when credit is constrained.

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ABSTRACT

Based on the SVAR approach we examine the importance of credit for the transmission of fiscal policy shocks in Greece. Fiscal shocks have more pronounced effects on the output when credit is constrained. Tax burden shocks have the most protracted effects.

1. Introduction

Greece is currently implementing a quite ambitious, EU-IMF financed, fiscal consolidation programme. Although the fiscal consolidation has been considered successful, it has come at a cost of a dramatic and continuing output contraction.[1] The IMF (2012) showed that fiscal multipliers have been underestimated in the recent years, implying that fiscal consolidation efforts had much deeper recessionary effects. However, the European Commission (2013a) and the ECB (2012) rebuffed the IMF methodology and findings. More recently, a new IMF report (IMF, 2013a) suggested that Greece might be faced with a so-called "credit-less recovery" in the next few years, indicating that growth will be weak as credit will continue shrinking up until 2015.

In this paper building on the SVAR approach we examine the role of credit in the transmission of fiscal policy shocks in Greece as a way of understanding the output effects of fiscal consolidation.[2] We consider a setting were credit to the non-financial private sector is restricted, i.e., not allowed to react to fiscal shocks at any horizon. The restricted case resembles a lot the current conditions in

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[1] The structural budget balance was reduced from −14.8% of GDP in 2009 to −1.0% of GDP in 2012 and to an estimated 1.2% in 2013, but the economy is expected to continue shrinking till 2013 (−4.9% in 2010, −7.1% in 2011, −6.4% in 2012 and −4.0% in 2013; European Commission, 2013b).

[2] Recent studies have shown that fiscal policy has more pronounced effect in times of binding credit constraints (see Tagkalakis, 2008; Aghion et al., 2009). Tagkalakis (2008) attributes that to the presence of tighter credit constraints in periods of economic decline. Economic activity has been declining since late 2008, however, due to data limitations we refrain from considering possible non-linear effects of fiscal policy in recession and expansions, i.e., the non-linear SVAR approach of Auerbach and Gorodnichenko (2012). Hence, we cannot discuss separately the effects of fiscal consolidation in periods of recession and expansions. However, credit has been continuously declining since 2011. Therefore, we do capture the inter-linkages between the economic activity, credit developments and fiscal policy highlighted in earlier studies (Tagkalakis, 2008; Aghion et al., 2009).

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Greece where credit is severely constrained.[3] Our findings indicate that fiscal policy has more pronounced and persistent effects on output when credit is restricted; the most pronounced effects are attributed to tax policy changes. The remainder of the paper proceeds as follows. Section 2 provides data information and discusses the baseline empirical model, and main findings. In Section 3 we present an extension of the model and summarize the key findings. Section 4 concludes.[4]

2. Data information and methodology

We use quarterly data from 2000:Q1 to 2013:Q1. Data were taken from the International Financial Statistics of the IMF (IMF, 2013b), the OECD Economic Outlook (OECD, 2013) and the Bank of Greece (2013).[5]

The point of departure in our analysis is to examine the impact of a 1% point (p.p.) increase in the primary balance-to-GDP ratio on output growth. As a second step we will examine the impact of government spending and tax burden on output growth.

The baseline specification incorporates the following variables: the primary balance-to-GDP ratio, the real long term interest rate, the growth rate of real credit directed to domestic households and non-financial corporations, and the real GDP growth rate. The variables are transformed in real terms by means of the GDP deflator.[6] In addition the baseline specification incorporates an intercept and the lag length is set to 1 based on relevant lag-length criteria and in order to obtain a parsimonious specification in view of the small sample size. In addition, the lagged value of the debt-to-GDP ratio is included as an exogenous variable in line with Favero and Giavazzi (2007) in order to control for constraints imposed on fiscal policy by the debt ratio (something particularly relevant for a high indebted country like Greece).

The baseline VAR we estimate is of the form:

$$X_t = A_1 * X_{t-1} + C_t + B * D_{t-1} + u_t \tag{1}$$

where $X_t = [pb, r,\ \text{credit}, y]$ is the vector of endogenous variables, C_t contains the deterministic terms and D_{t-1} is the debt to GDP ratio. u_t are the VAR innovations. Notice that credit enters before output in order to capture the impact of primary balance shock on output through the credit channel. In addition, the real long term interest rate is ordered before the credit variable following the vast monetary policy VAR literature (see, e.g. Christiano et al., 1998). This ordering captures the fact that the on-going fiscal consolidation can reduce the long-term interest rates that Greece is facing, lowering, thus, fiscal risks which can boost credit (from both internal and external sources) and facilitate the recovery.

Building on the Blanchard and Perotti (2002) SVAR approach we identify the structural shock to primary balance by imposing on the matrices A and B that determine the mapping from the VAR innovations u to the structural shocks ε ($Au_t = B\varepsilon_t$) the following restrictions:

$$\begin{vmatrix} 1 & 0 & 0 & \alpha_{pby} \\ \alpha_{21} & 1 & 0 & 0 \\ \alpha_{31} & \alpha_{32} & 1 & 0 \\ \alpha_{41} & \alpha_{42} & \alpha_{43} & 1 \end{vmatrix} \begin{vmatrix} u_{pbt} \\ u_{rt} \\ u_{crt} \\ u_{yt} \end{vmatrix} = \begin{vmatrix} \beta_{11} & 0 & 0 & 0 \\ 0 & \beta_{22} & 0 & 0 \\ 0 & 0 & \beta_{33} & 0 \\ 0 & 0 & 0 & \beta_{44} \end{vmatrix} \begin{vmatrix} \varepsilon_{pbt} \\ \varepsilon_{rt} \\ \varepsilon_{crt} \\ \varepsilon_{yt} \end{vmatrix}. \tag{2}$$

Following European Commission (2013c) we set $\alpha_{pby} = 0.5$.[7] If credit responds on impact to the primary balance shock then α_{31} should be non zero. The coefficient α_{43} captures the response of output to credit. Hence $\alpha_{31} * \alpha_{43}$ captures the effect of primary balance on output though the credit channel. The coefficient α_{41} reflects the direct response of output to primary balance shock.

The coefficient α_{32} captures the response of credit to the real interest rate, whereas α_{21} captures the direct effect of primary balance on the real interest rate. The product $\alpha_{21} * \alpha_{32} * \alpha_{43}$ reflects the indirect effect of primary balance on output through the real interest rate and credit.

By setting $\alpha_{31} = 0$ we assume that credit does not react on impact to a primary balance shock. In addition, by setting $\alpha_{32} = 0$ we assume that credit does not react to changes in real interest rate; we shut down a possible indirect effect of primary balance on output through the real interest rate and its effect on credit.[8] On the other hand, by allowing α_{21} to be non zero we allow for a direct primary balance effect on real interest rate and the subsequent indirect impact on output.

Moreover, by restricting the AR coefficients of lagged primary balance, real interest rate and output growth in the credit equation to zero we impose the constraint that credit does not respond to primary balance shocks at any horizon. In this so-called "restricted credit" specification the indirect effect of primary balance shocks on output through credit is being isolated.[9] This specification captures the following scenario: fiscal consolidation bears fruit in lowering real interest rates, however, credit remains non-responsive. As a next step we also consider the alternative "unrestricted credit" specification, where the above mentioned restrictions do not apply.

2.1. Baseline specification: findings

A primary balance shock depresses output growth in both the restricted (Fig. 1; orange line) and unrestricted (Fig. 1; red line) credit cases. However, the negative output response is more pronounced on impact and more protracted (taking longer to cross the

[3] Greek banks on account of PSI related losses were faced with depleting capital base; they received bridge recapitalization in spring 2012 and continued to receive liquidity assistance through the Bank of Greece and the Eurosystem. Moreover, since the onset of the crisis they faced deposit outflow and increasing NPLs (which reached at 29% in 2013 Q1 of total loans on a solo level, up from 24.2% at end 2012). As a consequence of all these factors y-o-y percentage change in the domestic credit to the private sector became negative in early 2011 and continued shrinking reaching −3.7% in end May 2013 (IMF, 2013c).

[4] A supplementary material appendix provides additional information on the main findings (see Appendix A).

[5] To correct for seasonal patterns in the quarterly data we have applied the census X12 filter.

[6] Both output and credit growth are in Δ log terms. We proxy the variable "credit" as follows: it is the sum of financing from domestic financial corporations directed to the domestic non-financial private sector (households and non-financial corporations) and financing received by domestic non-financial corporations and households from abroad. Data are taken from the Bank of Greece's Financial Accounts dataset (Bank of Greece, 2013). The following categories of financial liabilities are included: short and long term securities and short and long term loans from both financial corporations and the rest of the world.

[7] We account for the fact that a contemporaneous 1 p.p. decline (increase) in output reduces (increases) the primary balance by 0.5 p.p, of GDP. See European Commission (2013c), Table III.A1.1 (p. 145).

[8] This reflects the current experience in Greece where despite the significant fall in real long term rates (relative to the early crisis years) credit growth has not responded positively remaining in negative territory. As shown in European Commission (2013d) the Greek 10y bond yield spread and against the German bund has been declining reaching lows of 674 bps by end May 2013, i.e., a 36% reduction in the spread since December 2012. However, as the same report highlights the overall reduction interest rates have been accompanied by a continued deleveraging of the banking sector. Moreover, according to the IMF (2013a) the deleveraging process is expected to continue, with positive private sector credit growth being postponed for 2016.

[9] A similar exercise was conducted in Bachmann and Sims (2012) with the focus being on the role of confidence (see footnote 5 in p. 240).