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ABSTRACT

In this paper, we estimate the impact of a government spending shock, taking into account the financial conditions of the economy. We mainly focus on output responses with regards to the sign of the government spending shock. We first develop a simple theoretical model where we show how government spending interacts with financial conditions. More specifically, a contractionary policy worsens financial conditions while an expansionary policy eases them, affecting the size of the government spending multiplier. Our subsequent empirical analysis suggests that the multiplier of a negative spending shock is higher during financially stressful periods. A reduction in government spending during these periods has a large, negative, and long-lasting effect on output with a long-run multiplier of -1.79 . On the other hand, an increase in government spending results to a multiplier of 1.19 . In contrast, during financially tranquil periods, government spending multipliers are close to zero for both a positive and a negative shock. The main policy implication drawn from our findings is in favour of building up fiscal adjusters in normal times or pursuing front-loaded structural reform policies to avoid fiscal contraction when it is more painful.

1. Introduction

In recent years, the political and academic debate over the actual size of the fiscal multiplier (its impact on the real economy) has been revived. Following the Great Recession, public and private indebtedness significantly increased, whereas private demand decreased, thus raising questions about the nature of the optimal fiscal policy. In the relevant literature, two main perspectives exist regarding the size and the sign of the government spending multiplier. Advocates of fiscal expansions argue that this multiplier exceeds unity. In contrast, it is argued that the multiplier is near zero, in which case ‘expansionary’ austerity may restore a country’s market confidence. Most of these studies concentrate on the impact of fiscal policy shocks on the real economy. Thus, they consider existing economic developments as described by the phase of the business cycle, the fiscal state of the economy, or the conducted monetary policy. However, only a handful of empirical studies explore both the role of financial cycles and the sign of the fiscal shocks.

According to Keynesian and New Keynesian economics, increasing government expenditures and tax cuts directly affect disposable private income. As a result, economic stability and growth are restored in the

economy through the active demand channel. During a recession, government spending causes a much smaller crowding-out effect than it does in an expansionary period, which exerts a stronger impact on consumption and GDP (Woodford, 2011). Similarly, the government spending multiplier may also be higher during a recession if there are debt-constrained agents or tighter credit conditions (Eggertsson and Krugman, 2012; Aghion et al., 2009). In a different vein, Charles et al. (2015) propose the pro-cyclicality of a capitalist’s propensity for saving as a possible explanation for the higher fiscal multipliers during recessions.

In contrast, real business cycle (RBC) analysis finds that agents fully anticipate the future debt burden of the fiscal stimulus that accompanies higher taxes (the wealth effect). However, for intertemporal households, the current reduction in consumption makes the fiscal multiplier zero (Barro, 1974). This effect is most apparent during periods of growth (expansion), when the likelihood of more efficient resource usage (in terms of output) by the government is lower than it is during recessions. However, if liquidity constraints apply to a larger fraction of the population – often the case during recessions – the wealth effect of a fiscal policy is weaker than that during expansions, leading to large and positive Keynesian fiscal multipliers (Tagkalakis,

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2008; Canzoneri et al., 2016). Intuitively, fewer households participate in the financial market during a recession. Thus, their consumption depends on their disposable income rather than on the intertemporal substitution assumption.

In this study, we focus on government spending multipliers during financial cycles and consider the sign of the government shock. We consider the financial cycle as economic fluctuations that stem directly from the financial system. Financial cycles can influence the business cycle as shocks that originate in credit markets; they affect the phase of the business cycle through impacts on real economic developments (Helbling et al., 2011). In this vein, Bernanke et al. (1999) and Claessens et al. (2012), among others, find that recessions preceded by financial disruptions are typically more severe than those not preceded by financial disruptions. In their seminal paper, Kiyotaki and Moore (1997) argue ‘that durable assets play a dual role: not only are they factors of production, but they also serve as collateral for loans’. Thus, demand shocks can be amplified if the value of the collateral or the real value of nominal fixed debt changes. As a result, cyclical fluctuations driven by asset prices (also known as the financial cycle) may lead to higher booms and lower troughs than normal business cycles, possibly with more prolonged periods of boom and bust. Credit constraints and other financial imperfections may well put a significant drag on economic growth during a recovery period and, thus, it is expected that a government spending multiplier may be higher than it is during financially tranquil times.

We build on this literature to determine the size of the government spending multiplier during the financial cycle. We further argue that the size of this multiplier also depends on the sign of the government spending shock¹. Without altering the fundamentals of the model proposed by Eggertsson and Krugman (2012), we extend it to show that the effect of a negative fiscal policy shock during financial stress periods is higher than during a positive fiscal policy shock. Intuitively, the fraction of liquidity-constrained households affects the size of the fiscal multiplier. However, conversely, the fiscal shock may affect the fraction of constrained households. This contemporaneous feedback mechanism between fiscal shocks and households leads to asymmetric effects on the output from positive and negative fiscal shocks.

To the best of our knowledge, this is the first time that this argument has been posed explicitly. In most previous studies, financial frictions, such as liquidity-constrained households, act as initial conditions for the transmission of fiscal shocks (Tagkalakis, 2008; Angeletos and Panousi, 2009). However, as previously stated, these frictions might be determined endogenously by a fiscal shock. If true, the presence of financial frictions could alter the transmission mechanism of a fiscal shock and vice versa. Thus, the presence of financial frictions plays a key role in both state-dependent and sign-related fiscal multipliers (e.g. Gali et al., 2007; Tagkalakis, 2008; Angeletos and Panousi, 2009; Canzoneri et al., 2016; Eggertsson and Krugman, 2012).

Our analysis of the impact of the different signs and sizes of fiscal policy shocks is further justified by the empirical work of Riera-Crichton et al. (2015). The authors find that fiscal policy acts procyclically rather than counter-cyclically in many OECD countries.² Thus, when an economy is in a recession, government spending decreases and vice versa. As noted by Riera-Crichton et al. (2015), if this pattern is not considered in empirical models, then the estimated fiscal multipliers may be severely biased.

The empirical model used in this study is based on a threshold structural VAR model (TSVAR) and includes generalized impulse

response functions (GIRF) with a Cholesky identification scheme of the responses. However, we build the GIRFs by allowing the system to move freely between regimes after a fiscal shock is realized in the economy. As an indicator of the financial cycle (and, thus, as a threshold in our TSVAR model), we use the Chicago FED non-financial leverage sub-index (NFCLS).³ The index ‘is a combination of household and non-financial business leverage measures, that proved to serve consistently as a leading indicator for upcoming financial and economic activity stress periods’ (Brave and Butters, 2011).⁴ We also consider the Chicago FED National Activity Index (CFNAI) as a transition variable (Candelon and Lieb, 2013) to compare our findings with those of prior studies that estimate fiscal shocks on the basis of the different states of the business cycle.

Our results show that under financial stress, the multipliers are higher than under periods of financial stability, a finding that is in line with the empirical results of other studies. Most importantly, we find that a negative fiscal shock has a stronger impact than a positive shock during financial stress periods, whereas the negative impact is also more persistent over time. This result is in accordance with our theoretical findings. Finally, the estimated multipliers are higher than unity, in absolute terms, only during periods of financial stress. During tranquil times, the fiscal multipliers are extremely small and, in many cases, not statistically significant. These results contribute indirectly to the widely cited recent academic dispute over the necessity and outcomes of austerity measures (Alesina and Ardagna, 2010; Guajardo et al., 2014; Jorda and Taylor, 2015; Mencinger et al., 2017). We argue that building up fiscal adjusters in normal times or pursuing front-loaded structural reform policies should be preferred over fiscal contractions because the latter is more painful.

The remainder of this paper is organized as follows. Section 2 describes the stylized facts on which our empirical research is based. Section 3 reviews the related literature. In Section 4, we analyse the theoretical model, and in Section 5, we describe the data and the model employed in this study. Section 6 discusses our empirical results. Lastly, Section 7 proposes some policy implications and concludes the paper.

2. Stylized facts

Following Riera-Crichton et al. (2015), we briefly discuss the counter-cyclical or pro-cyclical character of the fiscal policy employed in the United States during the study period. As previously argued, many studies show that business and financial cycles interact. Thus, Table 1 is divided into two panels and reports the percentage of the fiscal policy employed relative to the phases of the financial and business cycles (panels A and B, respectively). The expansionary and the contractionary fiscal policy states are characterized by higher or lower than the long-run trend when government spending, respectively. For instance, in cell (1,1) of Panel A, in 28.8% of each case, the U.S. economy is expanding, whereas government spending is decreasing (i.e. a counter-cyclical fiscal policy). Thus, the sum of cells (1,1) and (2,2) represents the overall percentage of the conducted counter-cyclical fiscal policy (i.e. almost 56% of all quarters), and in 44% of all cases, the U.S. economy experienced pro-cyclical fiscal policies. The same holds for the financial cycle (panel B).

Although the percentages related to the counter-cyclical policy are higher in panel A, in 40% of all cases, the U.S. economy experienced pro-cyclical fiscal policies. These observations motivate us to examine potential non-linearities in the impact of positive and negative fiscal policy shocks.

Brave and Butters (2011) suggest that the NFCLS sub-index acts as

¹ Possible asymmetries in the impact of fiscal multipliers may arise for many reasons. Interesting studies estimate the different impacts between tax cuts and government spending (Jha et al., 2014; Mountford and Uhlig, 2009). Asymmetries can also be estimated between anticipated and unanticipated fiscal shocks (Cavallari and Romano, 2017).

² For more details, please refer to Table 1 in the section on stylized facts.

³ To the best of our knowledge, this is the first time this index has been used in such a framework.

⁴ Please refer to the Section 5.1 for a detailed description of the financial index.

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