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Fiscal policy interventions at the zero lower bound

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ABSTRACT

We build on a New Keynesian Dynamic Stochastic General Equilibrium (DSGE) model to explore the macroeconomic consequences of fiscal expansionary shocks during the economic crisis of 2008 in the eurozone. In this setting, we find that the big four eurozone economies (France, Germany, Italy, and Spain) can effectively escape from their liquidity trap through fiscal policy interventions caused by government purchases. We estimate the government spending multiplier to be above 1.8 when this policy is associated with a long-term commitment to keeping the nominal interest rate at the zero lower bound, as suggested by Krugman (1998). Notably, the short-term deficit effect on the budget balance can be offset five years after the implementation of a large spending program. We also show that alternative policies with tax cuts that expand the supply do not appear to have the same power in the short run. Moreover, we provide novel empirical evidence that a large government debt renders a government spending policy ineffective.

1. Introduction

> It would be extremely helpful if central banks could count on other policymakers, particularly fiscal policymakers, to take on some of the burden of stabilizing the economy during the next recession.[1]
>
> (Ben S. Bernanke)

The financial crisis of 2008 led to a global recession and to an intense debate about the limitations of monetary policy and the effectiveness of fiscal stimuli. After years of massive stimulus policies with nominal interest rates at the zero lower bound from the major central banks in the United States, Europe, and Japan, inflation remains stubbornly low and the global economies have not recovered as much as expected. As stated by the former Federal Reserve Chair Ben Bernanke at the Brookings Institute, and as highlighted a few weeks later by the European Central Bank (ECB) Chair Mario Draghi, central banks are close to the limits of what their stimulus policies (widely known as quantitative easing) can achieve;

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[1] Article in the Brookings Institute blog, September 13, 2016, entitled "Modifying the Fed's policy framework: Does a higher inflation target beat negative interest rates?" https://www.brookings.edu/blog/ben-bernanke/2016/09/13/modifying-the-feds-policy-framework-does-a-higher-inflation-target-beat-negative-interest-rates/.

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therefore, fiscal policymakers have to take action and complement these policies.[2] Notably, Japan recently applied large fiscal expansions but failed to stimulate the demand and to escape from its liquidity trap.

Consequently, the effectiveness of the expansionary fiscal policy has been challenged and questioned. What is the effect of a government spending shock? How does the output respond to a tax cut when the interest rates are at the zero lower bound? How does the fiscal multiplier change when the zero bound is not binding? The answers from the existing literature are not conclusive. While some authors, such as Cogan et al. (2010), find a multiplier below unity from a New Keynesian model, others, such as Ramey (2011a), predict the multiplier to be above 1.0, depending on the timing. Additionally, Christiano et al. (2011) document that the government spending multiplier is above 1.0 when the central bank commits to constant interest rates over the long run and below 1.0 otherwise.

The debate is especially intense in Europe, where, quite recently, though without success since growth remains anemic, the ECB ramped up its stimulus program repeatedly by cutting deposit interest rates even below zero and accelerating its monthly bond purchase program.[3] Should eurozone economies have adopted a more aggressive unconventional fiscal policy to boost growth? How do tax cuts and government spending affect their economic growth under the actual economic circumstances? In this paper, we address these critical issues by examining the effectiveness of a government spending shock and an income tax cut at the zero lower bound to provide novel empirical evidence for the four largest eurozone economies, namely Germany, France, Italy, and Spain. We also compare the findings obtained with those of a positive nominal interest rate policy to determine how the fiscal multiplier changes in a distinctively different interest rate setting.

We build our theoretical framework on a New Keynesian dynamic stochastic general equilibrium (DSGE) model developed by Eggertsson (2010) and extended by Denes et al. (2013), in which they examine the effects of government purchase shocks and tax cuts on the stimulation of an economy when the zero lower bound is binding. In the model, the economy is subject to government spending and tax cut shocks, while the nominal interest rate is allowed to remain at the zero lower bound and does not respond to changes in the fiscal policy. The long-term commitment to generating inflation by keeping the nominal interest rate constant at the zero lower bound is similar in spirit to Christiano et al. (2011). Accordingly, the model allows us to use a strict Taylor rule policy. Under this rule the expansionary policy shock creates inflation and leads to higher interest rates. when the nominal interest rate rises in response to an expansionary policy shock, which creates inflation. Another key assumption is that lump sum taxes are used to budget the government balance and to finance government spending. Our work modifies some of the theoretical assumptions of Eggertsson (2010) and Denes et al. (2013), such as tax cuts and the inflation rate at the zero lower bound, and focuses on the short- and medium-run effects of these policies on the stimulation of growth. Notably, only two previous empirical papers estimate fiscal multipliers at the zero lower bound (Ramey, 2011a for the United States; Crafts and Mills, 2013 for the United Kingdom), and only one compares the differences between the zero lower bound and the positive nominal interest rate policies in the United States (Ramey and Zubairy, forthcoming).[4] In addition, our paper contributes to the standard fiscal multiplier literature by showing that the government spending multiplier is larger than 1.0 and that tax cuts fail to stimulate growth effectively in the big four eurozone economies. Most estimates of the multiplier in previous studies are between 0.5 and 0.8 (e.g., Cogan et al., 2010; Beetsma and Giuliodori, 2011).

At the calibration stage, we empirically map the New Keynesian DSGE model into a state-space model that allows for a structural vector autoregressive (SVAR) analysis with macroeconomic variables and exogenous shocks. This approach is similar in spirit to the methods proposed by Blanchard and Perotti (2002) and Beetsma and Giuliodori (2011). We particularly examine the effects of government spending and tax cuts in three scenarios: (i) the interest rate is at the zero lower bound but following the change in fiscal policy in that the nominal interest rate rises and the zero lower bound does not bind; (ii) the interest rate is at the zero lower bound and does not respond to the fiscal policy shocks, and hence the zero bound is binding from the short to the medium term; (iii) there is a government budget constraint that does not allow the government balance to exceed the 3.0% deficit due to a large government debt in the first year of government fiscal intervention.

We show that a positive shock to government spending (investment and consumption) can stimulate the eurozone economies effectively. In particular, when the nominal interest rate is at the zero lower bound and does not respond to government spending shocks and to an increase in inflation, the government spending multiplier becomes almost twice as large, since it is estimated to be higher than 1.8 for all four eurozone economies. In this scenario, the central bank focuses purely on stimulating the output, future inflation is allowed to increase, and the zero lower bound is binding from the short to the medium term, resembling the paradox of thrift as analyzed by Keynes (1936). As a result, the short-run effects on the output with a zero interest rate policy are substantially affected by the long-run expectation that the nominal interest rates will stay at the zero lower bound. Krugman (1998) suggests that policy commitments to keeping the interest rate at zero for a longer period, compared with the no-commitment policy, is an effective way to stimulate an economy.

[2] Remarks in the European Parliament, Brussels, September 25, 2016. https://www.ecb.europa.eu/press/key/date/2016/html/sp160926_2.en.html.

[3] See Joyce et al. (2012) for an analysis of the European Central Bank (ECB) quantitative easing program, Eser and Schwaab (2016) for a detailed discussion on the securities market program employed by the ECB, and Boubaker et al. (2017) on the role of unconventional monetary policies in risk and asset allocation decisions.

[4] In a related study, Leeper et al. (2010) use a neoclassical growth model to identify the effectiveness of an expansionary fiscal policy when it dynamically adjusts to the level of economic activity and to changes in the level of government debt. However, their work does not consider the interactions between fiscal policy and monetary policy, particularly when the nominal interest rate is near or at the zero lower bound.

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