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Financial frictions and optimal stabilization policy in a monetary union

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ABSTRACT

Financial frictions differ across countries and thus cause international differences in the transmission of shocks. This paper shows how the optimal mix of monetary and fiscal policy depends on these country-specific financial frictions. To this end, we build a two-country DSGE-model of a monetary union. Financial frictions are captured by the cost channel approach. We show that the traditional solution to the assignment problem – the common central bank stabilizes the inflation rate at the union level and the national fiscal authorities stabilize the national economies – does not hold in a world with financial frictions. The cost channel decreases the efficiency of monetary policy and increases the need for fiscal stabilization even at the union level. Moreover, the more heterogeneous the union, the more important is fiscal policy in stabilizing shocks. Finally, we evaluate the scenarios in terms of welfare of the representative household.

1. Introduction

Monetary policy stabilizes the inflation rate at the union level and fiscal policy stabilizes the national economies - this is the traditional solution to the assignment problem in a monetary union (see, for example, Beetsma and Jensen, 2005; Gali and Monacelli, 2008). By deriving this result, the models typically abstract from imperfections in the process of financial intermediation. The recent financial crisis, however, has shown that such imperfections are not negligible and that they can damage the macroeconomic performance of an economy. In this paper, we reconsider the assignment problem and show that the described solution does not hold in a world with financial frictions. Financial frictions decrease the efficiency of monetary policy in combating inflation, which in turn increases the need for fiscal stabilization even at the union level.

The microeconomic rationale for the disruption of financial intermediation and/or a country-specific financial architecture is well-known: information asymmetries between lenders and borrowers, costly verification of financial contracts, bankruptcies, contagions etc. (see, e.g., Bernanke et al., 1999; Carlstrom et al., 2010; Lombardo and McAdam, 2012; Brunnermeier et al., 2013; Brzoza-Brzezina et al., 2013). Due to these imperfections, a credit spread where the borrowing rate exceeds the riskless interest rate and a supply-side effect of monetary policy arise. If firms need to finance their operations by borrowing funds from financial intermediaries, any change in the borrowing rate will translate into changes in the firms' marginal costs. By influencing the borrowing rate the nominal interest rate set by the central bank appears in the Phillips curve. Our modelling approach does not take a stand on the concrete form of the financial friction. Since almost all imperfections generate a credit spread and a supply-side effect, we choose a reduced form, namely the cost channel approach introduced by Ravenna and Walsh (2006).

A growing number of empirical studies estimate the extent of the interest rate effect on marginal costs in the U.S. and the Euro area. Chowdhury et al. (2006) find the range of the cost channel coefficient to lie approximately between 0.2 (France), 1.3 (the U.S.) and 1.5 (Italy). This is in accordance with estimates by Ravenna and Walsh (2006) who find a cost channel of 1.276 for the U.S. Henzel et al. (2009) also provide supportive evidence for a significant cost channel in the Euro area. Tillmann (2009a) finds that the coefficient for the U.S. follows a U-shaped pattern. The cost channel was most important in the pre-Volcker era and less important in the Volcker-Greenspan period. De Fiore and Tristani (2013) argue that the cost channel gained quantitative importance during the recent financial crisis. The conclusion from all these studies is twofold, the cost channel is quantitative important and the strength varies across countries and over time. A country-specific cost channel may serve as an example of the national idiosyncracies, which create asymmetries in the transmission of common shocks in the Euro area (see, e.g., Rafiq and Mallick, 2008).

We base our analysis on a stylized New Keynesian dynamic

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stochastic general equilibrium (DSGE) model for a monetary union, which consists of two countries that differ from each other with respect to the strength of the cost channel. Our work is akin to Michaelis and Palek (2016), who find that both demand and supply shocks can generate sizable welfare losses in the presence of a cost channel differential. Monetary policy is too blunt an instrument to tackle these shocks effectively. In this paper, we enrich the toolkit of stabilization policy by adding a national instrument, government spending. We show that not only the decrease in monetary efficiency can be (partially) compensated, but also the cost channel differential can be treated appropriately by the use of the national fiscal instrument. We describe the rich interaction between these two tools of stabilization policy. One aspect which turns out to be important: introducing a government sector minors the efficiency of monetary policy to influence aggregate demand, since the interest rate affects only consumption and consumption is now only a fraction of aggregate demand. Moreover, because of a fiscal gap, the use of government spending as a stabilization tool induces a welfare loss per se. In this paper we derive the welfare-maximizing policy response to demand and supply shocks.

Ravenna and Walsh (2006) are the first to implement the cost channel in the New Keynesian framework of a closed economy. They show that under optimal monetary policy, the output gap and inflation are allowed to fluctuate in response to both productivity and demand shocks. Tillmann (2009b) introduces uncertainty about the true size of the cost channel to the model of Ravenna and Walsh (2006). With an uncertain cost channel, the monetary authority tends to overestimate the cost-push effect of an interest rate hike which leads to a less aggressive interest rate response. Lam (2010), Demirel (2013) as well as Michaelis and Palek (2016) show that the value of a commitment technology of monetary policy is increasing in the size of the cost channel. Ali and Anwar (2013) focus on supply shocks, they compare three monetary policy rules in terms of welfare. Their main result: a Taylor rule performs worse than monetary commitment and inflation targeting.

Since the creation of the European Monetary Union (EMU), a large number of researches investigated the role and interaction of the central bank and fiscal authorities within the currency union. One part of the literature focuses on strategic interaction between policymakers: Dixit and Lambertini (2001, 2003) study the policy mix in a game theoretical framework, when the (adhoc) objective function between the policymakers differs. Disagreement on a common objective leads to an inefficient inflation/output outcome. Agreement on an ideal level of output and inflation leads to ideal outcomes, irrespective of which authority moves first and despite any disagreement on the relative weights of the target variables. Andersen (2005) studies the policy-mix problem when the central bank follows a strict inflation targeting policy and fiscal policymakers act strategically. He finds that there are large coordination problems with respect to aggregate shocks which increase the need of policy coordination. In Chortareas and Mavrodimitrakis (2016), fiscal policy has a strategic advantage by moving first. This ordering of moves prevents the common central bank from fully stabilizing even pure aggregate demand shocks.

Another strand of literature examines the joint optimization by monetary and fiscal authorities in the context of micro-founded models with derived loss functions. Beetsma and Jensen (2005) set the stage. Monetary policy should stabilize the aggregate economy while fiscal policy ought to be utilized for stabilizing the national economies. This result is confirmed by Gali and Monacelli (2008). Ferrero (2009) goes one step further by introducing a government budget constraint. He shows that a balanced budget rule generates welfare losses. Allowing for variations in government debt instead, is a superior policy. Kirsanova et al. (2007) also consider a government budget constraint but focus on simple fiscal policy rules rather than optimal fiscal policy. The use of fiscal policy as a stabilization tool does not harm the longer term objective of keeping public debt under control.

Only a few papers study optimal monetary policy in a model with micro-founded financial frictions. In Cúrdia and Woodford (2010) a credit spread arises because of heterogeneity in households' spending opportunities, in De Fiore and Tristani (2013) credit frictions arise because of heterogeneity and asymmetric information in firms' productivity. Both papers show that a credit spread reduces welfare, but when changes in the spread are exogenous (or the spread is insensitive to mild economic fluctuations), then the optimal target criterion remains the same as in a model without a credit spread. Badarau and Levieuge (2011) analyse a two-country monetary union with heterogeneous national banking structures. They demonstrate how a symmetric shock causes cyclical divergences inside the monetary union. In Badarau and Levieuge (2013) the authors extend their framework by introducing monetary policy and various budget policy scenarios. They show that decentralized budgetary policies need to be more proactive in countries which are structurally more sensitive to shocks.

In this paper we show how the optimal policy mix depends critically on the size of the cost channel (credit spread). The emergence of the cost channel makes the central bank generally less aggressive since the fiscal authority supports the monetary policymaker in stabilizing macroeconomic fluctuations. The larger the cost channel, the stronger the fiscal reaction must be. Fiscal policy gains even greater importance when an inflation differential occurs due to a relative shock, an idiosyncratic shock or a cost channel differential. Further, we show that in presence of a cost channel, the nominal interest rate may turn into a supply-side instrument. Finally, we compare the optimal policy mix under discretion with the optimal policy under commitment. Under commitment, even a relatively small cost channel turns the nominal interest rate into a supply-side instrument. In this case, the availability of fiscal policy leads to welfare gains, which increase in the strength of the cost channel. This is in sharp contrast to discretion. Here, welfare losses are always increasing in the size of the cost channel.

The organization of the paper is as follows. In Section 2 we outline our model; the building blocks are the IS relation, the government budget constraint and the Phillips curve. Section 3 frames the joint policy problem of the monetary and fiscal authority. In Section 4, we present and discuss the inflation and output dynamics of various shocks. As our analysis will show, the nominal interest rate may turn into a supply-side instrument in the presence of a cost channel. In Section 5 we therefore discuss the determinants of this feature. Section 6 compares the inflation/output dynamics of shocks and the welfare consequences of optimal policy under discretion with optimal policy under commitment. Section 7 concludes.

2. The model

Our model is a two-country version of a monetary union, extended to include a public sector where government spending is financed either by lump-sum or distortionary taxes. Besides the union monetary policy, the national fiscal policies act as additional stabilization tools. Hence, fiscal authorities may vary government spending when facing shocks. Goods markets are characterized by monopolistic competition and price rigidity. All goods are traded and labor serves as the only production factor. Besides these New Keynesian features, we incorporate country-specific cost channels as done by Michaelis and Palek (2016).

2.1. Optimal consumption choices

There is a continuum of households in the union on the interval $[0, 1]$. The population of the segment $[0, n)$ belongs to (H)ome, while the population of $[n, 1]$ belongs to (F)oreign. The representative infinitely-lived household j in country i will seek to maximize the following objective function