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Macroprudential regulation, credit spreads and the role of monetary policy☆

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ABSTRACT

We study the macroprudential roles of bank capital regulation and monetary policy in a borrowing cost channel model with endogenous financial frictions, driven by credit risk, bank losses and bank capital costs. These frictions induce financial accelerator mechanisms and motivate the examination of a macroprudential toolkit. Following credit shocks, countercyclical regulation is more effective than monetary policy in promoting price, financial and macroeconomic stability. For supply shocks, combining macroprudential regulation with a stronger anti-inflationary policy stance is optimal. The findings emphasize the importance of the Basel III accords in alleviating the output-inflation trade-off faced by central banks, and cast doubt on the desirability of conventional (and unconventional) Taylor rules during periods of financial distress.

1. Introduction

The global financial crisis of 2007–2009 followed by the Great Recession have emphasized the importance of developing macroeconomic models studying the interactions between the financial system and real economy. In the aftermath of the crisis, it is now clear that restrictions in lending, higher borrowing costs and financial regulation, all of which directly impact the credit markets, have translated into distortions in the wider economy. Subsequently, a growing number of research papers and policy discussions on the role of banking, credit risk and bank capital in the transmission of demand, supply and importantly financial shocks to the real economy have emerged in the past few years.[1]

The general consensus in the literature is that credit market frictions and risk sensitive bank capital regulation (in the form of Basel II) can exacerbate procyclicality in the financial system and real economy (see Covas and Fujita, 2010; Liu and Seeiso, 2012; Angeloni and Faia, 2013 for Basel II procyclicality). These potential adverse consequences have led to a substantial shift in the policy debate, which now not only focuses on the banks' individual solvency captured by bank adequacy requirements (microprudential policies), but also on the role of macroprudential tools in

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[1] Meh and Moran (2010) and Gerali et al. (2010) examine the role of bank capital in propagating various shocks. Jermann and Quadrini (2012) and Christiano et al. (2014), on the other hand, focus on the direct effects financial shocks have on the macroeconomy. These authors find that different types of financial shocks are important for explaining the dynamics of real variables.

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preventing and managing the build-up of financial imbalances. The new Basel III Accords, set to be fully implemented by 2018, intend to enforce banks to increase the quality of their assets, raise the capital adequacy ratio, hold countercyclical bank capital buffers and set loan loss provisions in a timely manner before credit risk materializes (see Basel Committee of Banking Supervision (BCBS) (2011) for further details). The objectives of the Basel III regulatory measures are to enhance financial stability, encourage more restricted lending in economic booms, mitigate systemic risk and allow the financial sector to better absorb losses associated with an eruption of a negative credit cycle.

Beyond the direct reforms Basel III imposes on the global banking system, can countercyclical bank capital buffers, which rise during economic upturns and thus limit credit growth, also promote overall macroeconomic and price stability? While these objectives are not officially part of the banking regulation agenda (as opposed to protecting the banking sector against future losses), it is clear that with the undeniable link between the financial sector and real economy, banking regulation may have also sizeable macroeconomic effects. The question addressed is whether Basel III-type regulation can contain the negative adverse spillovers flowing from the financial sector to the real economy? In this context, we also need to comprehend the effectiveness of monetary policy rules in achieving price and output stability when credit market frictions and regulatory requirements prevail.

This paper contributes to the growing macrofinance literature by promoting a further understanding on financial-real sector linkages, and examining the welfare implications and interactions between bank capital regulation and monetary policy in a Dynamic Stochastic General Equilibrium (DSGE) model with nominal rigidities, a borrowing cost channel and endogenous financial frictions. These market imperfections include collateralized lending, financial regulation, risk of default at the firm level, and ex-ante commercial bank losses.[2] The necessity for Basel II type bank capital adequacy requirements is to absorb banking sector losses, which guarantees deposits are repaid in full. At the same time, credit risk induces further bank capital losses, resulting in an increase in the cost of bank capital as well as stricter regulatory requirements (under Basel II), both of which lead to higher borrowing costs. As in Ravenna and Walsh (2006) and De Fiore and Tristani (2013), firms in this setup must borrow from commercial banks to finance their labour costs. Therefore, the refinance rate, bank capital regulation and the various credit market frictions described above (all of which endogenously impact the lending rate and financial market conditions) translate also into changes in the behaviour of the marginal cost, price inflation, wage inflation and output through the borrowing cost channel.[3] Building on this literature, the borrowing cost channel in our model is enhanced by a richer banking environment, regulatory requirements and various credit frictions, which can explain important links between the financial sector, inflation and the real business cycle.[4]

Compared to the majority of the macrofinance literature, where credit lines are used to finance house purchase and investment in physical capital, we pursue a different approach and indeed introduce loans to finance labour costs. This modeling viewpoint is motivated by recent evidence which suggests that variations in working-capital loans following adverse financial shocks can have persistent negative effects on the economic activity (see Fernandez-Corugedo et al., 2011 who estimate the cost channel for the U.K. economy and Christiano et al., 2015 who estimate this channel for the U.S.). This result, therefore, requires the examination of macroprudential policies when firms rely on external finance to support their production activities.

The simulated model shows that countercyclical financial regulation (Basel III) is very effective at fostering financial and price stability, whereas credit spread-augmented Taylor rules increase price and wage inflation volatilities, and thus provide zero welfare gains. From a policy perspective we conclude that: (a) If the economy is hit by credit shocks, then by setting bank capital requirements responding countercyclically to credit risk, regulatory authorities can achieve the anti-inflation target of monetary policy as well as eliminate welfare losses (comprised of variances in price inflation, the output gap and the wage inflation gap). In this state, the output-price inflation-wage inflation tradeoff is minimized and monetary policy rules become redundant since optimal monetary policy suggests leaving the refinance rate unchanged; (b) Following technology shocks, aggressive macroprudential regulation can restore a more hawkish stance of monetary policy, which in combination yield the highest welfare gain. Under these conditions, central banks can contribute further to price stability through the standard demand channel of monetary policy without amplifying inflationary pressures via the monetary policy cost channel. Financial distortions, countercyclical regulation and different types of shocks therefore significantly alter the transmission mechanism of monetary policy and its optimal behaviour.

This paper is also related to the following strands of literature. First, it contributes to Agénor and Aizenman (1998) and its New Keynesian counterpart framework developed in Agénor et al. (2014), by introducing a rationale for bank capital (and explicitly modeling its costs), ex-ante default costs in the banking sector, financial risk shocks originating in the banking system, countercyclical bank capital regulation and a credit spread-augmented type monetary policy rule. More specifically, we evaluate optimal macroprudential and monetary policy rules in a simple framework capable of generating a negative relationship between the loan rate spread and GDP, without relying on the costly state verification mechanism and borrowers' net worth used in the Bernanke et al. (1999) financial accelerator type models.[5] In fact, the additional financial imperfections and Basel II type regulatory rules introduced in our model amplify the countercyclical correlation between output and borrowing costs, and induce further financial accelerator effects via the borrowing cost channel. The relatively small scale nature of our setup also allows us to clearly disentangle and intuitively demonstrate the different transmission mechanisms linking the credit market conditions to the macroeconomy, and to explain the implications for optimal simple policy rules and welfare.

Second, this paper relates to recent contributions that have studied the interaction between macroprudential regulation and

[2] We use bank losses and default costs in the banking sector interchangeably throughout the paper.

[3] Indeed, we refer to this channel as the "borrowing cost channel" and not the standard "cost channel of monetary transmission" as is common in this literature. The "cost channel of monetary policy", affected by changes in the policy rate, is only part of the wider "borrowing cost channel", which in our model is driven mostly by regulatory requirements and credit market frictions.

[4] In a recent contribution which abstracts from credit default risk, De Paoli and Paustian (2013) also use the borrowing cost channel (loans for working-capital needs) to study the optimal interaction between macroprudential regulation (defined by a cyclical tax on the borrowing of firms) and monetary policy under discretion and commitment. We instead focus on optimal simple implementable rules, with monetary policy defined by a Taylor rule, and macroprudential regulation operated through countercyclical bank capital requirements. See also Agénor and Pereira da Silva (2014) who examine the interaction between macroprudential policy (in the form of cyclical required reserves) and monetary policy within a simple deterministic macro model featuring a cost channel.

[5] Most empirical evidence show a strong negative relationship between loan rate spreads and GDP fluctuations (see Nolan and Thoenissen, 2009; Gerali et al., 2010 for example).