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Should monetary policy lean against the wind? An analysis based on a DSGE model with banking

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ABSTRACT

The global financial crisis has reaffirmed the importance of financial factors for macroeconomic fluctuations. Recent work has shown how the conventional pre-crisis prescription that monetary policy should pay no attention to financial variables over and above their effects on inflation may no longer be valid in models that consider frictions in financial intermediation (Cúrdia and Woodford, 2009). This paper analyzes whether Taylor rules augmented with asset prices and credit can improve upon a standard rule both in terms of macroeconomic stabilization and of agents' welfare in a DSGE with both a firms' *balance-sheet channel* and a *bank-lending channel* and in which the spread between lending and policy rates endogenously depends on banks' leverage. The main result is that, even in a model in which financial stability does not represent a distinctive policy objective, leaning-against-the-wind policies are desirable in the case of supply side shocks, while strict inflation targeting and a standard rule are less effective. The gains are amplified if the economy is characterized by high private sector indebtedness. Robustness shows that the interaction between financial frictions and debt-deflation effects is potentially very powerful.

1. Introduction

Before the global financial crisis the consensus view on the conduct of monetary policy was that the central bank should pay no attention to financial variables over and above their effects on inflation; an aggressive inflation-targeting policy was considered sufficient to guarantee macroeconomic stability. This conclusion emerged from a debate which focused exclusively on how central banks should deal with asset price bubbles and relied on several arguments explaining why monetary policy was, at best, ineffective.[1] The theoretical underpinnings of the pre-crisis consensus were the works by Bernanke and Gertler (2000, 2001), Gilchrist and Leahy (2002) and Iacoviello (2005). A crucial characteristic of these papers is that their results are based on models that consider financial frictions only on the *borrowers'side* of credit markets. Credit-supply effects stemming from financial intermediaries' behaviour were completely neglected.

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[1] These arguments consisted in the inability of the central bank to correctly identify bubbles, the lack of effectiveness of the policy rate as an instrument to contain asset price movements and the idea that a strong easing of policy would be sufficient to "clean up" after the burst of a bubble (Mishkin, 2011).

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The financial crisis has instead shown how shifts in credit supply can indeed have a crucial role in macroeconomic fluctuations. Empirical research has pointed out how in many advanced economies loose credit conditions have contributed to amplifying the business cycle prior to the financial crisis, while the tightening of lending standards in the aftermath of the Lehman's collapse has contributed to the strong decline in output recorded in 2008–2009 (Adrian and Shin, 2010; Ciccarelli et al., 2010; Gilchrist et al., 2009). More recently, fears of a credit crunch have resurged in connection with the European sovereign debt crisis (Draghi, 2011). Theoretical analysis has turned its attention to the implications of the credit-supply channel for the conduct of monetary policy (Meh and Moran, 2010; Gertler and Karadi, 2012); recent work that considers financial frictions on the *side of lenders* has stressed how "*decisions about interest-rate policy should take account of changes in financial conditions*" (Woodford, 2011, p. 39). After the crisis, policymakers have also reconsidered the so-called "Greenspan doctrine", i.e., the prescription that asset prices should have no role in the conduct of monetary policy over and above that implied by their foreseeable effect on inflation and employment (Mishkin, 2011).[2]

In a formal characterization of these ideas, Cúrdia and Woodford (2009, 2010) (henceforth CW) have introduced, in an otherwise standard New Keynesian model, an ad hoc friction in financial intermediation that gives rise to a spread between the loan and the policy rate. In that context, they have shown that—despite standard optimal policy prescriptions continue to hold—spread- or credit-augmented rules are a better approximation to the optimal policy than the standard Taylor rule for a number of different shocks.[3]

Taking stock of this debate, in this paper we ask if "*leaning-against-the-wind*" (henceforth LATW)—defined as monetary policy following an "augmented" Taylor rule, which takes into account asset prices or credit—may improve upon a standard rule in the context of a model that combines frictions on *both* the borrowers' and the lenders' side; in our model, in particular, loan spreads endogenously depend on banks' leverage. Our main contribution to the existing literature is thus to analyze how different instrument rules perform in a model with the simultaneous presence of a borrower balance-sheet and a bank credit-supply channel. In doing so we show that, when credit supply effects are present, responding to financial variables allows the central bank to achieve a better trade-off between inflation and output stabilization and improves both households' and entrepreneurs' welfare; we thus corroborate CW's results using a richer model of the financial sector and analyzing a different range of financial variables that the central bank might want to look at.

Our model is a simplified version of Gerali et al. (2010), who estimated a medium-scale model for the euro area. In particular, we share with that paper the main characteristics of the financial sector. A *bank lending channel* arises due to the presence of a target level for banks' leverage; as a consequence, the loan-supply schedule is positively sloped and shifts procyclically with changes in the policy rate and with banks' profitability and capital. As pointed out by Woodford (2011), a loan supply curve with these characteristics could be motivated in several ways. For example intermediaries may have costs for originating and servicing loans, with marginal costs increasing with the volume of lending; or leverage could be bounded by regulatory limits or market-based constraints. The *balance-sheet channel* is modelled along the lines of Iacoviello (2005), assuming that entrepreneurs' borrowing capacity is linked to the value of the assets that they can pledge as collateral. On the other hand, the fact that we use a simplified (and calibrated) version of Gerali et al. (2010) implies that our quantitative results should be take with caution; indeed, we aim at obtaining qualitative indications on whether LATW may improve macroeconomic stabilization in a model that provides a sufficiently rich representation of the credit market.

Our analysis focuses on aggregate supply shocks, which create a trade-off for a central bank that aims at stabilizing output and inflation since, conditional on the shocks, the two variables tend to move in opposite directions. On the one hand, this choice helps us showing how the presence of financial frictions may amplify financial cycle fluctuations—with an effect on macroeconomic stability—even during "normal times". On the other hand, this choice limits the scope of the paper, as it does not allow the model to account for periods of financial distress. In particular, the model cannot explain the genesis of the Great Recession for which demand effects have likely been far more important than supply side effects.

Our main results support the view that LATW is indeed desirable when the economy is driven by supply side shocks, while both strict inflation targeting and a standard Taylor rule are less effective. Consider first strict inflation targeting or, equivalently, a standard rule with a very aggressive response to inflation. In this case, the strong response to inflation reduces inflation volatility less than it increases that of output, due to the impact of policy rates on credit-market developments. Following a positive technology shock, for example, this type of policy calls for a reduction of the policy rate, which tends to counteract the fall in consumer prices. In the presence of a broad credit channel, however, the easing of policy has a very strong expansionary effect on output, due to its impact on asset prices and loan supply, which in turn sustains a boom in consumption and investment by borrowing agents. In one word, this type of rules implies that monetary policy is "too loose" in the face of a positive supply shock, generating a procyclical behaviour by financial sector variables which, in turn, amplifies volatility in the real economy. Consider now a standard rule with a non-negligible response to output or with a response to financial variables. In this case, the response of monetary policy is less accommodative,

[2] In this respect, evidence is mixed. Borio and Lowe (2004) find that the response is asymmetrical to the build-up and unwinding of financial imbalances. Some papers show that the Federal Reserve adjusted interest rates in response to equity price misalignments and changes in bank capital requirements even in the pre-crisis period (Cecchetti, 2003; Cecchetti and Li, 2008).

[3] In particular, CW find that the linear relation that should be maintained between the inflation rate and changes in the output gap, i.e. the so-called "target criterion", which characterizes optimal policy in the basic NK model, continues to provide a good approximation to optimal policy, even in the presence of variations in credit spreads. In their setting, considering a spread-adjusted Taylor rule improves upon an unadjusted Taylor rule, though it remains inferior to the target criterion cited above.