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# Monetary transmission under competing corporate finance regimes☆

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A B S T R A C T

The behavioral agent-based framework of De Grauwe and Gerba (2015) is extended to allow for a counterfactual exercise on the role of corporate finance arrangements for monetary transmission. Two alternative firm financial frictions are independently introduced: market-based and bank-based. We find convincing evidence that the overall monetary transmission channel is stronger in the bank-based system compared to the market-based. While the growth in credit is larger in the market-based system, uncertainty originated from imperfect beliefs produce impulse responses in macroeconomic variables that are, on average, half of those in the bank-based model. At the same time we find mixed results on the conditional effectiveness of monetary policy to offset contractions. Conditional on being in a recession, a monetary expansion in a market-based system creates higher successive booms. That said, a monetary easing in the bank-based system is more effective in smoothening the financial-and business cycles.

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## Transmisión monetaria bajo regímenes alternativos de finanzas corporativas

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R E S U M E N

El modelo de comportamiento basado en agentes de De Grauwe y Gerba (2015) se extiende para permitir un ejercicio contrafactual del papel que desempeñan los acuerdos financieros corporativos para la transmisión monetaria. Se analizan de manera independiente dos fricciones financieras alternativas sobre las firmas: la basada en el mercado y la basada en la banca. Se encuentran pruebas convincentes de que el canal de transmisión monetaria en su conjunto es más fuerte en el sistema basado en la banca que aquel basado en el mercado. Si bien crece más el crédito en el sistema basado en el mercado, la incertidumbre generada por las creencias imperfectas produce impulsos respuesta en las variables macroeconómicas que son, en promedio, la mitad de las del modelo basado en la banca. Al mismo tiempo, se encuentran resultados mixtos en la eficacia condicional de la política monetaria para contarrestar las contracciones. Bajo la condición de encontrarse en una recesión, una expansión monetaria dentro de un sistema basado en el mercado crea unos auges sucesivos mayores. Dicho esto, la expansión monetaria es más eficaz en el sistema basado en la banca a la hora de suavizar los ciclos financiero y económico.

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## 1. Motivation

There is a long line of empirical research highlighting a strong link between firm characteristics, corporate finance structure and monetary policy transmission. Those studies show that the effectiveness of monetary policy and the asymmetric impact it will have on the economy over expansions vs recessions is dependent on the type of firms in the economy and their financing composition. Under the current context of unconventional policies understanding this link has become even more urgent. Despite the enormous amount of liquidity injected by central banks, SMEs continue to face many difficulties to access credit. This is true for both the UK and Euro Area (EA). For others, such as the US these difficulties have been much less acute. For emerging markets, access to firm credit is still very problematic despite largely using conventional monetary policy tools. Yet, all these countries have very different corporate financing systems, and their central banks have adopted very different monetary policy. At the same time, their markets are at very different levels of market confidence. For this reason it is important to understand the interaction between monetary policy, market sentiments and credit supply, and examine whether the observed disparity in monetary policy effectiveness to boost credit and economic activity depends on the type of financial frictions in an economy.

We incorporate these components in our analysis and examine the role of monetary policy in boosting activity under competing financial regimes. In particular, we focus on two alternatives: one where firms receive external finances from the market market-based financing or MBF), and another where they receive it from banks (bank-based financing or BBF). We include each regime in separate but otherwise identical New-Keynesian models with price rigidities, a borrowing constraint for firms, financial frictions on the supply side and imperfect credit and capital markets. Borrowing constraint of firms has significant aggregate effects via the usual demand-channel, but also a more elaborated supply-channel via imperfect capital markets. In each version, firms can only access one type of external finance. This assumption makes the model more tractable and assists in making our key findings more understandable at the expense of making it somewhat less realistic. Further, we relax the rational expectations assumption and introduce behavioral dynamics of De Grauwe (2011) and De Grauwe and Gerba (2015).

Using the models, we wish to answer a number of questions. First, we wish to structurally uncover whether the source of corporate credit and the type of credit channel matters for monetary transmission. Second, we wish to examine the role of imperfect beliefs and stock markets for credit- and business cycle fluctuations. Finally, our ultimate aim is to answer a broader (long-standing) issue of whether monetary policy is more effective in generating and sustaining booms in a MBF or a BBF system. In other words, is the transmission of monetary policy to firm credit greater and smoother in one financial system compared to the other. This debate is nested within a larger contemporary debate of whether MBF systems cause larger economic instability and make monetary policy less effective in counteracting those. Therefore, by comparing two alternative yet pure financial regimes, we wish to highlight the contribution of each to economic (in)stability, and effectively examine the role that monetary policy has to play for relaxing credit access and smoothen business cycle fluctuations. Moreover, in the context of emerging markets, we hope that our findings will contribute to the debate of whether these should adopt market-based financing structure in order to relax credit access to firms, boost growth and improve the workings of monetary policy.

In the impulse response analysis, we find that a credit boom caused by a monetary expansion is stronger in a market-based system. The interaction between the actual drop in interest rate with positive market outlook relaxes the credit constraint more than proportionally. That said, the impulse response estimates in the MBF version are much wider which implies that there is a non-negligible probability of the credit expansion being smaller than in the BBF version. It mainly depends on the strength of the initial animal spirit channel.

The macroeconomic effects from this expansion, on the other hand, are stronger in the bank-based version. This is because less of the market uncertainty is passed through to the real economy, which allows it to expand more. In some sense, the marginal benefit of a unit of credit is higher in a bank-based financing system.

Interactions between market beliefs and financial frictions can potentially generate high amplitudes in the financial and business cycles. Longer expansions are followed by even deeper recessions. The heavy contractions are observed in standard macroeconomic as well as financial variables. In addition, cycles are asymmetric around the zero-line. Compared to rational expectations models, this is possible to generate because of the additional uncertainty (or friction) originating from imperfect beliefs.

One level down, these fluctuations (and asymmetries) are higher for financial variables in the BBF, while they are higher for macroeconomic variables in the MBF. This means that even if the additional banking friction in the BBF model generates greater fluctuations in the credit variables, the pass-through to the real economy is smoother. Banks absorb some of that volatility using their capital buffers. In the MBF version, on the other hand, that volatility is directly passed on to borrowers, who include them in their intertemporal decision-making.

To conclude, we evaluate the effect of monetary expansions conditional on the economy being in a recession. While interest rate cuts are more frequent and larger in the BBF model, the total effect on output is more modest. Capital restrictions and the limited influence of market sentiment in loan supply decisions limit the full-fledged expansionary effects from interest rate cuts compared to the MBF model. Then again, if the aim of monetary policy is to reduce the volatility in the economy (for financial or consumption smoothing purposes), then a monetary policy in the BBF model accomplishes this objective in a more effective way.

### *1.1. Literature review*

The current bulk of empirical literature can be summarized into two strands. The first strand examines the mutual links between firm characteristics and monetary transmission via the loan supply and bank incentive channel. Kashyap and Stein (2000) argue that when a central bank tightens policy, aggregate bank lending falls and a substitution towards non-bank financing, such as commercial paper takes place. As a result, aggregate investment falls by more than would be predicted simply by a rise in bank interest rates. This is because small firms that do not have significant buffer cash holdings are forced to reduce investment around periods of tight credit. Similarly, small banks seem more prone to reduce lending compared to large ones due to a lower securities buffers.[1] In a similar vein, Ehrmann, Gambacorta, Martínez-Pagés, Sevestre, and Worms (2001) show in a pan-European study that monetary policy alters loan supply by affecting the liquidity levels of individual banks. Contrary to the US evidence in Kashyap and Stein (2000), however, they do not find that the size of banks explain its lending reaction.

[1] Kashyap, Stein, and Wilcox (1996) extend their initial study above and show that even when the level effect is accounted for so that large (small) firms increase (reduce) all types of financing during a monetary tightening, there is a considerable substitution away from bank loans towards commercial paper. Calomiris, Himmelberg, and Wachtel, 1995, June and Ludvigson (1998) reach the same conclusion.

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