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journal homepage: [www.elsevier.com/locate/jme](http://www.elsevier.com/locate/jme)Monetary policy and regional availability of debt financing<sup>☆</sup>Massimo Massa<sup>a,1</sup>, Lei Zhang<sup>b,\*</sup><sup>a</sup> INSEAD, Boulevard de Constance, 77305, Fontainebleau, France<sup>b</sup> Nanyang Business School, Nanyang Technological University, 50 Nanyang Avenue, Singapore 639798, Singapore

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## ABSTRACT

The relative availability of bond and bank financing should affect the firm's external financing and investment decisions. We define a measure that proxies for the regional borrowing inflexibility to substitute between bank and bond financing: "debt inflexibility". Debt inflexibility tilts the firm's financial structure towards equity and reduces investment. The impact is stronger during the period of tight monetary policy, particularly for smaller firms and firms without banking relationships. Debt inflexibility increases the sensitivity of cash holdings to cash flows, reduces the likelihood of dividend payment and makes the firm more likely to pay equity in mergers and acquisitions.

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## 1. Introduction

The credit (bank lending) channel view of monetary policy posits that changes in the money supply can affect the real economy thanks to financial frictions that help to transmit restrictions in the availability of credit (e.g., Kashyap et al., 1993; Kashyap and Stein, 1995, 2000). A monetary policy contraction shrinks the banks' balance sheets and reduces the supply of bank loans. For this to have an impact on the real economy, firms must find it difficult to replace bank loans with other sources of financing. The inability to replace loans with other sources of financing allows a contraction of monetary policy not only to reduce the credit supply but also to widen the wedge between the opportunity cost of internal funds and the cost of external funds, reducing investment.

Kashyap et al. (1993) write: "There are two necessary conditions that must be satisfied in order for monetary policy to affect the economy through a lending channel. First, banks must view loans and securities as imperfect substitutes on the asset side of their balance sheets, so that monetary tightening does indeed reduce the supply of bank loans. Second, loans and nonbank sources of finance must also be imperfect substitutes for firms on the liability side of their balance sheets, so that reduced loan supply has real effects". They provide supporting evidence for this view by showing that loans and non-bank financing are insufficient substitutes and this lowers investment during monetary policy contractions.

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This gives a paramount role to the frictions that reduce the substitutability between bank and non-bank financing. In this paper, we focus on frictions related to the geographic segmentation of the credit market. These frictions limit the firm's ability to substitute bank loans with another type of debt financing: corporate bonds.

While corporate bonds are an important source of debt financing for a wider spectrum of firms, the substitutability between bank loans and bonds is limited (Kashyap et al., 1993; Faulkender and Petersen, 2005; Leary, 2009; Lemmon and Roberts, 2010). The inability to substitute bank loans with bonds may be related to firm-specific conditions or market-related frictions. The former has been identified with asymmetric information or imperfect contract enforceability (Diamond, 1991; Rajan, 1992). This paper focuses on the latter—i.e., a particular type of market-related friction: the geography-constrained ability of the firm to substitute loans with bonds. The hypothesis is that the credit market is segmented and that, depending on where the firm is located, the inability to substitute bank financing with bond financing can bite differently.

We start from two stylized facts: local bias and market segmentation. There is ample empirical evidence suggesting that both bank financing and bond financing are locally driven. In the case of banks, proximity lending is related to a better ability to screen and monitor the lender (Petersen and Rajan, 2002; Degryse and Ongena, 2005; Agarwal and Hauswald, 2010), whereas in the case of market-based financing—the local bias of institutional investors can be justified in terms of either better information (Coval and Moskowitz, 2001, Baik et al., 2010) or familiarity (Huberman, 2001). The second stylized fact is that the debt market is segmented and that bond and bank debt are not close substitutes.

Local bias implies that in regions in which there is a scarce presence of institutional investors there is limited supply of bond financing. Market segmentation implies that local bias affects both the overall availability of debt financing and the inability of the firm to substitute bank financing with bond financing (“debt inflexibility”). A regional market with high debt inflexibility will make it harder or more costly for firms to replace bank debt with bond financing when needed. As this friction increases, firms will be less able to replace bank debt with bond debt and will be more affected by a contraction in monetary policy.

For example, let us consider a firm whose source of debt financing is located in a specific financial habitat – defined in terms of the potential bond-holders and bank lenders – in which it is possible to borrow from banks, but the ability to replace them with bonds is scarce—i.e., debt inflexibility is high. If the lending standards become tight – i.e., banks are not willing to lend – the firm will face constraints in substituting its bank loans with bond financing in the presence of high debt inflexibility. At the same time, during monetary contractions, it is also more difficult for the firm to replace local banks with non-local ones, as the latter are also constrained. The firm may then try to borrow outside of its local market. However, higher information asymmetry and steeper transaction costs would then make it expensive. In other words, segmentation makes it difficult for the firms located in these regions to get away from the “tyranny” of bank financing.

In the presence of such inflexibility, either the firm finds itself “rationed” in the debt market, or it faces a higher cost of debt financing. This increases the incentives for the firm to resort to equity financing. Given that taxes, transaction costs, information asymmetry between the firm and the market, and agency costs limit the firm's incentive to issue equity, debt inflexibility affects the firm's payout and investment policies in a way similar to what financial constraints would do. This implies that higher debt inflexibility induces firms to resort more to equity and less to debt and lowers leverage and makes the firm more financially constrained. This will represent our first hypothesis.

If debt inflexibility captures the firm's inability to replace bank loans with bonds, then its impact should be stronger during periods of tight monetary policy, when the incentive of the firm to substitute bank loans with bonds is high and the ability to replace local bank financing with non-local bank financing is limited.

The impact of debt inflexibility should be different for small and big firms. Indeed, smaller firms, being less able to borrow non-locally, would either issue more equity or scale down their investment. Therefore, credit tightening should mostly affect investment and external financing for relatively small firms and induce a reallocation between bond and bank financing for big firms. Also, the impact of debt inflexibility should depend on whether the firm has a prior banking relationship. Indeed, Bharath et al. (2007) show that the presence of a banking relationship increases credit availability. Hachem (2011) theorizes that relationship borrowers are less subject to monetary contractions.

Overall, debt inflexibility should propagate the transmission of monetary policy through the credit channel, especially for smaller firms and firms without banking relationships. This will be our second hypothesis. It suggests a new channel through which local market conditions affect the firm's corporate financial policies and provides a cross-sectional identification of their reactions to the stance of monetary policy.

We test these hypotheses on US corporations for the period 1991–2005. The “local debt market” is defined as the region in which the firm funds itself. It captures all the debt – both bonds and loans – funding that is potentially available to the firm within a 300-mile radius around the firm's headquarters. Credit availability is identified by using data on bond holdings of institutional investors, bank deposits and loans.

Preliminary evidence shows that the borrowing of the firm is tilted toward its local area. Both in the case of loans and in the case of bonds, the lenders tend to be located close by. The next question is therefore whether distant borrowing and its related higher cost are common among firms belonging to the same local debt market. The results show that firms tend to borrow at greater distances and pay higher borrowing costs, when they are located near firms (from different industries) that borrow from distant sources and pay a higher price in doing so.

This local behavior has implications for the cost of financing. If lenders prefer to lend locally, firms that finance themselves non-locally should face higher borrowing costs. And, indeed, as a firm borrows at a greater distance, the cost of borrowing increases. An increase in borrowing distance by one standard deviation is related to a 10% (17%) higher borrowing

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