



Do banks price discriminate spatially? Evidence from small business lending in local credit markets



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ABSTRACT

In this paper we explore the effects of bank–borrower physical proximity on price and non-price aspects of small business lending in local credit markets. Along the price dimension, our analysis reveals that interest rates increase with bank–borrower distance and decrease with the distance between borrower and other competing banks. Along the quantity dimension, we observe that more distant borrowers are more likely to experience binding credit limits. We also show that the quantity effects of bank–borrower distance are concentrated among less transparent firms. Our findings are consistent with pricing based on marginal costs that reflect information-based factors, and are in contrast to the established paradigm, where banks adopt spatial discriminatory pricing rules when lending to small-sized enterprises.

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1. Introduction

The last 30 years have witnessed a process of extraordinary advancement in information and communication technologies. This has led the banking industry to a widespread adoption of various mechanisms for impersonal service delivery (e.g., phone and internet banking, automated teller machine networks) and screening technologies (e.g., automated credit scoring models). Despite this technological transformation, the physical proximity between borrowers and their lending banks, and other banks in the local credit market remains a major factor for the price and non-price outcomes of the lending transaction (Alessandrini et al., 2009; Cerqueiro et al., 2009).

In general, the importance of geographic distance for the process of economic exchange is attributable to the presence of transaction costs, related to transportation of economic agents and products, and information frictions. Extant research in the banking field offers robust evidence on the existence and significance of

such costs (e.g., Petersen and Rajan, 2002; Brevoort and Wolken, 2009). By contrast, the exact nature of the costs of borrower–lender distance, i.e. whether they reflect information frictions, transportation factors, or both, and how these costs influence the pricing and supply of bank loans remain open questions. In this paper we address these two questions about the role and nature of the costs of distance in the context of small business lending. First, we establish how these costs are incorporated in the pricing of bank loans. Second, by examining the availability of credit and its degree of tightness, we infer whether the effect of distance is more likely to reflect transportation or information factors.

There are two main arguments why distance between the contracting parties is relevant for the cost of bank credit. First, physical proximity affects the transportation costs borrowers and loan officers face when they complete and manage transactions in person (Chiappori et al., 1995; Sussman and Zeira, 1995; Almazan, 2002). Second, information and search costs borrowers incur in order to learn about products and loan conditions offered by other banks in the local market decrease with the geographic closeness between the borrower and these banks (Gehrig, 1998). More importantly, the amount and precision of information available to the lending officer is directly related to the proximity between

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the officer and borrower's economic and social environment (Almazan, 2002; Dell'Ariccia and Marquez, 2004; Hauswald and Marquez, 2003, 2006). Besides, information asymmetry concerns such as "winner's curse" can also be related to the distance between borrower and bank's competitors (Shaffer, 1998). This affects the quality of information and the need for visiting borrowers frequently, which implies that presence of nearby competitors could increase the information and transportation costs for the lending bank.

Regardless of the precise nature and source of the costs of distance, their impact on loan interest rates depends on the underlying pricing model adopted by the lending bank. Specifically, the main distinction can be drawn based on whether banks price discriminate borrowers spatially by location or, alternatively, price loans according to marginal costs.

In case of spatial discriminatory pricing, banks exploit their monopoly power over nearby borrowers obtained from transportation and/or informational advantages. Banks can thus charge such borrowers higher interest rates (Lederer and Hurter, 1986; Dell'Ariccia et al., 1999; Degryse et al., 2009). The market-power effects of distance should also depend on the location of the other competing banks in the local credit market. When nearby alternative lending sources are available, the transportation and informational advantages of the lending bank, and thus the interest rate it may charge, are lower.

Different prediction arises when banks set interest rates following a simple rule of mark-up over marginal cost. Loan rates should be positively associated with borrower–lender distance if the marginal costs increase with this distance. By contrast, the distance between a borrower and competitors of the lending bank has an ambiguous effect on the interest rate. On the one hand, concerns about the possible realization of "winner's curse" are mitigated when a borrower is farther away from bank's competitors. This lowers the costs faced by the lending bank. On the other hand, the lending bank may increase the mark-up as switching banks is more costly for borrowers located farther away from other potential lenders (Barone et al., 2011).

Recently, a number of studies have examined empirically how loan rates and credit supply vary with the geographic proximity between borrower and lender. In their seminal paper on the changing importance of distance for small business lending, Petersen and Rajan (2002) show a significant increase in the average (but not median) distance between borrower and lender in the US context. They also find that firms that are able to borrow at distance pay lower interest rates and have higher chances of seeing their loan applications approved. The study captures ability to borrow at distance as the predicted value of a regression of observed distance from lenders on measures of public information about borrower. In this perspective, the findings of Petersen and Rajan (2002) suggest that the impact of distance on interest rates and credit availability reflects banks' proprietary information and borrowers' transparency, rather than spatial discriminatory pricing.

Agarwal and Hauswald (2010) analyze the lending decisions of a major US bank about loan applications by small corporate borrowers. The study shows that applicants close to the lending branch pay higher interest rates but are also more likely to obtain credit. Consistent with information-based theories, this pattern disappears once the analysis accounts for loan officers' proprietary information, measured by the component of borrowers' assigned credit scores orthogonal to public information about their credit quality. Since the authors consider the actual distance between applicant and bank branch, and control for distance to the nearest rival of the lending bank, their findings are supportive of information-based models of discriminatory pricing (Dell'Ariccia and Marquez, 2004; Hauswald and Marquez, 2006).

Degryse and Ongena (2005) study the pricing behavior of a large Belgian bank with respect to loans made almost exclusively to individual and small businesses and document that interest rates decrease (increase) with the distance between the borrower and lending bank (competing banks). The effects of distance appear to be mainly driven by transactional loans, and almost non-existent for loans that are more likely to be relationship-based, and thus more information-sensitive. The authors interpret their findings as consistent with models of spatial price discrimination and banks internalizing transportation costs for nearby borrowers. In a subsequent study analyzing loan contracts from the same bank, Degryse et al. (2009) provide further evidence in favor of spatial discriminatory pricing driven by transportation costs. In particular, they show that the association between borrower's distance to competing banks and loan interest rates decreases when the rival banks are hierarchically organized. To the extent that such banks are more likely to make lending decisions using hard information (Stein, 2002), the number and frequency of required in-person meetings between borrower and loan officer should decrease, thus lowering the market power of the lending bank.

In contrast to the above studies, Knyazeva and Knyazeva (2012) focus on syndicated loans to large firms and find that interest rates are positively associated with the geographic distance between the borrowing firm and its lead lender (or the average distance to the pool of lenders).¹ The authors advance the argument that this pattern reflects increasing costs of delegated monitoring banks have to incur when dealing with borrowers located farther away.

Overall, the available empirical evidence suggests an interesting dichotomy. Banks tend to follow spatial discriminatory pricing when lending to small- and mid-sized enterprises (SMEs). Such borrowers are usually more opaque from an informational point of view, require in-person contacts and interactions, and are typically restricted to access only the local credit market where they reside. By contrast, banks appear to price loans on the basis of marginal cost when lending to large corporations. Information, transportation and switching costs should be less important on the margin for these clients.

In this paper, we present findings that raise a question about the pricing paradigm that appears in the literature. Specifically, our analysis provides evidence consistent with marginal cost pricing for small business loans. We analyze a large proprietary dataset of loans granted by a major inter-regional Italian bank to SMEs in the period 2004–2006 and find that interest rates increase with the borrower–lender distance and decrease with the distance between borrower and competing banks in the local credit market. This suggests that physical distance from the lending branch represents a non-trivial cost in the lending relationship that banks transfer onto their borrowers.

The second step of our analysis investigates the quantity dimension of the bank–borrower interaction, captured through the probability that a borrower faces tight credit availability and has to use the costly option to overdraw funds over the granted credit line. The quantity perspective allows us to offer some insight into the economic factors – transportation or information – that underlie the costs of distance. Our identification strategy rests on the following idea. If distance reflects pure transportation costs, the credit constraints faced by borrowers, and thus likelihood of overdrawing, should not be affected by their location as these costs can be more easily quantified and reflected in the price-setting process, making credit supply and demand roughly aligned. Conversely, if bank–borrower distance is a proxy for information asymmetry and its costs, banks should be more restrictive in

¹ Similarly, Giannetti and Yafeh (2012) document that the interest rates on large international syndicated loans are positively associated with the cultural distance between borrower and lead lender.

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