ABSTRACT. Reliable information on small- and medium-sized enterprises (SMEs) is rare and costly for financial intermediaries. Therefore relationship banking is often considered as the appropriate lending technique. In this paper we offer a theoretical model to analyze relationship banking and the pricing behavior of banks in a Bertrand competition framework with monitoring costs. We show that the lack of reliable information leads to comparable high interest rates even if a long-term relationship between borrower and bank exists. The paper offers a theoretical explanation why SMEs often are faced with borrowing constraints.

KEYWORDS: accounting, financial constraints, relationship banking, small and medium sized enterprises

JEL CLASSIFICATION: D43, D82, G21, M41

1. Introduction

Typically in industrialized countries, small- and medium-sized enterprises (SMEs) account for more than 90% of all firms, they employ about two-thirds of the workforce, and contribute to nearly 50% of the value added in non-agricultural production. They are often considered to play an important role in growth promotion and poverty reduction (World Bank, 1994, 2002, 2004; Beck et al., 2003; Wagenvoort, 2003). Nevertheless, it seems to be a global phenomenon that SMEs are confronted with relatively harsh credit constraints (Beck and Maksimovic, 2002; European Commission, 2002; Beck et al., 2003).

Until now the analytical framework concerning price-setting behavior of banks and information availability on SMEs has been underdeveloped. Since reliable information on SMEs is rare and costly, relationship lending is often considered as the most appropriate lending technique for collecting information on SMEs (Boot and Milbourn, 2002); the firm and the bank enter in a long-term relationship that assures the firm’s access to credit and gives the bank access to information about the firm (Allen et al., 1991; Nakamura, 1992; Berger et al., 1999; Boot, 2000). One important characteristic of such a relation is the increase of the value of the information (Schaeffer, 2003). Therefore, one could expect that loan interest rates should decline over time. However, recent empirical and theoretical literature on relationship banking offers ambiguous results: Peterson and Rajan (1994) suggest that loan interest rates decline with relationship lending. The opposite effect is described by Greenbaum et al. (1989) and Sharpe (1990); they demonstrate conditions under which lenders subsidize borrowers in early periods and are reimbursed in later periods.

Based on so-called “soft” information, this lending technique is mainly generated by the bank’s past experience with a given lender. Here, we take a closer look at this problem and develop a theoretical model to analyze the effects of the lending technique on the interest rate. Previous studies, where perfect competition is impeded by asymmetric information, show that professional financial intermediaries like banks can benefit from economies of scale in
obtaining information about borrowers (Stiglitz and Weiss, 1981; Diamond, 1984; Diamond and Verrecchia, 1991; Ramakrishnan and Thakor, 1984; Boyd and Prescott, 1986). The main difference between our article and these previous studies is that we focus on profit maximization of banks and take into account the specific lending technique used by banks.

We show that the choice of the lending technique is crucial for the cost function of the bank. These costs occur from the costs of monitoring borrowers, the costs of refinancing credits and the costs of lending to borrowers who cannot pay back their credit (bad loans). The lending technique affects two components of the costs of a bank. First, the lending technique determines the monitoring cost curve. Second, it affects the efficiency of monitoring and therefore the share of bad loans in the portfolio of banks.

We argue on the basis of a Bertrand competition framework – frequently used in the credit market literature (Dell’Ariccia et al., 1999; Jun and Vives, 2004). An important advantage of this type of competition is that polypoly effects are generated in the duopoly case. Therefore differences in lending techniques are not superposed by duopoly – effects, i.e. by strategic interactions between banks or firms. The lack of borrower market power is a key assumption of Bertrand competition (Gal-or, 1986; Bracoud, 2002). We show that there exist linkages between the chosen lending technique and the loan interest rate. The major finding of our paper is that with a longer duration of the lending relationship, loan interest rates are not reduced. Furthermore, we show that in markets where banks rely on relationship lending, borrowers are charged higher interest rates compared to markets where relationship lending and credit scoring/financial statement lending coexist.

The remainder of the paper is organized as follows: in Section 2 we develop a model of banking with different lending techniques. In Section 3 we discuss the results of the model, while Section 4 offers conclusions.

2. The model

Financial intermediaries need information on potential borrowers. Only on the base of sufficient information they can make an efficient decision whether to finance a given investment project or not. Nevertheless, reliable information on firms is not always publicly available. Especially SMEs usually are not forced to use sophisticated accounting techniques and to publish their balance sheets. Therefore information on these enterprises is relatively costly. In such a case a financial intermediary might try to use relationship banking to collect information on the potential borrower over time.

In general, a bank has the possibility to monitor borrowers and to gain information on potential investment projects. Monitoring causes costs (t). The incentive for banks to monitor arises from the assumption of prohibitive costs in the case of non-monitoring. If a bank chooses the relationship lending technique monitoring costs are a function of the maturity of the bank–borrower relation. In the case of financial statement lending they are constant and do not vary with the duration of the bank–borrower relationship (Table I). Consequently, if banks differ with respect to the lending technique, they will have different (monitoring) cost curves (Box 2). But does relationship lending lead to lower interest rates for borrowers with long-term relationships?

2.1. The general structure of the model

We assume a number (A) of borrowers. Each of them wants to realize a single investment project that requires one unit of funding and generates a random return. These borrowers are atomic and therefore have no market power. Market demand for finance is generated by a continuum of investors represented by the atomic probability space (A, A, ν). Let the demand function \(d : R^+ \times A \rightarrow R\) be such that the integral \(D(p) = \int_A d(r, a) d\nu(a)\) is well defined for every \(r \in R^+\). For any borrower \(a \in A\), \(d(r, a)\) specifies his or her demand if he or she can borrow at any given (positive) interest rate \(r\). The total market demand function \(D(-)\) indicates the aggregate amount of credit that all investors together are willing to take at a given (positive) interest rate (e.g. Allen and Hellwig, 1993).

The firms can have either good or bad investment opportunities, so that there is a share