



## Credit market structure and bank screening An indirect test on Italian data

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### ARTICLE INFO

#### Article history:

Received 22 April 2009

Received in revised form 22 January 2010

Accepted 14 May 2010

Available online 15 June 2010

#### JEL classification:

D40

G21

#### Keywords:

Credit market structure

Small and medium sized firms

Bank debt

Firm riskiness

### ABSTRACT

Based on a large panel of Italian SMEs, this paper focuses on the relationship between firms' default probability and the amount of bank debt they obtain, evaluating whether and to what extent this link is affected by the degree of competition characterizing the local credit market where firms operate. Using a dynamic panel estimator, we find that higher bank competition implies a stronger influence of firms' riskiness on bank financing to SMEs. We provide two plausible interpretations of this finding: one resorting to more accurate screening by more competitive banks; the other alleging lower market power of incumbent banks, which may restrict their willingness to finance riskier firms.

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### 1. Introduction

In the last decade an intense dispute in the economic literature has been centered on the question “is competition among banks good or bad?”. As *Cetorelli (2001)* claims, the need for such a debate would be unjustified if banks' role were simply to intermediate between supply and demand of credit. In that case, in fact, there would not be reasons to treat banks differently from other firms or to doubt that market power in credit markets is likely to lead to welfare losses, as asserted by the common wisdom. However banks perform other crucial functions in an economy, such as the screening of investment projects and, through this, the allocation of capital resources to the best social uses. Understanding how credit market structure may affect these additional banks' functions represents the meaning and focus of the banking competition debate.

So far, studies on this topic have reached controversial results – on both theoretical and empirical grounds – thus calling for further research. This paper aspires to contribute to the empirical literature on banking competition by indirectly investigating the impact of credit market structure on banks' screening activity. More precisely,

we focus on the relationship between default probability and bank debt at firm level and question if and to what extent this link is influenced by the degree of banking competition characterizing the local credit market in which firms operate. Our hypothesis may be stated as follows: if competition in credit markets affects banks' probability to screen – as shown, both theoretically and empirically, by several contributions in the literature on bank market structure, briefly reviewed in the next section – then it is reasonable to suppose that firms' riskiness (which is the core of bank screening) should have, *ceteris paribus*, a different effect both on the cost and quantity of credit to entrepreneurs, depending on the degree of bank competition. Since we lack information on loan interest rates at firm level, our hypothesis is investigated considering the relationship going from firms' default probability to their bank debt. We do not posit any *a priori* expectation on the sign of this relationship (thus leaving it to be an empirical finding) – since the theoretical implications of firms' characteristics, such as default risk, on lending volumes are not univocal (i.e. *Stiglitz & Weiss, 1981 versus de Meza & Webb, 1987*; for a wide discussion on this debate see *Cressy, 2002*).

To carry out the empirical analysis, we focus on Italian small and medium sized manufacturing firms (henceforth SMEs), which have little access to capital markets (either public equity or bond market) and are bound to ask credit from banks with branches in the same local market where they operate. Indeed, as *Cesarini (2003)* highlights, once internal funds are depleted, the banking channel is often

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the only way for Italian SMEs – usually facing high costs in employing arm's length finance (bond and Stock Exchange markets finance) – to gain access to external funds.

Consistently with other contributions on the Italian banking system, we define 103 local markets corresponding to the existing administrative provinces. This disaggregation enables us to take advantage of an important feature of the Italian case. Indeed, Italian provinces are characterized by diversity in banking structures and this provides sufficient cross-sectional variability within a single institutional framework. Given this regulatory uniformity, there is no need to control for different regimes (Bonaccorsi di Patti & Dell'Ariccia, 2004).

To measure banking competition in local credit markets, we employ the Herfindahl–Hirschman Index (HHI) on deposits which “represents a good proxy for competition in loan markets if the empirical investigation involves firms that largely borrow from local markets, that is if credit markets are local for the firms under consideration” (Petersen & Rajan, 1995 p. 418). As claimed above, this is the case for our sample units.

The indicators of firms' default probability used in this paper have been computed by Moody's KMV on our sample data, via *RiskCalc* model. As argued by Moody's KMV, this model enables high precision and accuracy in evaluating private firm credit risk by using financial statements and, for listed firms, equity market-based information. The *RiskCalc* model is adopted by leading Italian banks as a benchmark for their internal credit risk estimates. In the empirical investigation we employ the cumulative EDF (Expected Default Frequency) measures – which are actual firms' default probabilities – within one, three and five years.

The econometric analysis, implemented on a large set of micro-data running up to 2003 from 1995, is carried out by employing the dynamic panel estimator of Arellano, and Bover (1995) and Blundell, and Bond (1998), which allows to take into account the role of firm-specific effects (unobserved heterogeneity), as well as the “endogeneity” of a number of bank debt determinants.

Our results seem to indicate that higher competition in local credit markets implies a stronger influence of firms' riskiness on the amount of bank debt granted to small and medium entrepreneurship (as well as on their bank debt growth). So that, since the relationship between firms' riskiness and bank debt is found negative, *ceteris paribus*, bank financing tends to be lower for riskier SMEs running in more competitive credit markets. In our view, a plausible interpretation of this evidence is that – as argued also by other contributions (i.e. Benfratello, Schiantarelli, & Sembenelli, 2006) – competitive pressures might force banks to perform more accurate screening, thus raising their efficiency in funds allocation. However, bank financing to riskier firms could be lower in more competitive credit markets for a reason unrelated to bank screening: higher bank competition may reduce the market power of incumbent banks, hence lowering their willingness to finance riskier firms – an explanation in line with the findings of Petersen, and Rajan (1995). As we argue below (see Section 5), both these interpretations may be considered likewise plausible, as well as not conflicting with each other, since the conceptual mechanisms they subtend may jointly represent the source of our evidence.

The remainder of the paper is organized as follows. The next section presents a brief review of the literature on the economic effects of banking competition. Section 3 illustrates the econometric specification and the methodology adopted. Section 4 describes the data. Section 5 reports the results obtained and the robustness checks performed. Finally, Section 6 summarizes and concludes.

## 2. A brief literature review

In a decade or so of debate on banking competition a considerable body of research has been proposed. Given the scope of our work, in what follows we focus briefly only on the most relevant contributions that

have analyzed – both theoretically and empirically – the effects of banking competition on banks' screening activity or, more generally, the role of banking market structure on funds allocation in the economy.<sup>1</sup>

In a model of bank screening, Shaffer (1998) shows that the average creditworthiness of a bank's pool of borrowers declines as banking competition increases. In a similar model, Cao and Shi (2001) prove that a more intense banking competition can reduce banks' screening incentives, so that the number of banks actively performing screening and competing in credit supply falls. As a result, in a market with many banks, loan rates would be higher and credit volumes lower than in a market with a few banks. In line with this study, Dell'Ariccia (2000) concludes that more banking competition reduces the likelihood that banks will screen entrepreneurs, as opposed to indiscriminate lending.

Using a dynamic model of capital accumulation, Cetorelli (1997) points out that a monopolistic credit market brings about a trade-off between efficient allocation of funds and quantity of credit made available. A monopolist bank can efficiently screen potential borrowers, thus increasing the quality of credit supply. On the other hand, the rent-extraction behavior of the monopolist bank produces a negative effect on equilibrium credit quantities. Cetorelli and Peretto (2000) identify the same trade-off in a Cournot oligopoly model.

Chiesa (1998) claims that when banks engage in information production about firms, a concentrated banking industry leads credit allocation to be closer to the first-best optimum. Similarly, Gehrig (1998) shows that – when banks use screening procedures that generate (imperfect) information on borrowers – an increased competition reduces screening efforts, so that the quality of the overall loan portfolio declines. Also Marquez (2002), Gehrig and Stenbacka (2001), and Hauswald, and Marquez (2006) argue that competition reduces banks' screening ability by worsening the pool of loan applicants. Manove, Padilla, and Pagano (2001) show that, in a competitive environment, the use of collateral in debt contracts may lead banks' screening effort below its socially efficient level.

De Mello (2004) analyzes a model in which the impact of bank market power on credit supply depends on how much information about borrowers is available. He provides evidence that, by increasing the rent extraction associated with acquiring private information on firms, market power induces more investment in private information acquisition, so as to recruit good borrowers. Boot, and Thakor (2000) develop a banking model to study the nature of lending relationships and how these depend on competition, finding that increased bank competition improves welfare for intermediate and high quality borrowers, whereas low-quality borrowers may be either better or worse off.

Beside these studies, other works reach different conclusions. Jayaratne and Strahan (1996, 1998) find, among other things, that banks improved their screening and monitoring of borrowers after the U.S. branching deregulation. Since this latter has enhanced banking competition,<sup>2</sup> their results suggest indirect beneficial effects of banking competition on banks' screening activity. By using both bank level balance sheet data and macroeconomic data for the EU-15 countries, Chen (2007) finds that, after the implementation of the Second European Banking Directive, increased banking competition has improved loans' quality. Focusing on the French case, Bertrand, Schoar, and Thesmar (2007) document that, following the deregulation process started in 1985 – which promoted, among other things, a more vigorous banking competition – banks improved their monitoring and/or screening functions. Chen (2005) claims that, when facing competitive pressures, it is more likely that banks choose screening activity instead

<sup>1</sup> As a consequence, we do not discuss the many studies analyzing the role of banking competition on credit availability to firms or on some other economic aspect, such as capital accumulation, growth etc. For an extensive review of these contributions see Cetorelli (2001). For more general reviews on the issue of banking competition see Berger, Demsetz, and Strahan (1999), Carletti, Hartmann, and Spagnolo (2002), Northcott (2004), Degryse, and Ongena (2008).

<sup>2</sup> On the beneficial dynamic effects of banking competition following deregulation in the U.S. see also Strahan (2003). For the Italian case, see Angelini and Cetorelli (2003).

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