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How does competition affect bank risk-taking?

Gabriel Jiménez [a], Jose A. Lopez [b,*], Jesús Saurina [a]

[a] Banco de España, Spain
[b] Federal Reserve Bank of San Francisco, United States

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ABSTRACT

A common assumption in the academic literature and in the supervision of banking systems is that franchise value plays a key role in limiting bank risk-taking. As market power is the primary source of franchise value, reduced competition in banking markets has been seen as promoting banking stability. A recent paper by Martínez-Miera and Repullo (MMR, 2010) shows that a nonlinear relationship theoretically exists between bank competition and risk-taking in the loan market. We test this hypothesis using data from the Spanish banking system. After controlling for macroeconomic conditions and bank characteristics, we find support for this nonlinear relationship using standard measures of market concentration in both the loan and deposit markets. When direct measures of market power, such as Lerner indices, are used, the empirical results are more supportive of the original franchise value hypothesis, but only in the loan market. Overall, the results highlight the empirical relevance of the MMR model, even though further analysis across other banking markets is needed.

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1. Introduction

A standard principle of banking supervision is that increased competition among banks could threaten the solvency of particular institutions and hamper the stability of the banking system at an aggregate level. Such competition could erode the franchise value of a bank and encourage it to pursue riskier policies in an attempt to maintain its former profits.[1] Examples of riskier policies are taking on more credit risk in the loan portfolio, lowering capital levels, or both. These riskier policies should increase the probability of higher non-performing loan ratios and lead to more bank failures. In contrast, restrained competition should encourage banks to protect their higher franchise values by pursuing safer policies that contribute to the stability of the entire banking system. This "franchise value" paradigm has been supported both theoretically and empirically over time in the banking literature.

A debate regarding this paradigm was initiated by the work of Boyd and De Nicoló (BDN, 2005). In their model, less competition among banks could result in higher interest rates being charged on business loans, which might raise the credit risk of borrowers as a result of moral hazard issues, as in Stiglitz and Weiss (1981). The increased default risk could lead to more problem loans and greater bank instability. The authors argue that this "loan market channel" could eliminate the trade-off between competition and financial stability implied by the "deposit channel" implied by the franchise value paradigm; that is, the economic rents that banks earn from depositors provide the only incentives to carry out conservative asset side policies. Their proposed "risk-shifting" paradigm argues that increased competition across both the loan and deposit markets could lower loan rates, decrease borrower credit risk, and enhance financial stability. In fact, Boyd et al. (2006) as well as De Nicoló and Loukoianova (2007) provide empirical evidence of a positive relationship between banking market concentration and bank risk-taking.

More recently, Martínez-Miera and Repullo (MMR, 2010) extend the BDN model by allowing for imperfect correlation across individual firms' default probabilities. Their model also identifies a risk-shifting effect that accounts for fewer firm defaults when loan rates decrease in a more competitive banking environment. However, since imperfect correlation between firms is now permitted, there is also a "margin" effect that reduces the interest

* Corresponding author. Tel.: +1 415 977 3894.
E-mail addresses: gabriel.jimenez@bde.es (G. Jiménez), jose.a.lopez@sf.frb.org (J.A. Lopez), jsaurina@bde.es (J. Saurina).

[1] The extensive theoretical literature on this topic was started by Keeley (1990) and is summarized in Section 2 of this paper. Carletti and Hartmann (2003) as well as Carletti (2008) survey the literature on financial stability and competition.

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payments from performing loans and thus bank revenues. These two effects work in opposite directions, so that the net effect on bank risk-taking and financial stability is unclear. In their model, the risk-shifting effect is shown to be dominated by the margin effect in competitive banking environments, such that increased competition increases bank failure risk. In a more concentrated banking market, the model suggests that the risk-shifting effect dominates and thus bank failure risk declines with increased competition. Overall, the authors show that there is a U-shaped relationship in their model between bank competition, which is measured by the number of banks, and the risk of bank failure.

The objective of this paper is to examine empirically whether the relationship between bank competition and risk-taking is linear, as suggested by both the franchise value and risk-shifting models (although with opposite signs), or U-shaped as in the MMR model. We examine this relationship within the context of the Spanish banking system. While some papers have used cross-country data to examine this relationship, we focus on a single banking system to ensure comparability across both dependent and independent variables. Our analysis of the Spanish banking system permits us to use detailed databases to construct consistent market concentration variables, such as Herfindahl–Hirschmann indexes and the number of banks operating in a market. We also generate Lerner indexes as alternative measures of market power using the Banco de España's interest rate database that contains monthly information about the marginal interest rates charged by each bank for several banking products, such as commercial loans and deposits. Similarly, for our independent variable measure of bank risk, we use the Banco de España's credit register to obtain consistent estimates of banks' commercial non-performing loan ratios (NPL), which are an empirical measure of bank risk.

Our empirical results for the Spanish banking market provide support for the relationships proposed in the MMR model. That is, after controlling for macroeconomic conditions and bank characteristics, we find evidence of a nonlinear relationship between banking market competition and bank risk-taking using standard market concentration measures for both loan and deposit markets. When Lerner indices are used as measures of bank competition, the results do not suggest a nonlinear relationship, but do support the franchise value paradigm directly in the loan market. This result may be due to the fact that the MMR model is not framed with respect to such concentration variables. Importantly, while the empirical relationship between banking market concentration in the Spanish deposit market and bank risk-taking with respect to non-performing loans was found to be nonlinear, the coefficients suggest that the relationship is concave as opposed to the convex relationship found in the loan market, both in theory and in our data. Further analysis of this deposit market result is necessary.

In summary, we find supportive evidence of a nonlinear relationship between bank market concentration and bank risk-taking, although the relationship does not hold across all banking markets and concentration variables. The paper is organized as follows. Section 2 contains a brief discussion of the theoretical and empirical literature on the topic. In Section 3, we present our databases, variables and methodology used to empirically examine the trade-off between competition and bank risk. Section 4 presents our empirical results, and Section 5 concludes.

2. Literature review

2.1. Theoretical literature

The "franchise value" paradigm for bank risk-taking, both with and without government regulation, is well established in the banking literature. Simply stated, the idea is that banks limit their risk-taking in order to protect the quasi-monopoly rents granted by their government charters. Increased competition would erode these rents and the value of the charters, which would likely lead to greater bank risk-taking and greater financial instability.

One of the earliest papers in this literature was by Marcus (1984), who used a one-period model to show that franchise value declines as a bank engages in riskier policies. Chan et al. (1986) showed that increased competition erodes the surplus that banks can earn by identifying high-quality borrowers. The reduction in value leads banks to reduce their screening of potential borrowers and, thus, overall portfolio credit quality declines. Keeley (1990), following Furlong and Keeley (1989), used a state preference model with two periods to show explicitly that a decline in franchise value increases bank risk-taking. Besanko and Thakor (1993) showed that increased competition erodes informational rents originated from relationship banking and leads to greater risk-taking by banks. In a context of asymmetric information, Marquez (2002) showed that an increase in the number of banks in a market disperses the borrower-specific information and results in both higher funding costs and greater access to credit for low-quality borrowers.

Using a dynamic optimization model with an infinite horizon, Suárez (1994) showed a trade-off between market power and solvency. If the market power of the bank decreases, the incentive to engage in riskier policies increases significantly. As the franchise value of the bank is a component of bankruptcy costs, it should encourage the bank to carry out prudent policies that increase the solvency of the bank.[2] Matutes and Vives (1996, 2000) showed in a framework of imperfect competition (i.e., product differentiation) that higher market power reduces a bank's default probability. Hellmann et al. (2000) showed in a dynamic model of moral hazard that competition can have a negative impact on prudent bank behavior. Capital requirements are not sufficient to reduce the gambling incentives in the system, and deposit rate controls need to be added as an additional regulatory instrument. Building on that, Repullo (2004) used a dynamic model of imperfect banking competition to show that more competition (i.e., lower bank margins) leads to more risk-taking in the absence of regulation, risk-based capital requirements were found to effectively control the risk-shifting incentives in that model.

As an interesting alternative to the franchise value paradigm, Boyd and De Nicoló (BDN, 2005) developed a model, modifying one presented by Allen and Gale (2000), where an increase in bank market power both in the loan and deposit markets translates into higher loan rates charged to borrowers. In a moral hazard environment as per Stiglitz and Weiss (1981), entrepreneurs facing higher interest rates on their loans would choose to increase the risk of their investment projects, a practice that would lead to more problem loans and a higher bankruptcy risk for banks. They find a monotonic declining relationship between competition (measured as the number of banks lending in a market) and bank risk; that is, as the number of banks and competition increases, the level of bank risk would decline.

Martínez-Miera and Repullo (MMR, 2010) extend the BDN model by introducing imperfect correlation across borrowing firms. Under this assumption, two potentially countervailing effects of bank competition are introduced. As in the BDN model, the "risk-shifting" effect captures the result that more competition leads to lower loan rates, lower firm default probabilities, and improved bank risk measures. However, the lower rates should also reduce all firms' interest payments and thus overall bank revenues,

[2] Chan et al. (1986) also consider the franchise value a component of the private cost of bankruptcy.