



The effects of the structure of banking market and funding strategy on risk and return



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ABSTRACT

This paper analyses the implications of bank market power and funding structure for risk and return. It employs a sample of 978 banks in 55 countries leading up to the 2008 financial crisis to test for two related hypotheses. First, competition reduces internal capital as the level of market power increases when banks use internal funding to diversify into non-interest income generating activities. Building on these results and employing various specifications of Lerner index and funding strategy, the second test suggests that the relatively low insolvency risk among banks in emerging and developing countries during 2000–2007 is attributed to the high degree of market power and the use of internally generated funds.

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1. Introduction

The 2007 financial crisis has important implications for the feasibility of different types of banking models. On funding strategy, literature has mixed results of the effect of the non-deposit funding on bank risk and return. Earlier studies provide the positive effect of wholesale funding including exploiting valuable investment opportunities without being constrained by the local deposit supply; the ability of wholesale financiers to provide market discipline Calomiris (1999) and to refinance unexpected retail withdrawals (Goodfriend & King, 1998). However, the recent financial crisis has clearly shown the negative consequences associated with banks' reliance on non-deposit funding (Acharya, Gale, & Yorulmazer, 2011; Demircug-Kunt & Huizinga, 2010; Huang & Ratnovski, 2010). With the banking market, important changes have been made in the structure and the functioning of the financial systems during the past two decades.¹ These changes have affected banking concentration as well as the intensity of competition. Theoretical and empirical analysis of competition and banking sector soundness find their relationship to be ambiguous. Competition has long been analysed to reduce stability by exacerbating risk and reducing banks incentives to behave prudently (Hellman, Kevin Murdoch, & Stiglitz, 2000;

Keeley, 1990; Matutes & Vives, 2000). However, this argument has been countered by the competition especially in the loan markets reduce the risk of banks portfolios (Beck, Demircug-Kunt, & Levine, 2006; Boyd & De Nicolo, 2005; Boyd, De Nicolo, & Jalal, 2009).

This paper empirically analyses the interaction among banking market structure, funding modes and insolvency risk and return by employing a dataset that covers many regions of the world. In particular, it examines two related hypotheses. First, competition reduces deposit and internal capital financing. Second, the increasing non-deposit funding and declining internally generated funds increase risk and reduce banks profits. Although no previous study has tested both hypotheses, several papers have examined the second one contributing to the understanding of banks return and risk taking (Demircug-Kunt & Huizinga, 2010; Poghosyan & Cihak, 2009; Ratnovski & Huang, 2009). This paper is conducted in the context of developing countries where the capital market is relatively undeveloped and the banks are the main financiers of economic activities. Furthermore, conducting this study in the developing economies is very important as changes in the financial system of developing countries coupled with the changes in the prudential regulation have increased the effect of the perception, pricing and the risk management behaviour of banks (Borio & Zhu, 2008).

The contribution of this paper is two fold: first, it examines the determinants of market power and the variation of funding structure of banks in developing countries. From an economic policy perspective, it is important to identify the various sources of market power and the variation of funding strategies so that action can be taken to

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¹ The changes included domestic consolidation and regulatory reforms as well as lifting of restriction on foreign entry and operation (Barth et al., 2004).

reduce the economic shocks associated with the existence of market power and funding structure. Second, this paper is the first to analyse how bank market power and funding patterns perform in terms of producing profitable and stable banks in emerging markets. Here, instead of documenting trends and the relative importance of funding strategies, it takes the determinants of market power and the funding structure as examined in the first objective and investigates their relationship as well as the sensitivity of market power and funding modes on return on assets and insolvency risk at the individual bank level.

The Lerner index is used as a measure of market power. To avoid any bias emanating from a bank exercising market power in the deposits market, and given that there is no consensus in the literature regarding how best to assess the degree of bank market power (Carbó, Humphrey, Maudos, & Molyneux, 2009), this paper employs three different specifications of Lerner: a conventional Lerner (Berger, Klapper, & Turk-Ariss, 2009), a funding-adjusted Lerner (Maudos & De Guevara, 2007), and an efficiency-adjusted Lerner (Koetter, Kolari, & Spierdijk, 2008) to investigate the impact of market power on banks insolvency risk and return. Three funding modes have been identified in the sample: deposit funding, non-deposit/wholesale funding and internal capital funding.

The results demonstrate that on the average the funding and efficiency adjusted Lerner index are larger than that of the conventional Lerner index suggesting that the latter has been underestimating the degree of market power. The results reveal that the level of market power increases when banks in developing countries use their internal funds to diversify into non-interest income generating activities. Moreover, high return on assets of banks in emerging and developing countries can be attributed to the high degree of market power, high level of capitalisation, low level credit risk and internal bank capital. Again, the result shows that banks that rely on internal capital and deposit funding are safer than those that finance their assets with wholesale funds.

The rest of the paper is organised as follows: Section (2) reviews existing literature, Section (3) constructs various specifications of the Lerner index, a proxy for the degree of market power, the three funding modes, other control variables and estimation methodology. Section (4) contains the empirical results and Section (5) concludes.

2. Literature review

The existing empirical literature on the relationship between the structure of banking markets and risk and return has revealed ambiguous results. De Nicolo, Bartholomew, Zaman, and Zephirim (2004) reveal that a higher level of systemic risk is positively associated with a concentrated banking system. Similarly, De Nicolo and Loukoianova (2006) find a positive and significant relationship between bank concentration and bank risk of failure. They argue that, the coefficient is stronger when bank ownership is controlled and strongest when state-owned banks have sizeable market shares. Uhde and Heimeshoff (2009) use a dataset of 25 countries within the EU and find a negative relationship between bank concentration and financial soundness. In contrast, Beck et al. (2006) provide empirical evidence that suggests that increased banking concentration does not result in higher banking system fragility. Schaeck and Cihak (in press) and Schaeck, Cihak, and Wolfe (2009) find evidence for the trade off between competition and banks' risk-taking behaviour. Their study reveals that banks hold higher capital buffers when operating in a more competitive environment and that competitive banking system are less prone to experience systemic crisis. Berger et al. (2009) find support for the 'two views'. On the competition-stability, their study reveals that banks with a higher degree of market power bear significantly more loan portfolio risk. For the competition-fragility view, their findings suggest that banks with more market power have less overall risk exposure. Boyd et al. (2009) find that banks' probability of failure is positively and significantly related to concentration.

Literature on how funding structure affect banks' return and risk has also produced mixed results. Demircug-Kunt and Huizinga (2010) find that a fall in deposits lowers bank net-interest margin as a decline in customers' deposits is offset with an increase in wholesale funding. This is because a change in the funding structure given a particular asset mix will result in higher interest expense. Norden and Weber (2010) investigate the funding modes of banks and reveal that a decline in deposits and its substitution with wholesale funding unfavourably affects bank profit. Some of the prior literature on funding structure and banks' risk has centred on the ability of resource providers to monitor the activities of banks. Diamond (1984) established that, banks need to be partially equity-financed in order to provide customers with appropriate incentive to monitor projects they financed. In contrast, Calomiris (1999) shows that subordinated debts can perform the functions of monitoring a bank if it cannot avail itself of deposit insurance. Thus non-deposit funding in bank funding structure can reduce bank fragility through better monitoring. Though both deposit and non-deposit funding improve bank insolvency risk through monitoring, studies suggest that both tend to carry different risks in causing potential liquidity crisis and are also different in terms of speed and the size of charges in funding cost. On potential liquidity crisis on wholesale funding, Huang and Ratnovski (2010) contend that wholesale financiers may have an incentive to withdraw funding because of cheap and noisy signals of bank solvency, thus causing solvent banks to fail. Rajan (1992) finds that wholesale financing may duly foreclose on a firm that has a project with negative present value, but higher interest rate is levied if the project is to continue. Demircug-Kunt and Huizinga (2010) reveal that banking strategies that rely mostly on attracting non-deposit funding negatively affect banks' risk. Poghosyan and Cihak (2009) on their part find that non-deposit funding can distinguish sound banks from vulnerable banks. Ratnovski and Huang (2009), resolve that deposit funding was the key factor behind the relative resilience of Canadian banks during the 2007 financial crisis.

3. Methodology and data

3.1. Various specification of the Lerner index

Three different specifications of the Lerner index: a conventional Lerner (Berger et al., 2009) a funding-adjusted Lerner index (Maudos & De Guevara, 2007) and an efficiency-adjusted Lerner (Koetter et al., 2008) are employed to measure the degree of market power and to analyse its implication for bank risk and return. The index is a type of new empirical industrial organisation literature and provides a direct measure of degree of market power as it represents the mark-up of price over marginal cost. The index is the only measure of competition according to Berger et al. (2009), calculated at the bank level as:

$$Lerner_{it} = (Price_{it} - MC_{it}) / Price_{it} \quad (1)$$

where $Price_{it}$ is the price of the total assets. MC_{it} is the marginal cost of producing an additional unit of output. The MC_{it} is derived from the translog cost function as:

$$\begin{aligned} \ln Cost_{it} = & \beta_0 + \beta_1 \ln Q_{it} + \frac{\beta_2}{2} \ln Q_{it}^2 + \sum_{k=1}^3 \gamma_{kt} \ln W_{k,it} + \sum_{k=1}^3 \phi_k \ln Q_{it} \ln W_{k,it} \\ & + \sum_{k=1}^3 \sum_{j=1}^3 \delta_{ij} \ln W_{k,it} \ln W_{j,it} + \sum_{i=1}^3 (\delta_i/2) \ln W_{t,ij}^2 + \sum_{k=1}^2 \eta_k trend^k \quad (2) \\ & \sum_{i=1}^3 \varsigma_i \ln W_{t,ij} trend + v \ln Q_{it} trend + \varepsilon_j \end{aligned}$$

where $Cost_{it}$ is the bank's total costs including financial and operating cost; Q_{it} represents a proxy for bank output measured as total assets,

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