Economic Modelling 63 (2017) 46–59

Contents lists available at ScienceDirect

Economic Modelling

journal homepage: www.elsevier.com/locate/econmod

Market power and risk of Central and Eastern European banks: Does more powerful mean safer?

Ion Lapteacru

Larefi, Department of Economics, University of Bordeaux, Avenue Léon Duguit, 33608 Pessac, France

ARTICLE INFO

JEL classification:
G21
G28
D4
P34

Keywords:
Banking
Market power
Concentration
Risk
Central and Eastern Europe

ABSTRACT

As understanding the market power–risk relationship in CEE banking systems is of the utmost importance to policy-makers in these countries, we investigate whether CEE banks must have greater market power to be safer. Our results suggest that more market power reduces the fragility of banking institutions, on one hand, and that banking market concentration tends to make these banks riskier, on the other. Our findings are robust to whatever form of market power-risk relationship and whatever market-power measures we use. More precisely, financial markets perceive CEE banks with more market power as less fragile, while the latter are also better capitalised with respect to the distribution of their returns. Moreover, they are even (much) better capitalised when they hold less-diversified and less-liquid assets and when they operate within a stricter banking regulatory environment, which suggests a risk-stabilising role for diversification, liquidity and the bank regulatory environment in these countries.

1. Introduction

The banking systems of Central and Eastern European (CEE) countries have undergone many important changes during the transition period, particularly during its early stages. The lax market entry requirements led to the establishment of many new domestic private banks that were owned by new entrepreneurs, most with no prior banking experience (Bonin et al., 2015). The opening of these banking markets during the early stages of the transition enhanced competition in the banking market (Gelos and Roldós, 2002; Bonin et al., 2015), but the entry of these 'ephemeral' domestic banks caused a strong increase in risk of CEE banks. Meanwhile, the market power of CEE banks in general did not decrease (Lapteacru, 2014), which was likely because the banking crises of the 1990s encouraged these banking institutions to raise the prices of their products and services to levels that exceeded their marginal costs, to establish financial buffers against different types of financial shocks, to collect more private information about their customers and thus to reduce their risk.

In this paper, we seek to determine whether CEE banks must be more powerful and have more market power to be safer, *i.e.,* whether they must acquire more market power to earn higher profits and become more solvent – or at least to be perceived as such. This issue regarding the relationship between market power and bank risk is not trifling, particularly for banking regulators. Should regulators encourage banking institutions to price their products much higher than their marginal cost, to earn higher profits, to increase their capital ratios and other safety financial buffers and to bolster their resilience (Marcus, 1984; Smith, 1984; Keeley, 1990; Repullo, 2004)? Conversely, should banking regulators aim to reduce banks' market power, as higher rates and fees constrain both borrowers and consumers from taking on more risk, thus threatening the stability of the banking system (Boot and Greenbaum, 1993; Hellman et al., 2000; Matutes and Vives, 1996; Boyd and De Nicoló, 2005)?

Both market power–stability and market power–fragility paradigms have been studied theoretically, and these studies have led to convincing arguments on both sides. Under the first view, to compensate for their reduced franchise value, less market power encourages banks to engage in activities that promise higher returns, which are also riskier (Marcus, 1984; Keeley, 1990). This fragile banking environment is exacerbated by the unwillingness of banking institutions to provide liquidity to their vulnerable counterparts (Allen and Gale, 2000) and, more generally, to support interbank cooperation and assistance (Saez and Shi, 2004). Conversely, more market power allows banks to earn higher profits that can serve as capital buffers (Allen and Gale, 2004; Boyd et al., 2004) and to increase banks' resilience to external macroeconomic and liquidity shocks. This also allows banks to collect more private information (Hauswald and Marquez, 2006), thus reducing the risk of loan defaults.

The arguments in support of the market power–fragility paradigm are as numerous and as convincing. Some of these arguments plead in

E-mail address: ion.lapteacru@u-bordeaux.fr.

http://dx.doi.org/10.1016/j.econmod.2017.01.022
Received 22 September 2016; Received in revised form 21 December 2016; Accepted 30 January 2017

favour of more competitive banking markets, because banks with more market power are encouraged to increase their interest rates and to thus originate riskier loans in greater amounts (Caminal and Matutes, 2002; Boyd and De Nicoló, 2005). Moreover, such banking institutions are more likely to be transformed into "too-big-to-fail" institutions (Mishkin, 1999, 2006; Barth et al., 2012), which ultimately threatens the stability of the banking system.

These different theoretically sound arguments are also supported by empirical studies. Some of these studies confirm the market power–stability paradigm for both Latin American (Yeyati and Micco, 2007) and Asian (Liu et al., 2012; Fu et al., 2014) banking markets. Other studies support the market power–fragility paradigm for Western European and US banks (Schaeck and Cihak, 2008). Our study is in line with this series of empirical investigations and attempts to determine which of these two paradigms holds for the CEE banking markets.

As in other emerging countries, we might expect that the market–power stability paradigm prevails in CEE countries. Indeed, the undercapitalisation of CEE banks and their insufficient margins and profits – due to the unconstrained openness of these banking markets and to fierce competition – were important causes of many bank failures during the early stages of post-socialist transition. Therefore, because of new regulatory constraints and because it was necessary to strengthen their solvency, CEE banks bolstered their capitalisation, their liquidity cushions and other financial stability buffers. Moreover, they might have achieved this result at least due in part (and eventually) to their increased market power. We hope that our findings might guide bank regulators in these new European Union members regarding the market power that their banks must have to ensure banking system stability.

We test the linear and non-linear relationships between CEE banks' market power and their risk levels; in particular, we examine the asymmetric impact of market power on risk in terms of bank characteristics, banking system features and macroeconomic conditions. We also propose certain original methodological extensions of the previous empirical banking literature.

First, prior studies have mainly used either accounting-based or market-based measures of bank risk. We employ both types of measures, *i.e.*, the Z-score and the Distance to Default. The first describes how well banking institutions are capitalised with respect to the distribution of their returns. The second measure is computed using the Black and Scholes (1973) and Merton (1974) option models, and it measures market perceptions of bank risk. As for the market power measure, we use the Lerner index, which is the mark-up of price over banks' marginal costs. According to the structure-conduct-performance paradigm, market concentration allows banks to set their prices above their marginal costs; with this in mind, we complement our study with a concentration measure. Finally, we confirm our main findings using the Lerner index adjusted for cost and profit inefficiencies, as suggested by Koetter et al. (2012) and Clerides et al. (2015), and by applying the Boone indicator as another measure of market power.

Second, the Z-score is originally related to the probability that a bank's losses exceed its capital; thus, the higher the Z-score, the lower a bank's probability of default. However, few studies explicitly take this concept into account, and when they do, it is only under very restrictive assumptions regarding the normal distribution of banks' returns. Therefore, we follow Lapteacru (2016a) and construct an improved Z-score using a stable distribution function for banks' returns that has the impressive advantage of being flexible and able to consider the skewness (a major shortcoming mentioned many times in the banking literature), kurtosis and sharpness of data. Our findings are complemented by Z-score measures estimated using the skew normal distribution function (another way to handle the skewness) and under the traditional approach.

Third, in our two-step econometric model, we make a precise adjustment for standard errors in the risk equation. The Lerner index, which is estimated using the regression results from the first equation, is typically employed in the risk equation with no adjustment. A few empirical studies that account for the embedding of these two equations have applied the bootstrapping procedure (Schaeck et al., 2009; Buch et al., 2013). However, this method does not take into account the results of the first equation – neither in terms of its parameters nor in terms of its variance-covariance matrix – and does not therefore consider the possible correlation between these results and those of the second equation. Thus, we apply an exact adjustment proposed by Murphy and Topel (1985, 2002) and developed by Lapteacru (2016b) for panel data models specifically for application to our subject.

In seeking to find the relationship between the market power of CEE banks and their risk, we first describe our methodology, *i.e.*, the estimation of the Lerner index, the computation of both risk measures described above and the construction of the market power–risk equation. In Section 3, we describe our data and variables, and explain our empirical results. Robustness checks are discussed in Section 4, and we conclude in Section 5.

2. Methodology

To determine the effects of market power on banks' risk-taking, we propose a two-stage econometric model. At the first stage, we estimate the Lerner index, which is our measure of market power, and, at the second stage, we determine the relationship between market power and risk. In contrast to the previous literature, this two-stage approach allows us to consider the (im)precision with which the Lerner index is computed (at the first stage) in the market power–risk equation (at the second stage). Our proposal consists of embedding the variance-covariance matrices obtained for each country from the first-stage regression into the second equation. In this manner, we provide true adjustments to estimators of the market power–risk equation and do not have to use an approximating distribution, as bootstrapping does.

To measure bank risk, we use the Z-score and the Distance to Default.

2.1. Measure of bank market power

The Lerner index is the most widely used measure of market power applied in the empirical literature on banking (Fernández de Guevara et al., 2007; Berger et al., 2009; Carbó et al., 2009; Weill, 2013; among many others). It measures the mark-up of price over a bank's marginal cost:

$$Lerner_{it}=\frac{p_{it}-\frac{\partial C_{it}}{\partial y_{it}}}{p_{it}}, \quad (1)$$

where p_{it} is the average price of bank i's output at time t, C_{it} is the bank's total cost and y_{it} is its output. Banks have no market power if $Lerner_{it}=0$, and the bank's market power increases as the $Lerner_{it}$ variable increases.

The econometric task is thus to estimate banks' marginal cost, $\partial C_{it}/\partial y_{it}$. For bank output, some authors use the total amount of loans (Pruteanu-Podpiera et al., 2008; Solís and Maudos, 2008), whereas others apply total assets (Fernández de Guevara et al., 2007; Carbó et al., 2009; Weill, 2013). To make a more thorough assessment of the cost function, we consider three bank products that are principal sources of revenue for CEE banks: non-financial loans, bank loans and investment assets. We also consider three inputs: funds, labour and physical capital. Our cost function therefore takes the following translog form: