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Main determinants of efficiency and implications on banking concentration in the European Union

Rafael Bautista Mesa*, Horacio Molina Sánchez, Jesús Nicolás Ramírez Sobrino

Universidad Loyola Andalucía, Córdoba, Spain

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ABSTRACT

This study aims to measure the main determinants influencing bank efficiency. We suggest that the bank efficiency ratio, obtained from the income statement, is positively related to the size of a bank in terms of total assets. However, we believe that such a relationship cannot be maintained for banks over a certain size. By the use of the regression analysis method, we analyze the link between bank efficiency and bank size, using a sample of 3952 banks in the European Union. Our results show that the efficiency ratio stops improving for banks with total assets over $25 billion. Previous literature, using different analysis techniques, does not reach an agreement on this point. Furthermore, our study identifies further variables which negatively affect the efficiency of banks, such as competition and lending diversification, or affect them positively, such as the wholesale funding ratio and income diversification. Our findings imply the need for different bank policies depending on total assets, in order to limit the size and activities of banks.
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Principales determinantes de la eficacia y repercusiones en la concentración bancaria en la Unión Europea

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RESUMEN

El estudio tiene como objetivo la medición de los principales factores influyentes en la eficiencia bancaria. Se sugiere que el ratio de eficiencia bancaria, obtenido de la cuenta de resultados, está positivamente relacionado con el total de activos. Sin embargo, esta relación no se mantiene para los bancos de mayor tamaño. Mediante el uso del análisis de regresión, se analiza la relación entre la dimensión de los bancos y su ratio de eficiencia, teniendo en consideración 3.952 bancos de la Unión Europea. Los resultados muestran que el ratio eficiencia deja de mejorar para bancos con un total de activos superior a 25.000 millones de dólares. La literatura previa, usando diferentes técnicas de análisis, no alcanza un consenso en este respecto. Adicionalmente, el estudio identifica otras variables que afectan negativamente a la eficiencia bancaria, tales como la competencia o la diversificación en la inversión, o positivamente como el ratio de financiación mayorista o la diversificación en ingresos. Estos hallazgos apoyan la necesidad de diferentes políticas bancarias en función del total de activos, con el propósito de limitar el tamaño o las actividades de la banca.
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Introduction

In recent years, Europe and the United States have furthered the trend of concentrating banks in response to the financial crisis. Dermine and Schoenmaker (2010) summarize that some of the

* Corresponding author.
E-mail address: rbautista@uloyola.es (R. Bautista Mesa).

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largest bank mergers that have taken place have been a consequence of the financial crisis. For instance, Bank of America acquired Countrywide and Merrill Lynch in the U.S., while Belgium's Fortis was sold to France's BNP-Paribas and in the UK Lloyds Banking Group was created through the merger of Lloyds TSB and HBOS. In the European Union (EU), where 60% of total assets are held by only 37 entities (European Central Bank, 2011), there is a high degree of concentration in the banking market. Even so, the benefits of this trend are controversial.

We find many arguments trying to demonstrate the advantages or disadvantages of a highly concentrated banking system, which can be classified into one of the three following categories: (i) the influence of the banking concentration on financial stability, (ii) the impact of the banking consolidation process on the difficulties of companies accessing credit, and (iii) the improvement in banking-system efficiency levels.

Firstly, previous studies regarding the relation between bank concentration and risk, for instance, analyzed the link between financial crises, bank concentration and regulation of banking markets (e.g. Beck, Demirgüç-Kunt, & Levine, 2006). They argue that a less concentrated market is more sensitive to a financial crisis and state a positive relationship between the financial stability of the banking system and the concentration of its entities.

There are several arguments used to explain this relationship. On the one hand, bank concentration through larger institutions seems to favour these entities' growth in assets and profits of, which would make them less vulnerable to possible financial crises, improve their chances of diversification and reduce managers' needs to assume excessive risks (Hellman, Murdock, & Stiglitz, 2000).

On the other hand, an argument that traditionally justifies the positive relationship between the stability of the banking system and a high level of concentration is that, apparently, the banking supervisor's work becomes considerably easier in a more highly concentrated system. Allen and Gale (2000) argue similarly, basing their comparison on the history of bank failures between the United States (US) and more concentrated countries like Canada or the United Kingdom (UK).

In contrast, we found empirical evidence showing that large banks face higher exposure to market risks and also a greater likelihood of systemic risk contagion (De Jonghe, 2010). Vallascas and Keasey (2012) show that banks with the highest relative Gross Domestic Product (GDP) of the country where they reside have a greater propensity to fail when facing negative events in the country's economy.

Secondly, some authors found several undesirable consequences due to the reduction in market competition, such as the increasing difficulties and costs of accessing credit. Craig and Hardee (2007) suggest that small companies face greater financing difficulties in regions with more highly concentrated banking markets with just a few large entities. Cyree and Spurlin (2012) find a positive relationship between the entry of large entities into a rural market and the increase in interest and commission income of small entities that previously existed in that market, suggesting that larger entities trigger higher financing costs for borrowers. However, other authors state that, although the bank concentration reduces small business lending, such reduction is mostly offset by the reactions of other banks (Berger & Mester, 1997; Berger, Saunders, Scalise, & Udell (1998)).

Finally, a traditional argument used to justify the bank concentration process is that larger entities are supposed to demonstrate greater efficiency, which will be analyzed in the following sections.

The objective of our study is twofold. On one hand, the variables influencing the efficiency ratio of banks are examined. On the other hand, we answer the question of whether behaviour varies with respect to efficiency in response to an increase in bank size.

Although it is commonly accepted that the efficiency ratio of an entity is related to its size, as our first contribution we believe that this relationship is not positive for extremely large entities. We also assume that it is very meaningful for other magnitudes of the entity as well such as the level of competition, lending diversification or the wholesale funding ratio and income diversification. The implications of these findings support the need for limiting the size and activities of banks, not only in terms of risk but also in terms of efficiency.

It appears there is not only one single model for all banks. For instance, Fernández-Laviada, Martínez-García, and Montoya del Corte (2007) note the positive relationship between bank size and the use of derivatives. Thus, findings about the reasons behind different levels of efficiency have important implications for both managers and bank supervisors (Berger & Mester, 1997). Liquidity and solvency requirements should differ depending on the specific characteristics of each entity, such as its size, competition, business strategy or financial and investing structure. Focusing on the EU, our research is expected to shed light on bank policies in order to place more emphasis on aspects other than the concentration process.

Section 2 of our study provides a literature review about the drivers influencing bank efficiency, and supports our hypotheses. Section 3 includes the sampling upon which our study is based and specifies the methodology applied. Section 4 shows the main empirical findings on the explanatory variables of the efficiency ratio and the differences between the largest banks and the rest of entities. In the last part of our study, we provide our conclusions and implications for research and practice.

Determinants of bank efficiency

Although the measuring of efficiency levels may vary according to different analyses (technical efficiency, cost or profit efficiency, different financial efficiency ratios, etc.), their relevance in credit institutions has been highlighted by previous research because of its influence on other variables in the banking system. However, the results of previous analyses on bank efficiency also reflect some controversy. According to Hughes and Mester (1998), it would be necessary to link capital requirements to the efficiency ratio, and authorities must allow most efficient banks to assume a higher risk in their investments. In this regard, Berger and DeYoung (1997) show that phenomena impairing assets are preceded by reductions in the level of the bank's efficiency.

Overall, the efficiency ratio from the income statement of a credit institution aims to measure the percentage of the gross income represented by overheads. According to Andries (2011, p. 48) some of the factors which influence bank efficiency "are manageable by the bank, such as resources used, technology employed, size of assets, amount of capital invested, organizational structure, and management style, as well as exogenous factors that do not depend solely on the management of the bank, such as specific legislation, market share, and price and availability of resources". Some of these will be considered within this study.

However, in our attempt to ascertain the factors that influence the efficiency of a credit institution, this paper uses the main variables identified by previous literature as representative of the banking industry, not only in terms of efficiency but also in terms of risk. Fiordelisi, Marqués-Ibáñez, and Molineux (2011) suggest that lower bank efficiency levels precede greater risk in the future. Vallascas and Keasey (2012) suggest that the size, the share of income derived from trading and the financial leverage of a bank have a relevant relationship with the level of risk, more than other traditional variables such as the capital regulatory ratio, the off-balance over total assets ratio or the amount of liquid assets.

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