THE DETERMINANTS OF PERFORMANCE IN FINANCIAL INSTITUTIONS: AN APPLICATION TO SPANISH SAVINGS BANKS

Dr. Patricia Bachiller*

ABSTRACT

This paper analyses the determinants of the performance of Spanish savings banks. We study whether efficiency, core capital, the delinquency ratio, liquidity, the number of branches and profitability influence the performance of these entities. We find evidence that efficiency and core capital lead to greater performance. However, the results indicate that the higher the delinquency ratio, the lower the performance will be. Entities that opened new branches uncontrollably, without an analysis of their viability and profitability, now have a network which clearly decreases their performance. Only the entities that have maintained a solid core capital can maintain their position during the financial crisis. They had greater financial strength and more ability to recognise provisions without excessively damaging their capital and, thus, their solvency.

Keywords: savings banks, performance, financial crisis, Spain

JEL: G.21, H.10, L.30

* Francisco-de-Borja Lasa

1. INTRODUCTION

Spanish savings banks have proven to be the weakest part of the national financial system (Parejo et al. 2010). The vast majority of the 45 savings banks that existed three years ago have been nationalized or transformed into banks (loosing importance in the long term, as in other European countries), and few of them have maintained the spirit of savings banks. Autonomous communities have lost their influence over savings banks that were nationalized, which the Spanish central government now controls. In other European countries (UK, Italy, France), the model of savings banks has disappeared. Only in Germany does it remain, but with a well-established model quite different from the Spanish model. German savings banks have major operational constraints and their ownership is not diffuse, as it was in Spanish savings banks. In Spain, conflicting governance played a determining role in the outcome of these entities (Crespí et al., 2004; Tortosa-Ausina et al., 2008). There has been some delay in implementing solutions. Banks and savings banks have been converted into the largest real estate owners with a stock of unsold houses of over one million units. The traditional construction sector has stalled, creating a vicious cycle of more unemployment, less consumption and more deficits, which is difficult to break. The latest measures taken by the government are aimed at encouraging the sale of property by the banks but the housing market is deteriorating and the demand is weak. This should have been done before when the market was still alive.

Today, only 2 small savings banks and 4 groups remain. For years, savings banks grew in an unsustainable and disorganized way by opening new branches and expanding throughout the country, accessing zones outside their core area. With the global economic crisis, which later becomes a debt crisis, the savings banks have become indebted and have a high percentage of credits in their balance sheet, which generates a greater risk of insolvency. The unnecessary

excess of productive capacity, based on a growth of promoters and builders loans, with high default risks, was not well-assessed at the time. Excessive borrowing in wholesale markets, which caused a significant weakening of their core capital, and the high rate of default ratio in Spain, led to their balance sheets being flooded with property assets that lost their value daily. The government was left with no other choice but to intervene in the majority of savings banks, resulting in the nationalization of many of them.

In this paper, we study what really happened to the savings banks and why they have been transformed into commercial banks (García-Cestona and Surroca, 2008; Bachiller y Lasa, 2013), as well as the structural imbalances that have occurred. To do so, we carry out a study of the economic factors that determine the performance of Spanish savings banks, that is, we test specific indicators and variables of financial institutions and their effects on their performance. Some conclusions that reflect the reality of the situation of financial institutions have been obtained. The variables analysed are: the efficiency ratio (euros spent, primarily on personnel and structure, for each euro obtained; the core capital that gives strength to the entities; the default rate of loans to individuals, businesses and institutions; the liquidity of the entities; the number of offices opened in Spain and net interest income from liabilities (deposits) and assets (financing). These variables were chosen to analyse the performance of these financial institutions, distinguishing between those that have had a high degree of success and those that have not survived because of their weakened situation.

The paper is organised as follows. In the next section, we develop the hypotheses. The third section details the research methodology and data used in the analysis. The fourth section shows the empirical results and, finally, the discussion and conclusions are contained in the fifth section.

2. HYPOTHESES

The scope and framework of this study can be explained by the changes that have taken place in the role of the savings banks in recent years in the Spanish financial sector. In this section, we analyze the factors that contribute to explaining the performance of savings banks and we develop our hypotheses.

The efficiency ratio compares the operating expenses and revenues. An entity that seeks to be more efficient by obtaining higher revenues from lower expenses can either reduce expenses and maintain the quality of service or increase revenues without incurring more expenses (Prior, 2003). As financial expenses are the same for all entities (legal cost of money), the way to obtain more revenues is to pay deposits with a lower interest rate or to charge credits with a higher interest rate. A savings bank can also increase its efficiency by reducing operating expenses such as salaries, central services expenses, number of branches, technology expenses and buildings. If we analyse the recent situation, we can see that the Spanish financial "tsunami" has led entities to reduce costs in recent years to compensate for losses and the impairment of assets. Savings banks have decreased staff costs to obtain a higher operational efficiency. Other expenses that have been reduced are the rents of branches, custodial fees, security costs, communications costs, etc., in order to be more competitive and efficient. As margins have been cut, entities have launched plans to reduce costs by up to 20% and have closed branches. If savings banks are able to keep their number of clients despite closing branches, gains emerge from savings in staff and rental costs. However, cost reduction does not necessarily imply an improvement in efficiency (Tortosa-Ausina, 2002; Carbo et al., 2003) as the evolution of income also influences this magnitude. Currently, as incomes are decreasing, efficiency in the banking sector is worsening. To solve this problem, mergers are taking place to obtain long-term synergies and increase

profitability (Bernad et al. 2013). However, results about the benefits derived from mergers are not consistent (Gutiérrez Fernández et al. 2013).

An entity with a better efficiency ratio significantly improves its profit and, consequently, its ROA. In line with this, Hermalin and Wallace (1994) find that inefficient financial entities are, indeed, more likely to fail.

H1: Savings banks with a greater efficiency ratio obtain a better performance.

The core capital of a financial entity is made up of nominal capital and reserves and defines its solvency level. A higher core capital indicates that an entity has a higher equity compared to risk-weighted assets. These assets include deposits from central banks (no risk) and industrial interests with a high risk. Entities should decrease risky assets and increase their equity, but savings banks are private foundations and cannot issue equity. An entity that has a higher core capital is more solvent and its credits to clients are expected to have a lower default risk.

The relationship between the core capital and performance is not direct. Five years ago, some savings banks had relatively a lower core capital but bigger profits. This was because entities obtained higher profits at the expense of a higher risk. To avoid this, the regulator has become stricter with financial entities and, now, the core capital must be higher than 8%. In the long-run, a higher core capital is indicative of a higher performance. The determinant factor of the core capital is not the equity of the entity but the risk-weighted assets, which indicates the entity's capacity to generate revenues.

H2: When a savings bank has a higher core capital, it obtains a better performance.

The delinquency ratio consists of the ratio of default credits over total credits. The higher this ratio is, the fewer the opportunities to obtain revenues, which has adverse effects on the

performance of the entity. The delinquency ratio establishes the quality of credits and their risk. An entity that analysed credit risk during the economic boom years will have a better delinquency ratio than those entities that gave credit without quantifying risks.

As a consequence of the economic expansion, Spanish savings banks expanded their business by opening branches in areas affected by the bust in house prices (Illueca *et al*., 2009). With this practice, savings banks captured property developers as clients. When housing prices fell, savings banks had to include properties on their balance sheet and property developers defaulted on their credit. As Moody´s Investors Service (2006) indicates, some savings banks had 24,000 million of euros of default credit from property developers when they were inspected. When business expansion is based on investments in buildings without risk analysis, the delinquency ratio increases and performance decreases.

H3: Savings banks with a lower delinquency ratio obtain a better performance.

Liquidity can be defined as the degree to which an asset can be bought or sold in the market without affecting its price. As it is a temporal indicator of its economic situation, an entity can have a good liquidity position in the short term because of an excess of debt, but this does not mean that it will be able to meet its responsibilities in the long term. When a financial entity cannot meet its payment obligations, it is more vulnerable, especially in the current economic situation in which it is expensive and difficult to find funding in the market and, as a result, the lack of liquidity leads to savings banks into debts. The extra cost derived from higher interest rates affects the income statement.

An entity that does not have the capacity to pay its loans due to a lack of liquidity can cause panic in the financial system due to default risk. To avoid this, the European Union has introduced massive injections of liquidity into financial entities at a low cost. Liquidity does not

always cause an improvement in the performance of the entity, but its absence can generate a worse performance.

H4: Savings banks with a higher liquidity obtain a better performance.

In the period of economic growth, savings banks opened branches to expand their business and to be more efficient and profitable. The higher the number of branches, the higher the economies of scale (for example, economies of scale through central services). Financial entities also opened branches to be present in most Spanish regions. This marketing decision aimed to improve the image of the entity.

The growth of Spanish savings banks was achieved by opening branches, which generates high overheads. In the crisis period, branches have become non-profitable and have burdened the income statement, the opposite of what was intended. It was necessary to close offices, supposedly maintaining the volume of business with those that remained open, reducing personnel costs, rent, etc.

The variable "number of branches" does not follow a fixed criterion of direct or inverse relation. Depending on the economic cycle and on the over-sizing of the entity, it may have one implication or another (Maudos et al., 2002; Grifell-Tatje and Lovell, 1996; Lozano-Vivas, 1997). In a period of economic expansion, if the entity is small, in order to expand, it must increase the number of its offices, capture new business and increase its volume of activity. If the entity is large, increasing the number of offices does not lead to improved profitability, unless it expands into new geographic areas. Under recession, it is always true that improved performance is achieved by reducing the number of offices. As the entity was oversized, it should reduce its costs, trying to maintain the business achieved in the expansionary phase.

If the entity has expanded cautiously in the expansionary phase of the economy, it could maintain its business more easily in the recessionary phase. In recent years, the number of branch closures has been very high, particularly in the savings banks that had expanded more.

At this time, in Spain, the entity with the greatest solvency and one of the best ROAs is an entity with very few branches. But there is no clear relationship between these two variables as, some of the largest entities have among the best performances and others among the worst.

H5: Savings banks with fewer branches obtain a better performance.

The main activity of a savings bank is based on capturing customer money to lend to other customers. Since the overall interest rate that is paid to the lender is less than the interest rate that the borrower receives, it generates a margin. Net interest income is the most important item in the income of the entity (supplemented by utility commissions and other concepts) and has a direct relationship to performance. In addition, this indicator is affected negatively by the default rate.

Therefore, there is a direct relationship between the margin and the ROA of the entity. However, an entity with high net interest income, but with a portfolio of industrial stocks and real estate that loses value continuously under the crisis, may be unable to offset this loss with its high margin, which leads to a lower ROA.

Savings banks have carried out other activities than the traditional financial business, such as investment in the building sector, which has suffered from loss of value its assets. Entities more inclined towards the traditional financial business have obtained an increase in net interest income and, consequently, a better profitability.

H6: The net interest income of a savings bank is directly related to the ROA.

3. METHODOLOGY AND DATA

We have used the panel data methodology to analyze the factors that determine the performance of savings banks. Our database is made up of observations of 38 entities over 4 years (2006-2009), that is, we combine cross-sectional and longitudinal data. We then run panel data estimations to explain the determinant factors of quality. Panel data estimation is, without doubt, the most suitable method of capturing the variation of our indicators over time since it is able to control for individual, firm-specific heterogeneity as well as for temporal changes in the firms' operating environment. Data is collected from the annual reports from savings banks for 2006 to 2009.

To analyze performance, we use return on assets (ROA) as the dependent variable. This profitability indicator is calculated by dividing revenue by total assets. We focus on the financial dimension of the savings banks' performance. Hodge (2000) shows that only a few performance indicators are common across studies and, among these, profitability is the most frequently used.

The variables used in the study as explanatory factors of the performance of savings banks are (see Table 1):

- Efficiency. Efficiency ratio defined as general, administrative and amortization expenses over profit margin. The higher the ratio, the more efficient the entity. This variable has been inversed to facilitate its interpretation.

- Core capital. Defined as the equity capital and reserves (or retained earnings) to risk-weighted assets ratio. We introduce this indicator because it is indicative of the entity's risk.

- Liquidity. Ratio calculated as credits over deposits. It is an indicator of the dependence of entities on funding requirements.

- Delinquency. Ratio defined as past-due credits divided by total credits. This variable measures the quality of a bank's loan portfolio.

- Branches. The number of branches has been included as a variable in the regression because the period analysed coincides with the great expansion of savings banks in Spain.

- Intermediation margin. The intermediation margin, defined as the sum of net interest income from financial service activities. The intermediation margin is indicative of the traditional business of the banking sector: granting credit and capturing deposits.

Table 1: Descriptive statistics of variables

Variable	Observations	Mean	Standard deviation	Minimum	Maximum
ROA	164	0.56	0.55	-3.14	1.80
Efficiency	168	51.48	10.10	29.04	82.68
Core capital	150	7.68	2.09	2.02	14.60
Liquidity ratio	167	109.23	22.35	79.99	218
Delinquency ratio	167	2.31	1.88	0.31	9.71
Branches	168	579.56	881.60	18	5758
Intermediation margin	168	429.02	629.24	7.66	3922

With this information, a regression is run to study the relationship between performance and several factors (efficiency, core capital, liquidity ratio, delinquency ratio, branches and intermediation margin).

$$ROA_{it} = \beta_0 + \beta_1 \text{ Eficiency}_{it} + \beta_2 \text{ Core\_capital}_{it} + \beta_3 \text{ Liquidity}_{it} + \beta_4 \text{ Delinquency}_{it} + \beta_5 \text{ Branches}_t + \beta_6 \text{ Intermediation Margen}_{it} + \varepsilon_{it}$$

Panel with T = 4 and N = 38.

4. RESULTS OF THE STUDY

In this section, the results obtained using the panel data methodology are presented. Firstly, we analyze whether there is correlation between individual effects and the explanatory variables. As we have commented, to ascertain whether fixed or random effects are the more appropriate specification, we employed the Hausman (1978) test (see Table 2).

Table 2: Hausman (1978) test

Hausman Test
$Chi^2(4) = 10.07$ $Prob>Chi^2 = 0.1219$

The Hausman test indicates that the random effects estimator is efficient. This test allows us to conclude that the random effects model is the most efficient estimation.

Besides the choice of model, we must consider autocorrelation and heteroscedasticity. Autocorrelation arises when errors are not independent and heteroscedasticity means that there is a non-constant variance for the error term. Table 3 presents the Wooldridge (2002) and White tests, which analyze the correlation problems and the possible heteroscedasticity, respectively.

Table 3: Wooldridge and White (2002) and Breusch-Pagan (1980) tests

Wooldridge Test	Breusch-Pagan Test
Chi2(4) = 0.117 Prob>chi2 = 0.7347	$Chi^2(1) = 13.20$ Prob>Chi2 = 0.9348

The Wooldridge test indicates that there is no correlation in the panel data. With the Breusch-Pagan test, the null hypothesis is accepted, so we can assert that the variance is constant and there is no heteroscedasticity.

Table 4 presents the results of the model corrected for autocorrelation with an autoregressive model that controls for dependence between periods.

Table 4: Panel data regression analysis

Variable	Coefficient	Std. Error	Z-Statistic	Prob.
Constant	**0.5902869**	0.2640609	2.24	0.025
EFFICIENCY	**0.0059722**	0.002701	-2.21	0.027
CORE CAPITAL	**0.0781742**	0.0118457	6.60	0.000
LIQUIDITY	0.0005135	0.0012911	0.40	0.691
DELINQUENCY	**-0.1594029**	0.0127015	-12.55	0.000

BRANCHES	-0.0000555	0.0000867	-0.64	0.522
INTERMEDIATION MARGIN	0.0001384	0.0001331	1.04	0.299
$R^2 = 0.5461$ N=38 Wald $Chi^2 = 266.48$ Prob>chi2 = 0.000				

As can been observed, there are three statistically significant variables in the regression: efficiency, core capital and delinquency. The Wald test indicates statistical significance in the model.

- The coefficient of efficiency is positive, so this variable is directly related to the performance of savings banks. That is, when a company is more efficient, it shows a better performance than when it is less efficient. This result is coherent with our initial hypothesis (a more efficient entity obtains a better performance). When a savings bank saves costs, it manages its resources optimally and its ROA is higher.

- As can be seen, the variable core capital is positively related to performance. That is, when the core capital is higher, the savings bank obtains a better performance. This supports our hypothesis that an entity that manages its risk efficiently is more profitable and has a better performance.

- In our model, the liquidity ratio is not related to performance, so we cannot accept our hypothesis. A higher dependence on external funding is not an explicative factor of the performance of a savings bank.

- The delinquency ratio is inversely related to performance. This supports our hypothesis that a savings banks with fewer past due credits obtains a poor profitability. This relationship indicates that the credit risk generates a worse performance.

- The variable branches is not related to the ROA of savings banks. The performance of savings banks does not depend on the number of branches, but on the profitability obtained in each branch.

- Finally, the intermediation margin is not related to the ROA. This is not consistent with our hypothesis but it is logical because commissions and other products not included in this margin also determine the profit of savings banks.

5. DISCUSSION AND CONCLUSIONS

Entities that a have managed their resources better, without getting involved in over-dimensioned structures (personnel and outlets), and with continuous improvement of their production processes, have managed to control their expenses to a greater extent. With the significant drop in revenues in recent years due to the narrowing of interest margins, the efficiency ratio has become one of the main indicators of resource optimisation and of the improvement in productivity and performance of the entities. Those that did not attend to this aspect in the good times could not sustain a positive bottom line with the decrease in incomes. Logically, those who have efficient production systems, and have optimized their expenses, have been able to survive in the current financial situation.

Similarly, those entities that built large portfolios of investments in the business and construction sectors have left their balance sheets in a precarious situation, as their core capital is very weak and with very high risks. Only the entities that have managed to maintain a solid core capital have been able to hold their position during the financial crisis, in spite of the significant increase in normative requirements from the Spanish government. They had greater financial strength and ability to recognise provisions without excessively damaging their capital and, thus, their solvency.

The type of credit provided to the public administrations and private clients is a very important variable for the study of performance. Those entities that provided credit without prudent risk assessment suffered from a higher default rate on these loans, which obviously lowered their performance. This was the result of the important provisions that have been set by national and international supervisors and also of the defaults of real estate developers, builders and private customers. These assets are incorporated into the banks' balance sheets but, in the current real estate situation, they lose value continuously.

For entities with no liquidity problems (high ratio), it is easier to survive the financial crisis today because they can carry out the provisions demanded by supervisors, without excessively affecting their core

capital, and deal with the short and medium term payments. Fortunately, the liquidity crisis was softened by the European Union through massive injections of money. Even so, only the savings banks with the highest liquidity ratios obtained better performance.

Entities that opened new bank offices uncontrollably in the past, without a proper analysis of their viability and profitability, in the euphoria of real estate loans, now have a network that is damaging for them, both at the personal and structural level, causing a clear drop in performance. Those that, in the era of expansion, expanded in a moderate way, balancing credits and savings, have achieved scale economies in a sustainable way and probably will be strengthened by the current situation.

Net interest income established in the past is a very important variable for future performance. An entity that grew through giving credits to high risk customers experienced a very negative impact on its current and future performance. Today, business in financial institutions is largely influenced by their past business. Most of the revenue of the entities comes from past operations that have endured over time. Entities that put very cheap credit on the market with low intermediation margins now have default problems. On the liabilities side, as the product generally is short term, the past is less influential (deposits have low interest rates) but, if the entity needs urgently to capture deposits, it has to give them back at a higher price with the consequent losses in its income statement. A higher net interest income substantially improves the performance of the entity.

Acknowledgments: This study has been carried out with the financial support of the Regional Government of Aragón and the European Social Fund through Research Project S05 and the University of Zaragoza through Research Project UZ2014-SOC-05.

REFERENCES

Bachiller, P. & Lasa, B. (2013) 'La estrategia errónea de la cajas de ahorro y su futuro incierto'. *Revista AECA*, 102, pp. 36-38.

Bellod, J.F. (2011) Crisis y reforma de las cajas de ahorros en España. Contribuciones a la economía.

Bernad, C., Fuentelsaz, L. & Gomez, J. (2013) 'The consequences of mergers on the profitability of Spanish savings banks'. *The Service Industries Journal*, 33, 2, pp. 266-278.

Carbo, S., Gardener, E.P.M. & Williams, J. (2003) 'A note on technical change in banking: the case of European savings banks', *Applied Economics*, 35, 6, pp. 705-719.

Crespí, R., García-Cestona, M.A. & Salas, V. (2004) 'Governance mechanisms in Spanish banks. Does ownership matter?' *Journal of Banking & Finance*, 28, 10, pp. 2311-2330.

Deloitte (2012). Estudio europeo de precios de los servicios financieros minoristas. Madrid.

García-Cestona, M. & Surroca, J. 2008, "Multiple goals and ownership structure: Effects on the performance of Spanish savings banks", *European Journal of Operational Research*, 187, 2, pp. 582-599.

GrifellTatje, E. & Lovell, C.A.K. (1997) 'A DEA-based analysis of productivity change and intertemporal managerial performance', *Annals of Operations Research*, 73, pp. 177-189.

Gutiérrez Fernández, M., Palomo Zurdo, R. J. & Fernández Barberís (2013). 'Spanish savings banks: A claimed reordering under criteria of economic and social rationality?' *Cuadernos de Economía y Dirección de la Empresa*, 16, pp. 250–258.

Hermalin, B.E. & Wallace, N.E. (1994) 'The determinants of efficiency and solvency in savings and loans', *The Rand Journal of Economics*, 25, 3, pp. 361-381.

Hodge, G.A. (2000) Privatisation: an international review of performance. (Westview Press).

Ibercaja. Memoria anual. Caja de Ahorros y Monte de Piedad de Zaragoza, Aragón y Rioja. Zaragoza, abril de 2012. 748p.

Illueca, M., Pastor, J.M. & Tortosa-Ausina, E. (2009) 'The effects of geographic expansion on the productivity of Spanish savings banks', *Journal of Productivity Analysis*, 32, 2, pp. 119-143.

International Monetary Fund (F.M.I.) (2012) Spain: Financial System Stability Assessment [Evaluación de la estabilidad del sistema financiero español]. Washington, D.C., 30 de mayo de 2012. 77p.

Lozano-Vivas, A. (1997) 'Profit efficiency for Spanish savings banks', *European Journal of Operational Research*, 98, 2, pp. 381-394.

Maudos (2012), J. El sector bancario español en el contexto internacional. El impacto de la crisis. Fundación de las cajas de ahorros e Instituto valenciano de investigaciones económicas. Madrid. 2012. 21p.

Maudos, J., Pastor, J.M. & Perez, F. (2002) 'Competition and efficiency in the Spanish banking sector: the importance of specialization', *Applied Financial Economics*, 12, 7, pp. 505-516.

Moody´s Investors Service, INC. Banco de Valencia, S.A., Junio de 2006. Tomo 403, nº 8785. Londres, 19 de mayo de 2012. ISSN: 0013-0613.

Parejo, J.A., García, A.C. & Gámir, J.A.P. 2004, *Manual de sistema financiero español*, Ariel.

Prior, D. 2003, "Long- and short-run non-parametric cost frontier efficiency: An application to Spanish savings banks", *Journal of Banking & Finance*, 27, 4, pp. 655-671.

The Economist (2012). Dispatches from the hothouse; Spain Tomo 403, nº 8785. Londres.

Tortosa-Ausina, E. (2002) 'Bank cost efficiency and output specification', *Journal of Productivity Analysis*, 18, pp. 199-222.

Tortosa-Ausina, E., Grifell-Tatje, E., Armero, C. & Conesa, D. (2008) 'Sensitivity analysis of efficiency and Malmquist productivity indices: An application to Spanish savings banks', *European Journal of Operational Research*, 184, 3, pp. 1062-1084.

Wooldridge, J. (2002). Econometric Analysis of Cross Section and Panel Data, MIT Press, Cambridge.