Does it pay to be socially responsible? Evidence from Spanish retail banking sector*

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Abstract
This paper presents a theoretical and empirical analysis of strategic competition in retail banking when some of the financial firms are non profit organisations. Banking literature about competition is fairly large, but the strategic interaction between profit maximizing and non profit maximizers has not extensively analysed except for Purroy and Salas (1999). In this paper, we take a completely different approach. Using Hotelling’s two stage model of spatial competition, we develop a model to take into account consumer perceptions respect to the two different types of financial institutions. The empirical analysis confirms that consumers take into account other features different from the price, such as social contribution or closer service to make a mortgage decision. These conclusions are of interest in the debate about firm social or ethical activities. It is shown that if consumers value social activities, firms improve their results by behaving socially responsible.

JEL classification: D83, G21, D21.

Keywords: Strategic competition, Hotelling’s model, Spanish banking, Corporate social responsibility.

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1.-Introduction

The Spanish banking sector is a regulated industry where three kinds of institutions, commercial banks, saving banks and credit cooperatives compete under equal conditions in the loan, deposit and financial service market. The two main financial institutions: commercial banks and saving banks, that account for the 95 per cent of the loan and deposit markets have some distinctive features. One important difference has to do with the form of ownership. Commercial banks are privately owned and their shares are in hands of families, individual or institutional investors. On the contrary, savings banks have no formal owners and there is no market for its corporate control. Besides, they must either retain their earnings or invest them in social and cultural programs. Therefore, saving banks can be considered as “non-profit” organizations in the sense of Hansmann (1996) with a social contribution (Crespi et al., 2003).

Since savings banks ownership structure is diffuse managers might have effective control of the organizations. Orthodox theoretical thinking should lead to the conclusion that organizations with such loose ownership structure should clearly be outperformed when competing with efficient, profit maximising firms. However, this is not the case in the Spanish retail banking market. The erosion of commercial banks’ market share in favour of savings banks has occurred at the same time that the latter outperformed the former in profitability and solvency (table 1).

The social and cultural programs of savings banks account, nowadays, around 20% of their net profits (table 2) and may have two different targets. On the one hand, public good production (mainly cultural events), that can be socially enjoyed. On the other, production of services addressed to lower classes (grant programs) in order to reduce social wealth differences and exclusion (Valero, 2003). Although, there is a legal compliance with respect to these activities, regulatory provisions are vague and do not indicate the extent and objectives of the social investment. Accordingly, one would have expected this quantity to reduce as solvency has been encouraged by financial authorities in the last decade. However, we observe that the percentage invested in social activities has remained nearly stable (table 2) together with an increase in the valuation and recognition of these social activities by consumers and public opinion (CECA, 2004).

1 25% of profits go each year to these programs although the exact percentage depends on laws from the Region where the savings banks was first chartered and savings banks statutes.
Savings banks are viewed as firms that not only care about profits but also about the effects of their actions on consumers and society. This is precisely the main idea of the Corporate Social Responsibility (CSR) literature and of a socially responsible company.

The usual reasoning to incorporate CSR programs is either to reduce externalized costs or to avoid distributional conflicts (Heal (2004)). Recently, different strands of literature have been concerned with the effects of CSR. Some results emphasise that CSR practices divert firm resources, increase agency problems and affect negatively firm performance (Hellwig (2000) and Tirole (2001)). Others, on the contrary, show that CSR improve financial performance and the value of the firm (Cespa and Cestone (2002)).

Following this debate, the objective of this paper is to offer both, a theoretical approach and empirical evidence on the role that social activities have on Spanish retail banking system. Several papers have analysed Spanish banking system from different perspectives. Coello (1994), Saez et al (1994) and Manzano and Sastre (1995) study strategic competition and product specialization respectively. Gallardo et al. (1992) and Sanchez and Sastre (1994) study market share evolution. Purroy and Salas (1999) introduce an expense preference function to explain the better results of Spanish savings banks. Fuentelsaz and Gomez (2001) and Fuentelsaz et al (2002) analyse the entry effects of branch deregulation. We, instead, focus on the analysis of CSR activities and their effects on performance and profitability. To do so, we use a Hotelling set up\(^2\) (1929) to analyse the competitive game between commercial and savings banks when consumers recognise and value the social activities carried out by the latter.

Our contribution is threefold. First, unlike previous papers that have concentrated on deposits, we attempt to integrate both loans and deposits in the theoretical analysis. Second, as far as we are concerned, it is the first time that savings banks’ social activities are introduced explicitly in the analysis. Third, we evaluate the significance of CSR activities in the financial sector. Previous empirical tests have attempted to shed some light about CSR policies’ effects, but at least two kinds of problems arise. First, CSR can comprise many activities and very different in nature making results difficult to compare and generalise. Second, some studies analyse firms that are offering different products,

\(^2\) Matutes and Vives (1995) also apply this setting to banking industry, although they only include depositors.
hence the results about CSR may be biased or simply driven by the different features of products. Spanish banking sector and particularly the mortgage market is a very appropriate framework to overcome these weaknesses. Mortgage is a quite homogeneous product that is offered by commercial and savings banks that although have different networks compete in equal terms (Coello (1994)). Furthermore, information about savings banks’ CSR activities allows to distinguish between CSR practices that are different in nature and objectives, such as environmental initiatives or schooling grants making a more accurate and thorough analysis possible.

The paper is organized as follows, section two presents the model, section three presents the results from the strategic competition process. In section four the data is presented and the empirical analysis is carried out. Finally section 5 offers some conclusions.

2. Basic Model
2.1 Structure of the Economy

We consider a Hotelling set up (1929), that is, we assume a linear city of length 1 with a continuum of consumers uniformly distributed with density equal one applied to the analysis of the banking system. Each consumer has one unit of cash, that must be deposited in a bank. Accordingly, consumers are both depositors and borrowers with an inelastic credit demand $L$ as in Ciappori et al (1995). There are two banks located along the line at $a$ and $b$, where $a$ is the distance between point 0 and savings bank’s location, and $b$, the distance between point 1 and commercial bank’s location ($a \geq 0$, $b \geq 0$ and $1 - a - b \geq 0$). It is assumed that consumers incur in quadratic transportation costs when they either deposit or borrow money from the banks, and that these costs could be different for each product. These transport costs need not be interpreted as the cost of time spent “travelling” to the bank. Financial institutions can be differentiated because they provide different financial services, Matutes and Vives (1995).

Apart from objective differences of financial institutions, consumers have personal perceptions of each of the financial institutions that compete in the market. In

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3 For a thorough analysis see Freixas and Tirole (1998).
4 Deposit and credit markets are considered as separate markets.
particular, savings banks, partly as a result of the valuation and recognition of their social activities, enjoy a higher public image than commercial banks (CECA, 2004). To include this feature in our model we assume that consumers positively value these CSR activities of savings banks. The size or amount of these activities, that mean additional costs to savings banks, is equal to $P^5$.

Customers, then, have a sensitivity to this activity that is measured by $\theta$. Therefore, the total net utility of a typical consumer (depositor-borrower) can be written as:

$$U = (1 + r_D) - \alpha x_D^2 - (1 + r_L)L - \beta x_L^2 + \theta_i P$$

where $x_D$ (resp. $x_L$) is the distance from the bank where the consumer’s cash has been deposited (resp. where the consumer’s loan has been granted), $r_D$ (resp. $r_L$) is the interest on deposits (resp. the loan rate), $\alpha$ (resp. $\beta$) is the transportation cost parameter for deposits (resp. loans), $L$ is the inelastic credit demand (we assume that $L < 1$). As said above, $\theta_i$ is consumer’s sensibility to CSR behaviour and $P$ is the size of this behaviour.

Financial institutions can be of two types, commercial banks that maximize profits without any CSR behaviour and savings banks that maximize profits with the constraint of investing an amount $P$ in CSR operations\(^6\). The objective function of each is:

**Savings:**  
$$\pi_1 = D_1^D (r - r_1^D) + D_1^L L (r_1^L - r) - F - P$$

**Commercial:**  
$$\pi_2 = D_2^D (r - r_2^D) + D_2^L L (r_2^L - r) - F$$

where $D_1^D$ (resp. $D_2^D$) is the deposit demand for savings (resp. commercial) bank, $D_1^L$ (resp. $D_2^L$) is the loan demand for savings (resp. commercial) bank, $r_1^L$ (resp. $r_2^L$) is the loan rate of savings (resp. commercial) bank, $r_1^D$ (resp. $r_2^D$) is the deposit rate of

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\(^5\) Therefore, $P=0$ for commercial banks.

\(^6\) Therefore $\theta_i$ will be 0 for commercial banks and greater than 0 for savings banks. Although commercial banks are starting to have foundations to include this social responsibility aspect it takes time for consumer to recognise and value this behaviour.
savings (resp. commercial) bank, \( r \) is the constant return of a riskless investment technology (a security) and \( F \) is the fixed cost of establishing the branch.

There are two periods. At period 1 financial institutions make a simultaneous decision on their competitive location. Given those locations, at period 2, institutions compete in prices, that is, they simultaneously set deposit and loan rates in the market.

The maximization problem of banks is solved by backward induction: given a location, prices in both markets are set to maximize profits. Once the optimum values are known, the location is set to maximize profits given those optimum prices.

2.2 Equilibrium without Non-Profit Behaviour

As a benchmark case, it is useful to analyse the case of banks when there is no CSR behaviour, that is \( P = 0 \), or when consumers do not value this behaviour, \( P \) could be greater than 0 but \( \theta_i = 0 \) for all \( i \). The main results are the following:

- Both banks locate in the extremes of the line. Savings bank with \( a = 0 \) and commercial Bank with \( b = 0 \). They opt for the maximum differentiation.
- Loan and deposit rates are the same for both banks.
- Market shares are also the same, so 1/2 for each.
- Profits are also the same if there is no CSR behaviour, \( P = 0 \).
- If \( P \) was greater than 0 and consumers did not pay attention to this behaviour, savings banks would have lower profits than commercial banks due to this CSR investment.

3. Equilibrium with CSR Behaviour and Consumer Sensitivity

In the basic model, competitive variables in the absence of CSR behaviour or if consumers do not value it, are mainly the same for both types of banks. These results may change when consumers value these CSR activities. We assume that individuals have private benefits from them, therefore, they may be willing to travel further to be a customer of a savings bank. These private benefits compensate the higher transportation costs.

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7 These results derive from Hotelling (1929) as they are presented in Tirole (1988).
To calculate demand for each bank, we need to identify the consumer that is indifferent between going to any of the two financial institutions. Given point $a$, that is the distance between point 0 and savings bank’s location, and $b$, the distance between point 1 and commercial bank’s location, the indifferent consumer for deposit and loan market is respectively:

$$r_1^L L - \theta P + \alpha (x_L - a)^2 = r_2^L L + \alpha (1 - b - x_L)^2$$
$$\beta (x_D - a)^2 - r_1^D - \theta P = \beta (1 - b - x_D)^2 - r_2^D$$

The main change of these two equations with respect to the previous model is that consumers value the CSR behaviour of savings institutions and take it into account when deciding which bank they choose (left part). Commercial banks on the contrary do not have this feature and therefore the variables considered by individuals in making their decision is equal to the basic model (right part). From these equations credit and deposit demand for each bank can be calculated:

$$D_1^L = x = a + \frac{1 - a - b}{2} + \frac{L (r_2^L - r_1^L)}{2 \alpha (1 - a - b)} + \theta P$$
$$D_2^L = 1 - x = b + \frac{1 - a - b}{2} + \frac{L (r_1^L - r_2^L)}{2 \alpha (1 - a - b)} - \theta P$$
$$D_1^D = x_D = a + \frac{1 - a - b}{2} + \frac{r_1^D - r_2^D + \theta P}{2 \beta (1 - a - b)}$$
$$D_2^D = 1 - x = b + \frac{1 - a - b}{2} + \frac{r_2^D - r_1^D - \theta P}{2 \beta (1 - a - b)}$$

Although commercial banks do not have this CSR component, its existence for savings banks affects credit and deposit demand of both institutions. These demands are the same as the ones in the basic model but for the presence of the private benefits of consumers. With these demand functions and given locations $a$ and $b$, the maximization problem that each kind of bank faces to determine the optimum prices is given by:
From the first order conditions we have two systems of equations for each market whose unique solution for each rate is:

\[
\begin{align*}
    r_1^L &= r + \frac{1}{L} \left( \alpha(1-a-b) \left( 1 + \frac{a-b}{3} \right) + \frac{\theta P}{3} \right) \\
    r_2^L &= r + \frac{1}{L} \left( \alpha(1-a-b) \left( 1 + \frac{b-a}{3} \right) - \frac{\theta P}{3} \right) \\
    r_1^D &= r - \beta(1-a-b) \left( 1 + \frac{a-b}{3} \right) - \frac{\theta P}{3} \\
    r_2^D &= r - \beta(1-a-b) \left( 1 + \frac{b-a}{3} \right) + \frac{\theta P}{3}
\end{align*}
\]

Again, consumers’ sensitivity affects both savings and commercial banks in their optimal pricing behaviour. Once the optimum prices, given demand for each market, are known, the maximization problem to determine the optimum location for both kinds of bank can be written as:

\[
\begin{align*}
    \text{Savings: } & \quad \max_{r_1^D, r_1^L, a} \pi_1 = D_1^L \left( r_1^L - r \right) L - D_1^D \left( r - r_1^D \right) - F - P \\
    \text{Commercial: } & \quad \max_{r_2^D, r_2^L, b} \pi_2 = D_2^L \left( r_2^L - r \right) L - D_2^D \left( r - r_2^D \right) - F
\end{align*}
\]

Attending to the above equations and the solution to this last problem some results can be obtained relating location, rates on deposit and credit market, demand and profits for each kind of institution.

**Proposition 1:** In the presence of non-profit behaviour positively valued by consumers,

- The optimum location for commercial banks is \( b = 0 \)
- The optimum location of savings banks depends on the relationship between transportation cost, both for credit and deposit market, and the private benefit of being a customer of a bank with CSR behaviour.
Proof. See annex.

CSR behaviour of savings banks does not affect the competitive location of commercial banks. Their decision is the same as in the case of no CSR behaviour. However, savings banks change their decision when consumer values CSR activities. Their final location is dependant on the relationship between the cost of going to the bank and the private benefit for consumers that become customers of these institutions. Therefore, the competitive location of savings banks may change under some conditions on the related parameters with the introduction of the sensibility of consumers to these CSR activities. Having these locations in mind it is useful to know if the rest of the competitive parameters can be affected.

**Proposition 2**: In the presence of CSR behaviour positively valued by consumers, the loan rate and deposit rate of savings banks is respectively bigger and smaller than commercial banks’. Therefore their intermediation margin is greater.

Proof. See annex.

Savings banks make good use of the valuation of CSR behaviour by consumers and are able to charge a higher rate on their loans and pay a lower rate on their deposits than commercial banks do. This better intermediation margin helps them recover part of the investment in CSR practices. This result is independent of the final location of savings banks. Given this difference in the rates offered to customers it is interesting to know the effect on final demand of each bank both for loans and deposits.

**Proposition 3**: In the presence of CSR behaviour positively valued by consumers, demand for savings banks, both in the deposit and loan market, is greater than commercial banks’.

Proof. See annex.

The valuation of CSR practices by consumers allow savings banks not only to offer higher loan rates and lower deposit rates in the market but also to have a bigger demand than commercial banks. This greater market share result is independent of the
final location of savings banks. These theoretical results suggest that CSR investments of savings banks can help in explaining their gain in market share.

**Proposition 4:** In the presence of CSR behaviour positively valued by consumers, the comparison of profits of savings and commercial banks depends on the relationship between the earnings from deposit and loan intermediation, that are higher for savings banks, and the cost the CSR activities of the former.

**Proof.** See annex.

Profits for savings banks would be greater than that for commercial banks if earnings from loan and credit market, that derive from propositions 2 and 3, were sufficiently high to cover the costs of CSR activities. The final sign of this result clearly depends on the relationship between the cost of going to the bank and the private benefit for consumers that become customers of savings institutions and the cost of this CSR behaviour.

4. **Empirical analysis**

4.1 **Data and methodology**

Spanish banking system is an interesting setting to test the implications of the model and to analyse the relevance of CSR policies in consumers’ decisions. In particular, we collect data on mortgage loans. We consider this market the most appropriate because there are no relevant differences between the mortgage loans offered by banks and savings banks, therefore commercial and savings banks’ products are substitutes. Data are collected from the Bank of Spain and the National Statistical Office (INE). Together with mortgage data, CSR information is collected. The period of analysis is 1999-2004. This is the period in which we have data on both CSR practices by savings banks and mortgages granted. In particular, there is information about cultural and educational activities: sponsorship of conferences, expositions or museums, grants fellowship programs and the like. Activities related to health (financing new facilities to elderly people), research and development and leisure. Heritage and environment are also part of this CSR investments. This information is collected from each savings bank and CECA annual report and it is available for savings bank level.
Following the model, the features of the banking system introduced are the number of branch offices and employees to account for the serviced paid to clients as well as interest rate\textsuperscript{8}. The capacity and proximity of the different credit institutions is considered relevant to take a mortgage decision. Furthermore, as mortgage products are close substitutes, price is one of the main variables of the competition between savings and commercial banks. Traditionally savings banks were oriented to small clients and commercial banks to larger clients and firms. Although empirical papers show that this different orientation has disappeared and that both institutions compete in equal terms, Coello (1994), per capita income is also included in the estimation as economic level could affect the credit decision as well. All this data is available for province level.

The dependent variable, mortgages, and the variables on banking system, interest rate, branches and employees are introduced as the difference between commercial and savings banks. Since CSR information is available for individual savings banks, a weighted average is constructed taking into account the population attended by each savings bank\textsuperscript{9} and the province population.

Table 3 presents variable definitions and computations and table 4 reports summary statistics. A first analysis of data brings about some interesting evidence. First, savings banks’ interest rates are higher than commercial banks’. Secondly, savings banks present a higher number of branch offices per province, but with a lower number of employees. Therefore, the services to consumers by savings banks are managed through a more extensive branch network and not with larger branch agencies. From the information available about social activities, it can be observed that culture and education is the first segment in per capita investment that more than doubles investment in health activities which is the second item in relevance. Leisure activities and heritage and environment account around 15% of obra social and research and development is the item that receives the least amount of total social investment. Table 5 presents variable correlations.

\textsuperscript{8} Since nominal interest rate per province is not available, real interest rate is used.
\textsuperscript{9} For calculating the total population attended by savings banks, we take into account the population of those provinces where savings banks invest in social activities. Although after the deregulation process, savings banks have expanded the branch network nationwide, their presence is still concentrated in its original territory, where they are required to make social investments. It was not until 2004 that savings banks are required to invest in all the territories where they have branches.
Taking into account our model and data availability, the empirical equation to estimate is:

\[
\text{Mortgage}_{it} = \beta_0 + \beta_1 \text{Interest rate}_{it} + \beta_2 \text{Branches}_{it} + \beta_3 \text{Employees}_{it} + \beta_4 \text{CSR activities}_{it} + \beta_5 \text{GDP per capita}_{it} + v_{it}
\]

Where \(i\) indicates that the variable refers to the \(i\)-th province.

This equation has been estimated by panel data methodology. Unlike cross-sectional analysis, panel data methodology has a great advantage, since it allows to control for individual heterogeneity and, consequently, to eliminate the risk of obtaining biased results. Besides heterogeneity, endogeneity of explanatory variables may also affect results. In fact, interest rates and branches network are endogenous according to the model. Moreover, it is hard to assume the strict exogeneity of the employee variable. In order to control for the endogeneity of all the explanatory variables, GMM methodology has been applied. In particular, the so-called “system” GMM with the Windmeijer (2000) correction. This estimator combines the moment conditions of the model in first-differences with those of the model in levels. The Windmeijer correction avoids downward sample bias and assures that two-step GMM estimator is more efficient. To check for potential misspecification of the model the Hansen statistic of over-identifying restrictions, which tests for the absence of correlation between the instruments and the error term is reported. The AR(1) and AR(2) tests to check the hypothesis of absence of serial correlation are also presented.

4.2 Results

Results are collected in table 6. Column 1 reports the results for the total amount of CSR practices. The difference in the real interest rate affects significantly the distribution of the amount of mortgages granted by commercial and savings banks. Therefore, demand on mortgages from savings and commercial banks would be elastic to its price, the interest rate. The effect of the size of commercial network (number of branches) and the number of employees proxy the service level of banks. The effect of commercial network is not significant. On the contrary, the number of employees has a positive and significant sign. The greater the difference between the number of employees of savings banks and those of commercial banks’ the greater the amount of
mortgages granted by savings banks relative to commercial banks’. This result is part of
the conclusions of the model. We claimed that other characteristics different from the
credit price could be behind the better results of savings banks. The closeness to
customer (more employees) is among these features.

Per capita income is not statistically significant. On the contrary, social
activities of savings banks play a positive and significant role in the amount of
mortgages granted with respect to commercial banks. The greater the amount dedicated
to these activities the greater the difference in favour of savings banks. This feature, that
has to do with the social commitment and responsibility of savings banks helps to
explain the difference in market share with respect to commercial banks. Therefore,
consumers take into account the price of the loan but at the same time they consider CSR
practices. This result was in some way predicted by the model. Although savings banks
charge a greater interest rate, they end up with a greater market share reducing the
importance of price in consumer decision making.

In columns 2-7, we repeat the analysis for the different features of social
activities performed by savings banks. We distinguish among those related to health,
culture and education, research and development, leisure, heritage and environment.
Conclusions generally maintain for all variables that were analysed in column 1. The
breaking up of social activities shows interesting results. Consumers value preferably
activities that have to do with health, culture and education, leisure and environment. In
a sense, this kind of interventions could be considered as more related both to individual
benefits and to more basic needs. A consumer can have better access to medical care or
enjoy a grant to finance her studies. Therefore, customers prefer expenses that mean
more private benefits and that are related to their current needs. In fact, the significant
coefficient of environment reflects the growing interest of consumers evidenced in
increasing activism through NGO and recent public surveys, (CECA, 2004). On the
other hand, heritage and R+D activities have no effect on the decision to take a loan with
a savings or a commercial bank. Although, the coefficient is positive, meaning that
consumers value these activities, they have no statistical significance on their decision.
Heritage interventions could be considered as more general and in some cases far away
from the basic interests and needs of consumers.
Therefore, as said above, consumers take into account other features different from the price to make a decision on having their mortgage with a savings bank. These features can be identified as a closer service level and the social intervention of these institutions. However, within the social contribution, customers value more the activities that could have a direct impact on their well-being (health, culture and education, leisure and environment) than others that could be viewed as more general and not so close to them. These results help to explain the recent and increasing interest of commercial banks in creating social foundations.

7. Conclusions

The situation of Spanish banking sector is the empirical motivation of the paper. Spanish commercial banks compete with savings banks, but they differ in their objective function. Savings banks have a wider objective function derived from their particular origins consisting of social programs and commitment with the territory where they operate. The question we tackle is whether the specific objective function of savings banks may affect banking market competition. Savings banks have attracted much attention in the literature, but as far as we know, the formalisation of the consumer perception of CSR practices has not been introduced.

The results of the paper show that the introduction of this positive valuation by customers affects the competition between both banking institutions with respect to the rates charged in the loan market, interests paid in the deposit market, market shares, competitive location and profits. In particular, savings institutions are able to charge greater rates on loans offered to customers, pay lower interest rates on deposits and enjoy a greater market share than commercial banks do in both markets. The effects on competitive location of savings banks depend on the relationship between the costs of going to the bank (to get a loan or have a deposit) and the private benefit from CSR activities for consumers that become customers of these institutions. As far as profits is concerned, commercial banks would have greater profits whenever the cost of CSR activities overcomes the extra earnings obtained in the market interaction.

The empirical analysis confirms the conclusions from the theoretical model. It is shown that consumers take into account other features different from the price to make a decision on having their mortgage with a savings bank. These features can be
summarised as a closer service level, related to the number of employees, and the social
intervention of these institutions. In a more disaggregated analysis of the CSR
contribution, we find that customers value more those activities that could have a direct
impact on their wellbeing (health, culture and education, leisure and environment) than
others that could be viewed as more general and not so close to them (Heritage and
R+D). These conclusions are of interest in the debate about a firm’s social or ethical
activities. It is shown that if consumers value CSR activities, firms may improve their
results by behaving socially responsible.

Annex

Proposition 1

We use the envelope theorem to obtain the first order condition of the optimum location
for each bank.

Commercial Bank:

\[
\text{Max}_b \pi_z \left( r_2^{b*}, r_2^*, b \right) = D_z \left( r_2^* - r \right) L + D_z^P \left( r - r_2^{b*} \right) - F
\]

\[
\frac{\partial \pi_z \left( r_2^{b*}, r_2^*, b \right)}{\partial b} = \left( r_2^* - r \right) L \left( \frac{\partial D_z^L}{\partial b} + \frac{\partial D_z^L}{\partial r_2^*} \frac{dr_2^*}{db} \right) + \left( r - r_2^{b*} \right) \left( \frac{\partial D_z^P}{\partial b} + \frac{\partial D_z^P}{\partial r_2^{b*}} \frac{dr_2^{b*}}{db} \right) = 0
\]

The difference between \( r \) and each interest rate is positive, then the above expression is
negative. This means that commercial banks want to go as further as possible to the
right, therefore they will be at \( b = 0 \).

Savings Bank:

\[
\text{Max}_a \pi_1 \left( r_1^{a*}, r_1^*, a \right) = D_1 \left( r_1^* - r \right) L + D_1^P \left( r - r_1^{a*} \right) - F - P
\]

\[
\frac{\partial \pi_1 \left( r_1^{a*}, r_1^*, a \right)}{\partial a} = \left( r_1^* - r \right) L \left( \frac{\partial D_1^L}{\partial a} + \frac{\partial D_1^L}{\partial r_1^*} \frac{dr_1^*}{da} \right) + \left( r - r_1^{a*} \right) \left( \frac{\partial D_1^P}{\partial a} + \frac{\partial D_1^P}{\partial r_1^{a*}} \frac{dr_1^{a*}}{da} \right) = 0
\]

The difference between \( r \) and each interest rate is positive, then the above expression is
negative. This means that commercial banks want to go as further as possible to the
right, therefore they will be at \( a = 0 \).
Given that \( b = 0 \), optimum location of savings banks depend on the relationship between the private benefit for consumers of the CSR activity and the costs of going to a bank to get a loan or have a deposit.

**Proposition 2**

Loan rate, we want to prove that \( r_1^L - r_2^L > 0 \),

\[
r_1^L - r_2^L = r + \frac{1}{L} \left( \alpha(1-a-b) \left(1+\frac{a-b}{3}\right) + \frac{\theta P}{3} \right) - \left( r + \frac{1}{L} \left( \alpha(1-a-b) \left(1+\frac{b-a}{3}\right) - \frac{\theta P}{3} \right) \right) = \]

\[
= \frac{1}{L} \left( 2\alpha(1-a-b) \left(\frac{a-b}{3}\right) + \frac{2}{3} \frac{\theta P}{3} \right)
\]

This expression is positive since \( b = 0 \) and \( a \) is non-negative.

Deposit rate, we want to prove that \( r_1^D - r_2^D < 0 \),

\[
r_1^D - r_2^D = r - \beta(1-a-b) \left(1+\frac{a-b}{3}\right) - \frac{\theta P}{3} - \left( r - \beta(1-a-b) \left(1+\frac{b-a}{3}\right) + \frac{\theta P}{3} \right) = \]

\[
= 2\beta(1-a-b) \left(\frac{b-a}{3}\right) - \frac{2}{3} \frac{\theta P}{3}
\]

This expression is negative since \( b = 0 \) and \( a \) is non-negative.

Therefore the intermediation margin is greater.

**Proposition 3**

Demand for loans, we want to prove that \( D_1^L - D_2^L > 0 \)

\[
D_1^L - D_2^L = a + \frac{1-a-b}{2} + \frac{b-a}{3} + \frac{\theta P}{6\alpha(1-a-b)} - \left( b + \frac{1-a-b}{2} + \frac{a-b}{3} - \frac{\theta P}{6\alpha(1-a-b)} \right) = \]

\[
= a - b + \frac{2}{3} (b - a) + \frac{2\theta P}{6\alpha(1-a-b)} = \frac{1}{3} (a - b) + \frac{2\theta P}{6\alpha(1-a-b)}
\]

This expression is positive since \( b = 0 \) and \( a \) is non-negative.

Demand for deposits, we want to prove that \( D_1^D - D_2^D > 0 \)
\[ D_1^p - D_2^p = a + \frac{1 - a - b}{2} + \frac{b - a}{3} + \frac{\theta P}{6\alpha(1 - a - b)} - \left( b + \frac{1 - a - b}{2} + \frac{a - b}{3} - \frac{\theta P}{6\alpha(1 - a - b)} \right) \]

\[ = a - b + \frac{2}{3} (b - a) + \frac{2\theta P}{6\alpha(1 - a - b)} = \frac{1}{3} (a - b) + \frac{2\theta P}{6\alpha(1 - a - b)} \]

This expression is positive since \( b = 0 \) and \( a \) is non-negative.

**Proposition 4**

To prove proposition 4 simply note that with a greater intermediation margin and a greater demand the profit from market activity is higher for savings banks. The sign of the overall profit will clearly depend on the relationship between this greater market profit and the amount of the CSR activities.
References


Cespa, G. y G. Cestone. 2002. “Stakeholder activism, managerial entrenchment, and the congruent of interest between shareholders and stakeholders”, UPF WP.


RSC Europe. 2003. Equipping Europe for RSC and sustainable development, Brussels, RSC.


Sánchez, J. M. and M. Sastre de Miguel. 1994. ¿Es el tamaño un factor explicativo de las diferencias entre entidades bancarias?, Banco de España, Documento de trabajo N 9512.


Table 1: Financial Data. 1990-1999 average

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Table 2: Savings Bank Profit distribution (percentage)

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Table 3: Main Variables

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<td>Bank of Spain</td>
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Table 4: Summary Statistics

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### Table 5: Correlations

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* Significant at 5% level.

### Table 6: Empirical evidence: main results

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***, **, * significant at 1%, 5% and 10% respectively.