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 that invest in social activities. Banking literature about competition is fairly large, but the strategic interaction between profit maximizing and non profit maximizers has not been extensively analysed except for Purroy and Salas (1999). In this paper, a completely different approach is taken. An adaptation of Hotelling's two stage model of spatial competition is developed 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 deposit or mortgage decision. These conclusions are of interest in the debate about a firm's social or ethical activities. It is shown that if consumers value social activities, firms can improve their results by behaving socially responsible.

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

JEL classification: D83, G21, D21.

1. Introduction

The Spanish banking sector is a regulated industry where three kinds of institutions, commercial banks, savings banks and credit cooperatives compete under equal conditions in the loan, deposit and financial services market. The two main financial institutions: commercial banks and savings banks, which account for 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[1]. Therefore, savings banks can be considered as *"non-profit"* organizations in the sense of Hansmann (1996) with a social contribution (Crespí 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 for, nowadays, around 20% of their net profits 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. One would have expected a reduction in this quantity as solvency has been encouraged by financial authorities in the last decade. However, it can be observed 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). 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[2].

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[1] Around a fifth part 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.

[2] Commercial banks are becoming to be aware of the public recognition of corporate social responsibility. Some of them have created foundations to attend social demands but they are in their initial stage.

	Commercial Banks	Savings Banks
Operating costs/assets	2.15	2.66
Staff costs/assets	1.32	1.61
Staff costs/operating costs	61.65	60.49
Financial income/assets	7.62	8.05
Intermediation margin/assets	2.26	3.44
Ordinary margin/assets	3.14	4.19
Operating margin/assets	1.01	1.55
ROA	0.53	1.10
ROE	11.49	18.77

Table 1A: Financial Data. 1990-1999 average.
Source: Valero (2003)

	Avg 1992-2002	2003	2004
Deposits Commercial Banks	42.74	37.10	35.62
Deposits Savings Banks	50.77	55.19	56.60
Credit Commercial Banks	55.60	47.87	47.17
Credit Savings Banks	40.06	46.69	47.38
Solvency Commercial Banks	0.94	0.59	0.61
Solvency Savings Banks	0.84	0.52	0.49

Table 1B: Market Share and Solvency
Source: CECA

Year	Taxes	Reserves	Social Contribution (obra social)
1990	28.78	48.43	22.09
1991	24.60	54.63	18.98
1992	23.77	58.02	17.78
1993	24.85	54.57	20.40
1994	22.64	58.57	18.63
1995	24.20	57.12	18.54
1996	24.44	55.98	19.46
1997	23.58	56.69	19.64
1998	22.44	57.02	20.46
1999	22.37	57.61	19.94

Table 2: Savings Bank Profit distribution (percentage)
Source: Valero (2003)

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 Gómez (2001) and Fuentelsaz et al (2002) analyse the entry effects of branch deregulation. This work, instead, focus on the analysis of CSR activities and their effects on performance and profitability. To do so, a Hotelling set up[3] (1929) is used to analyse the competitive game between commercial and savings banks when consumers recognise and value the social activities carried out by the latter.

The contribution of the analysis is threefold. First, unlike previous papers that have concentrated on deposits, it attempts to integrate both loans and deposits in the theoretical and empirical analysis. Second, as far as the authors are concerned, it is the first time that savings banks' social activities are introduced explicitly in the analysis. Third, the significance of CSR activities in the financial sector is evaluated. 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, hence the results about CSR may be biased or simply driven by the different features of products. Spanish banking sector and particularly the deposits and mortgage market is a very appropriate framework to overcome these weaknesses. Deposits and Mortgages are quite homogeneous products that are 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[4].

The paper is organized as follows, section two deals with the model, and 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.

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[3] Matutes and Vives (1995) also apply this setting to banking industry, although they only include depositors.

[4] Corporate governance issues are not included.

2. Basic Model

2.1. Structure of the Economy

A Hotelling set up (1929) is considered, that is, it is assumed 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[5]. Each consumer has one unit of cash, which 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[6]. 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 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 the model it is assumed that consumers positively value these CSR activities of savings banks. Besides this positive valuation by consumers, a parameter, P, will stand for the size or amount of these activities.

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

$$U = (1 + r_D) - \alpha x_D^2 - (1 + r_L)L - \beta x_L^2 + \theta P \tag{1}$$

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), α (resp. β) is the transportation cost parameter for deposits (resp. loans), L is the inelastic credit demand (it is assumed that L < 1). Finally, as said above, θ 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[7]. The objective function of each is:

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[5] For a thorough analysis see Freixas and Tirole (1998).
[6] Deposit and credit markets are considered as separate markets.
[7] Therefore θ 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 behaviour it takes time for

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

Commercial: $\pi_2 = D_2^D\left(r - r_2^D\right) + D_2^L L\left(r_2^L - r\right) - F$ $\qquad\qquad$ (2)

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 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 $\theta = 0$. The main results are the following[8]:

- 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 the CSR activities developed by savings banks. It is

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consumer to recognise and value this behaviour. Besides, the amount of the contributions made by the two biggest commercial banks in 2004 is lower than 10% of savings banks'.

[8] These results derive from Hotelling (1929) as they are presented in Tirole (1988).

assumed 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 might compensate the higher transportation costs[9].

To calculate demand for each bank, the identification of the consumer that is indifferent between going to any of the two financial institutions is needed. 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:

$$r_1^L L - \theta P + \alpha(x_L - a)^2 = r_2^L L + \alpha(1 - b - x_L)^2$$
$$\beta(x_D - a)^2 - r_1^D - \theta P = \beta(1 - b - x_D)^2 - r_2^D \qquad (3)$$

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:

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

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

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

$$D_2^D = 1 - x = b + \frac{1 - a - b}{2} + \frac{r_2^D - r_1^D - \theta P}{2\beta(1 - a - b)} \qquad (4)$$

The existence of the CSR component affects not only savings banks but the 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:

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[9] The model can be easily generalized to include RSC activities of commercial banks. In this case there would be a positive sensitivity for commercial banks and P>0. If this was the case the results of the model would hold assuming that the private benefits from being a customer of a commercial bank are lower than savings' banks. This is a reasonable assumption since commercial banks are now starting to have these RSC activities and the amount invested is still very low compared with that of savings banks (see footnote 8)

Savings: $\underset{r_1^D, r_1^L}{Max}$ $\quad \pi_1 = D_1^L\left(r_1^L - r\right)L - D_1^D\left(r - r_1^D\right) - F - P$

Commercial: $\underset{r_2^D, r_2^L}{Max}$ $\quad \pi_2 = D_2^L\left(r_2^L - r\right)L - D_2^D\left(r - r_2^D\right) - F$ $\qquad\qquad$ (5)

From the first order conditions there are two systems of equations for each market whose unique solution for each rate is:

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

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

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

$$r_2^D = r - \beta(1 - a - b)\left(1 + \frac{b - a}{3}\right) + \frac{\theta P}{3} \qquad\qquad (6)$$

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:

Savings: $\underset{a}{Max}$ $\quad \pi_1\left(r_1^{D^*}, r_1^{L^*}, a\right) = D_1^L\left(r_1^{L^*} - r\right)L - D_1^D\left(r - r_1^{D^*}\right) - F - P$

Commercial: $\underset{b}{Max}$ $\quad \pi_2\left(r_2^{D^*}, r_2^{L^*}, b\right) = D_2^L\left(r_2^{L^*} - r\right)L - D_2^D\left(r - r_2^{D^*}\right) - F$ $\qquad$ (7)

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 appendix.

CSR behaviour of savings banks does not affect the competitive location of commercial banks. Their decision is the same as in the case of not having these practices or if consumers do not value them. 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 of becoming a customer of these institutions. Therefore, with the introduction of the sensibility of consumers to these CSR activities, the competitive location of savings banks could change under some conditions on the related parameters. Having these locations in mind it is useful to know if the rest of the competitive results 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 appendix.

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 appendix.

The valuation of CSR practices by consumers allows 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 also 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 in the Spanish financial markets in the last years. The effects on performance are treated in the following proposition.

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 appendix.

Profits for savings banks would be greater than that of 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, 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, data on mortgage loans and deposits is collected. These markets are considered very appropriate because there are no relevant differences between the mortgage loans and deposits offered by banks and savings banks. Therefore, as commercial and savings banks' products are close substitutes we are able to test the relevance of CSR policies on consumer decisions. Data are collected from the Bank of Spain, the National Statistical Office (INE) and the Spanish Federation of Savings Banks (CECA). The period of analysis is 1999-2004. This is the period in which data is available on CSR practices by savings banks and on deposits and mortgages granted by both institutions. In the case of CSR, disaggregated information by types of interventions can be also obtained. In particular, about cultural activities: sponsorship of conferences, expositions or museums and the like. Activities related to health (financing new facilities to elderly people), education and research and development, through grant fellowship programs, and leisure. Heritage and environment are also part of these CSR investments.

Following the model, some features of the banking system are introduced. First, the number of branch offices and the number of employees. These variables reflect the fact that the capacity and proximity of the different credit institutions is considered relevant to make a mortgage or deposit decision and are a proxy of the service paid to clients. Second, the interest rate[10]. Since products offered by commercial and savings banks 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. However, 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 and deposit decision as well. All this data is available for province level.

The dependent variable, mortgages or deposits, 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 province average of both the amount invested and the number of interventions is constructed taking into account the population attended by

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[10] Since nominal interest rate per province is not available, a calculation of the real interest rate is used.

each savings bank[11] 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 of mortgages and deposits are respectively higher and lower 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 with smaller agencies. From the information available about social activities, it can be observed that culture is the first segment in investment, 50% more than the investment in health activities which is the second item in relevance. Leisure activities and heritage and environment account around 15% of *obra social*. Table 5 presents variable correlations.

Taking into account the model and data availability, the empirical equations to estimate are:

$$Mortgage_{it} = \beta_0 + \beta_1\ Interest\ rate_{it} + \beta_2 Branches_{it} + \beta_3\ Employees_{it} + \beta_4 CSR\ activities_{it} + \beta_5 GDPpercap_{it} + v_{it}$$

$$Deposits_{it} = \beta_0 + \beta_1\ Interest\ rate_{it} + \beta_2 Branches_{it} + \beta_3\ Employees_{it} + \beta_4 CSR\ activities_{it} + \beta_5 GDPpercap_{it} + v_{it} \tag{8}$$

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. Individual effects can be considered fixed or random. The fixed effects model is simply analyzed conditionally on the effects present in the observed sample, but there is no reason to consider individual effects as uncorrelated with the other regressors, as it is assumed in the random effects model. The random effects treatment, therefore, may suffer from the inconsistency due to omitted variables. *Hausman test* tests the hypothesis that the random effect estimator is consistent, because individual effects are correlated with the explicative variables. When correlation is present, conditional inference must be done (fixed effect estimation) [Arellano y Bover, 1990]. 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 CSR variable. A possible solution is to use instrumental variable estimation (IV) introducing lagged values of endogenous variables as instruments. Another solution is to control for the potential endogeneity of all the explanatory variables through the GMM methodology. This

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[11] 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 their 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.

strategy consists of obtaining additional instruments using the orthogonality conditions that exist between lagged values of the right-hand side variables.

Variable	Definition	Source
Difdepos	Difference in deposits amount between savings and commercial banks, euro billions	Bank of Spain
DifMor	Difference in mortgage amount granted by savings and commercial banks, euro billions.	INE and own computations
Difdeptireal	Difference in the real interest rate paid on deposits by commercial and savings banks. Basis points	Bank of Spain and own computations
Difmortireal	Difference in the real interest rate charged by commercial and savings banks. Basis points	Bank of Spain and own computations
Difbranch	Difference in number of branch offices per province between commercial and savings banks	Bank of Spain
Diffempl	Difference in number of employees per province between commercial and savings banks	Bank of Spain and own computations
Income	Per capita income per province, euro thousands	INE
PopCSR	Amount of funds allocated to social activities per province, euro millions	CECA and own computations
PopnCSRl	Number of activities of *obra social* per province	CECA and own computations
Popcult	Amount of funds allocated to cultural activities per province, euro millions	CECA and own computations
Popleisure	Amount of funds allocated to leisure activities per province, euro millions	CECA and own computations
Pophealth	Amount of funds allocated to health activities per province, euro millions	CECA and own computations
Popedurd	Amount of funds allocated to education and R+D activities per province, euro millions	CECA and own computations
Popheritenviron	Amount of funds allocated to heritage and environment activities per province, euro millions	CECA and own computations

Table 3: Main Variables

Variable	Obs	Mean	Std. Dev.	Min	Max
Difdepos	300	1.3373	8.7485	-59.2819	45.4227
DifMor	300	0.2341	0.4786	-1.2834	4.3840
Difdepireal	300	-8.486	2.405	-13.52397	-3.44558
Difmorireal	300	20.69	7.36	10.87785	32.14888
Difbranch	300	101.2033	272.401	-648	2132
Diffempl	300	-229.803	1377.791	-9398.825	7329.252
Income	300	15.78514	3.7586	8.662	26.80512
PopCSR	300	20.17542	31.479	.6192216	210.9178
PopnCSR	300	24.73912	33.612	0	224.7919
Popcult	300	7.679825	12.834	.2240918	98.20525
Popleisure	300	1.648104	2.4255	0	18.9956
Pophealth	300	5.354802	10.4011	.0851	68.98449
Popedurd	300	3.799948	5.9685	.0819388	44.483
Popheritenviron	300	1.716086	3.0122	0	20.71931

Table 4: Summary Statistics

	Dfdepir	Dfmorir	Difbran	Difemp	Income	PpCSR	PnCSR
Dfdepir	1.000						
Dfmorir	0.2756*	1.000					
Dfbran	0.0315	-0.0547	1.000				
Difemp	0.0071	-0.0648	0.7503*	1.000			
Income	0.0448	-0.1749*	0.2051*	0.1327	1.000		
PopCSR	0.0683	-0.0280	0.6678*	0.0794	0.2675*	1.000	
PopnCSR	-0.0206	0.0025	0.6638*	0.3344*	0.2715*	0.7037*	1.000

Table 5: Correlations
Significant at 5% level.

In the estimation of the model, the results of all methods above explained are presented. First, all variables are considered strictly exogenous, second, IV estimation is implemented[12] and finally, GMM estimation is reported. Following Arellano and Bond (1991), all the right-hand side variables in the model lagged twice or more are used as instruments. In this case, to check for potential misspecification of the model the Sargan statistic of over-identifying restrictions, which tests for the absence of correlation between the instruments and the error term is reported. Furthermore, the AR(1) and AR(2) tests, that check the hypothesis of absence of serial correlation, are also presented.

4.2. Results

Results are collected in table 6: 6A for deposits and 6B for mortgages. The first three columns report the results for the total amount of CSR practices and the last three for the number of CSR interventions with the three different estimation techniques.

In the case of deposits, the difference in real interest rate does not affect the distribution between commercial and savings banks. Therefore, demand on deposits from savings and commercial banks would be inelastic 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. Commercial network's coefficient is significant and negative whereas the number of employees has a positive and significant sign in two of the three models. Therefore, the greater the difference between the number of employees of savings banks and those of commercial banks' and the lower the number of branches, the greater the amount of deposits of savings banks relative to commercial banks'. This result could support the strategy of reducing commercial network followed by commercial banks. However these relationships have to be taken cautiously. The sign of coefficients changes when GMM estimation is used and they are not significant, more in line with the strategy of greater commercial network followed by savings banks.

Per capita income is not statistically significant. On the contrary, the amount of *obra social* of savings banks plays a positive and significant role in the amount of deposits of savings banks with respect to commercial banks. The greater the amount dedicated to these investments the greater the difference in favour of savings banks (columns 1 to 3). 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. This is not the case if the number of interventions is considered (columns 4 to 6). In the deposit market, consumers value the amount invested in these activities but do not care about how, number of activities, these interventions are carried out. Therefore, consumers take into account the amount invested in CSR practices to make a decision on where to have their deposits.

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[12] In particular, lagged values t-1 and t-2 are introduced as instruments for the interest rate, number of branches and CSR policies.

	(1)	(2)	(3)	(4)	(5)	(6)
	Panel	**IV**	**GMM**	**panel**	**IV**	**GMM**
	difdep	**Difdep**	**difdep**	**difdep**	**difdep**	**difdep**
Income	0.02625	-0.0329	-0.1036	0.00167	0.1004	0.0018
	[0.06053]	[0.0957]	[0.2045]	[0.0573]	[0.0923]	[0.1040]
difdepireal	-1.9423	-0.9848	0.6057	0.0613	0.2976	0.7178
	[1.4260]	[1.2628]	[1.0313]	[0.1411]	[0.6386]	[0.9697]
Difbranch	-0.3642**	-1.058***	0.1604	-0.678***	-0.5460*	0.4814
	[0.0553]	[0.2257]	[0.4405]	[0.1192]	[0.3021]	[0.4901]
Difempl	0.0578***	0.1519***	-0.0240	0.1175***	0.0975**	-0.0381
	[0.0087]	[0.0280]	[0.0651]	[0.0213]	[0.0490]	[0.0555]
PopCSR	0.1255***	0.3937***	0.2388***			
	[0.0253]	[0.1018]	[0.0838]			
PopnCSR				0.0048	-0.0637	-0.0155
				[0.0108]	[0.1041]	[0.0185]
Observs.	300	250	250	300	250	250
Hausman test	4.16	2.18		17.84*	66.44***	
Sargan test		0.615	19.82		1.539	27.88
AR(1)			2.44*			1.65
AR(2)			0.02			1.31

Table 6A: Empirical evidence. Deposits

Note: Dependent variable is the difference in the quantity of deposits between savings and commercial banks. Income accounts for the per capita income. Difdepireal is the difference in real interest rate of deposits. Difbranch is the difference in number of branches. Difempl, difference in the number of employees. PopCSR and PopnCSR is the amount invested and the number of activities respectively by savings banks

Heteroskedasticity consistent asymptotic standard error in parentheses. * , **, *** indicates significance at the 1%, 5% and 10% level. AR(i) is a serial correlation test of order i using residuals in first differences, asymptotically distributed as N(0,1) under the null of no serial correlation.

In the case of mortgages (table 6B), the coefficient of the difference in real interest rate is not significant. Hence differences in interest rate do not affect significantly mortgage or deposit decisions. This result relates to proposition 2 of the model. Consumers would care less about the loan price or the return on deposits and this would not affect significantly savings bank market share (proposition 3). The effect of the size of commercial network (number of branches) and the number of employees is significant but with the opposite sign found for deposits. The effect of commercial network is positive whereas the number of employees is negative. Therefore, the greater the difference between the number of branches and the lower 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'. That is, consumers prefer to have more branches with fewer employees. This result, that supports the strategy of a greater commercial network followed by savings banks, is part of the conclusions of the

model. It was claimed that other characteristics different from the credit price could be behind the better results of savings banks. Furthermore, this result seems more robust than that obtained for deposits since it maintains with independence of the estimation method.

	(1)	(2)	(3)	(4)	(5)	(6)
	Panel Difmor	**IV difmor**	**GMM difmor**	**panel difmor**	**IV difmor**	**GMM difmor**
Income	0.0164**	0.0232**	0.0482***	0.01327*	0.0089	0.0237
	[0.0069]	[0.0117]	[0.0178]	[0.0068]	[0.0131]	[0.0163]
difmorireal	-0.1408	0.5561	-0.1449	-0.1862	0.0483	0.0957
	[0.2072]	[1.3861]	[0.5903]	[0.2047]	[1.5196]	[0.4963]
Difbranch	0.0137***	0.1273***	0.0619**	0.0116***	0.0825*	0.0719***
	[0.0038]	[0.0440]	[0.0297]	[0.0019]	[0.0476]	[0.0264]
Difemplo	-0.0005	-0.0201***	-0.0105*	-0.0004	-0.0137*	-0.0120***
	[0.0005]	[0.0074]	[0.0059]	[0.0003]	[0.0079]	[0.0044]
PopCSR	0.00069	-0.0052	-0.0004			
	[0.0021]	[0.0012]	[0.0049]			
PopnCSR				0.0029***	0.0182**	0.0073***
				[0.0010]	[0.0073]	[0.0019]
Observs.	300	250	250	300	250	250
Hausman test	12.59	13.88***		8.19	10.30**	
Sargan test		1.159	43.09		2.534	45.16
AR(1)			-1.26			-1.23
AR(2)			-0.91			-0.56

Table 6B: Empirical evidence. Mortgages

Note: Dependent variable is the difference in the quantity of mortgages granted between savings and commercial banks. Income accounts for the per capita income. Difmorireal is the difference in real interest rate of mortgages. Difbranch is the difference in number of branches. Difempl, difference in the number of employees. PopCSR and PopnCSR is the amount invested and the number of activities respectively by savings banks

Heteroskedasticity consistent asymptotic standard error in parentheses. * , **, *** indicates significance at the 1%, 5% and 10% level. AR(i) is a serial correlation test of order i using residuals in first differences, asymptotically distributed as N(0,1) under the null of no serial correlation.

Per capita income is statistically significant and positive only for some estimations. With respect to CSR, the number of activities of savings banks plays a positive and significant role in the amount of mortgages granted with respect to commercial banks. The greater is the number of interventions, the greater the difference in favour of savings banks (columns 4 to 6). This is not the case if the amount of investment is considered (columns 1 to 3). In the mortgage market then, consumers value more the number of social interventions than the global amount invested. Again, consumers take into account CSR practices to make a mortgage decision. This result,

both for deposits and mortgages, was in some way predicted by the model. Although savings banks usually charge a greater interest rate in mortgages and pay a lower interest rate in deposits (proposition 2), they end up with a greater market share (proposition 3) reducing the importance of price in consumer decision making.

A simultaneous estimation of both markets, deposits and mortgages, is presented in table 7[13]. Results confirm the relevance of social activities of savings banks in explaining the difference in market share with commercial banks. The greater the number of interventions the greater the difference in favour of savings banks both for deposits and for mortgages. The amount invested in social contributions is also positive for both markets but not significant.

	Amount		Number of Activities	
	difmor	**difdepos**	**Difmor**	**difdepos**
Pibperca	0.0168***	0.2386**	13.2402**	0.1093
	[0.0063]	[0.1068]	[6.5787]	[0.1149]
Difireal	-1.5483	1.4731	-2.1936	2.9693
	[1.2410]	[1.6599]	[1.4985]	[1.9695]
Difbranch	0.0095***	-0.1857***	0.0099***	-0.2283***
	[0.0031]	[0.0535]	[0.0027]	[0.0439]
Difempl	0.0002	0.0792***	-0.0001	0.0768***
	[0.0004]	[0.0077]	[0.0003]	[0.0048]
popCSR	0.0025	0.0439		
	[0.0018]	[0.0305]		
popnCSRl			0.0031**	0.0969***
			[0.0016]	[0.0258]
R	0.59	0.64	0.58	0.62
Observations	250	250	250	250

Table 7: Simultaneous Estimation of Deposits and Mortgages

Note: Dependent variable is the difference in the quantity of mortgages (deposits) between savings and commercial banks. Income accounts for the per capita income. Difireal is the difference in real interest rate of mortgages (deposits). Difbranch is the difference in number of branches. Difempl, difference in the number of employees. PopCSR and PopnCSR is the amount invested and the number of activities respectively by savings banks. Standard errors are in brackets.***, **, * show significant effects at 1%, 5% and 10% respectively.

Finally, in table 8, the analysis is repeated for the different features of social activities performed by savings banks[14]. It distinguishes among those related to health, culture, education and research and development, leisure, heritage and environment. In the case of deposits, the breaking up of social activities shows interesting results.

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[13] In this estimation, interest rate, branches, employees and CSR activities are considered endogenous and instrumented by lagged values.

[14] This analysis is carried out for the amount invested in social activities due to the lack of disaggregated data on the number of social interventions.

	Difdepos	Difmor
Income	0.0306	0.0466***
	[0.0472]	[0.0137]
Difempl	0.1411***	-0.0144
	[0.0338]	[0.0090]
Difireal	0.1531	0.5473
	[0.1983]	[0..4721]
Difbranch	-0.9686***	0.0773
	[0.2635]	[0.0476]
Popcult	0.4015***	0.0414*
	[0.1088]	[0.0236]
Popleisure	0.1767*	-0.0062
	[0.1062]	[0.0404]
popedurd	-0.2367***	0.0086
	[0.0872]	[0.0226]
Pophealth	0.0384	-0.0071
	[0.0315]	[0.0152]
Popheritenvir	0.4770**	-0.0239
	[0.2139]	[0.0469]
SARGAN TEST	36.67	38.76
AR(1)	-0.95	-1.38
AR(2)	-1.04	-1.48

Table 8: Items of CSR. Deposits and Mortgages. GMM estimation

Note: Dependent variable is the difference in the quantity of mortgages (deposits) between savings and commercial banks. Income accounts for the per capita income. Difireal is the difference in real interest rate of mortgages (deposits). Difbranch is the difference in number of branches. Difempl, difference in the number of employees. Popleisure, popedurd, pophealth, popheritenvir is the amount invested in leisure, education and R+D, health and heritage and environment respectively by savings banks. Heteroskedasticity consistent asymptotic standard error in parentheses. * , **, *** indicates significance at the 1%, 5% and 10% level. AR(i) is a serial correlation test of order i using residuals in first differences, asymptotically distributed as N(0,1) under the null of no serial correlation.

Consumers value preferably activities that have to do with culture, leisure, heritage and environment. In a sense, this kind of interventions could be considered both as more related to individual benefits (culture and leisure) and to more general and social needs (heritage and environment). Therefore, customers prefer expenses that, on the one hand mean more private benefits and are related to their current needs and on the other hand those that are devoted to more general objectives. 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, health 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, it has no statistical significance on their decision. Finally, education and R+D have a negative and significant sign. That is, consumers value

negatively the investments of savings banks in these activities. This result is relevant since Education and R+D is the second item that receives more investment. In the case of mortgages only cultural activities, the most important item, have a positive and significant sign even though the global amount of social contribution (table 6B, columns 1 to 3) was not significant.

Therefore, as said above, consumers take into account other features different from the price to make a decision on having their mortgage and deposits with a savings bank. These features can be identified as a closer commercial network and service level and the social intervention of these institutions. These results help to explain the recent and increasing interest of commercial banks in creating social foundations.

5. Conclusions

The characteristics and recent evolution 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 a strong commitment with the territory where they operate. The question tackled in the paper 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 the authors 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 of becoming a customer 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 and deposits with a savings bank. These features can be summarised as a closer commercial network and service level, related to the number of branches and employees, and the social intervention of these institutions. In a more disaggregated analysis of the CSR contribution, it is found that customers value equally activities that could have a direct impact on their wellbeing (culture and leisure) and others that could be viewed as more general with features of public good (heritage and environment). 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.

Appendix

<u>Proposition 1</u>
The envelope theorem is used to obtain the first order condition of the optimum location for each bank.
Commercial Bank:

$$\underset{b}{Max} \quad \pi_2\left(r_2^{D^*}, r_2^{L^*}, b\right) = D_2^L\left(r_2^{L^*} - r\right)L + D_2^D\left(r - r_2^{D^*}\right) - F$$

$$\frac{\partial \pi_2\left(r_2^{D^*}, r_2^{L^*}, b\right)}{\partial b} = \left(r_2^{L^*} - r\right)L\left(\frac{\partial D_2^L}{\partial b} + \frac{\partial D_2^L}{\partial r_1^L}\frac{dr_1^L}{db}\right) + \left(r - r_2^{D^*}\right)\left(\frac{\partial D_2^D}{\partial b} + \frac{\partial D_2^D}{\partial r_1^D}\frac{dr_1^D}{db}\right) =$$

$$= \left(r_2^{L^*} - r\right)L\frac{\alpha(1-a-b)(-1-a-3b) - \theta P}{6\alpha(1-a-b)^2} + \left(r - r_2^{D^*}\right)\frac{\beta(1-a-b)(-1-a-3b) - \theta P}{6\beta(1-a-b)^2} \qquad (9)$$

      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:

$$\underset{a}{Max} \quad \pi_1\left(r_1^{D^*}, r_1^{L^*}, a\right) = D_1^L\left(r_1^{L^*} - r\right)L + D_1^D\left(r - r_1^{D^*}\right) - F - P$$

$$\frac{\partial \pi_1\left(r_1^{D^*}, r_1^{L^*}, a\right)}{\partial a} = \left(r_1^{L^*} - r\right)L\left(\frac{\partial D_1^L}{\partial a} + \frac{\partial D_1^L}{\partial r_2^L}\frac{dr_2^L}{da}\right) + \left(r - r_1^{D^*}\right)\left(\frac{\partial D_1^D}{\partial a} + \frac{\partial D_1^D}{\partial r_2^D}\frac{dr_2^D}{da}\right) =$$

$$= \left(r_1^{L^*} - r\right)L\frac{\alpha(1-a-b)(-1-b-3a) + \theta P}{6\alpha(1-a-b)^2} + \left(r - r_1^{D^*}\right)\frac{\beta(1-a-b)(-1-b-3a) + \theta P}{6\beta(1-a-b)^2} \qquad (10)$$

      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.

<u>Proposition 2</u>
Loan rate, we want to prove that $r_1^L - r_2^L > 0$,

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

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

$$(11)$$

This expression is positive since $b = 0$ and a is non-negative.

Deposit rate, we want to prove that $r_1^D - r_2^D < 0$,

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

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

(12)

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 $D_1^L - D_2^L > 0$

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

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

(13)
This expression is positive since $b = 0$ and a is non-negative.

Demand for deposits, we want to prove that $D_1^D - D_2^D > 0$

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

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

(14)
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.

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