

**OWNERSHIP STRUCTURE AND BANKING EFFICIENCY:  
EVIDENCE FROM COSTA RICA**

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**Abstract**

This paper evaluates the efficiency of the Costa Rican banking firms, grouped according to their ownership structure. Using information for the period 1998-2004, we propose a factorial decomposition model and a regression analysis. The results do not lend to support the Property Rights Theory, since in the case of the Costa Rican banking system we cannot affirm that State owned banks are systematically less efficient than privately owned financial institutions. Through our analysis we also find that both State owned and privately owned banks seek efficiency, but they follow very different paths according to their characteristics and their specific objectives. The findings suggest that, rather than privatisation, the presence of effective monitoring mechanisms may yield to efficiency improvements.

**Keywords:** State owned vs. privately owned firms, Banking, Efficiency, Organisational.

**JEL Classification:** D23, G21, G32, L33.

# **OWNERSHIP STRUCTURE AND BANKING EFFICIENCY: EVIDENCE FROM COSTA RICA**

## **1. Introduction**

The efficiency analysis of the banking sector has recently emerged as an important research trend (Berger and Humphrey, 1997; Berger and Mester, 1997, Berger, et al., 1999, and Altunbas, et al., 2001). Despite the relevance of the banking industry, this sector in most economies has been more regulated than others. This might be due to the strategic role that an efficient financial system plays in an economy (Levine, 1997; Levine and Zervos, 1998; Rousseau and Wachtel, 1998; Rajan and Zingales, 1998; and Amable and Chatelain, 2001). Albeit the importance of privatisation and liberalisation processes in this industry, there is a pervasive presence of government and unbending excessive regulatory schemes in the banking industry around the world (La Porta et al., 2002).

There is a long-lasting debate about the efficiency of State owned and privately owned firms. Theoretical frameworks favouring private ownership are quite extensive. The Property Rights theory states that ownership structure within any kind of organisation conditions its efficiency level and it considers State owned firms to be less efficient than privately owned ones. This assumption lies on the multi-objective nature of State owned firms, fact that is incompatible with the objective of wealth maximisation, leading to lower levels of efficiency. This problem is aggravated when the government changes the firm's objectives to accommodate the interests of different pressure groups (Alchian and Demsetz, 1972; Shleifer and Vishny, 1994). Moreover, the dispersed principal in

the State owned firms widen the separation of ownership and control, leading managers to pursue their own agenda.

In the case of privately owned firms, it is assumed that managers are monitored effectively, as a result of an appropriate allocation of property rights. This gives agents both the incentives and bargaining power to decide the firm's best course of action (Grossman and Hart, 1986; Hart and Moore, 1990). Nevertheless, Grossman and Hart (1980) show that effective monitoring mechanisms over managers that are not maximising profits, may fail due to the presence of a principal scattered (free rider problem).

The body of empirical research relating efficiency and ownership is inconclusive. For cross section comparative efficiency, Boardman and Vining (1989) and Dewenter and Malatesta (2001) report that State owned enterprises are less efficient than privately owned firms. Conversely, Caves and Christensen (1980), and Hjalmarsson and Veiderpass (1992) concluded that ownership is not a factor that explains efficiency differences.

Concerning the banking sector, most of the literature is focussed on comparing the usual dichotomy between State owned and privately owned firms. Empirical findings show that saving & loans (Mester, 1993) and state owned banks (Bhattacharyya et al., 1997) operate more efficiently than privately owned banks. Moreover, Cebenoyan et al. (1993) and Altunbas et al. (2001) find no evidence that supports the assumption that State owned banks operate less efficiently than their privately owned counterparts.

Another research approach emerges from the cross time comparison of pre and post privatisation performance of divested firms. Evidence provided by Megginson, et al. (1994), La Porta and López-de-Silanes (1999), D'Souza and Megginson (1999), Frydman et al. (1999), Harper (2002) and Claessens and Djankov (2002) emphasise that divested firms perform better than in the pre privatisation stage. Nevertheless, most of these studies also find common consequences in privatisation processes, i.e., both price increasing policies and the existence of labour losses in the post privatisation scenario. These facts may help to explain the observed efficiency differences (improvements).

In contrast, studies developed by Martin and Parker (1995), Newbory and Pollitt (1997), Estrin and Rosevear (1999) and Villalonga (2000) remark that ownership does not explain the total efficiency differences in the case of privatised firms. Moreover, it is remarked that efficiency does not equal profit or revenue rates and that unlike ownership, there are other factors such as market competition, political and organisational effects that should be considered when evaluating the performance of State owned and privately owned firms.

Following this research approach, the body of literature on the banking sector mostly focuses on privatisation processes in transitional economies, especially in Eastern Europe (Thorne, 1993; Meyendorff and Snyder, 1997; Bonin and Watchel, 1998). These studies remark both the difficulty of privatisation processes in transitional economies due to political problems and the lack of banking expertise in the economy, and the need to link banking firms' privatisation to strategic foreign investors and an appropriate regulation.

As a consequence, existing empirical evidence dealing with efficiency in banking firms does not give conclusive support to the arguments that relates private forms of enterprise and efficiency, since the mentioned predictions are not fulfilled in a large number of cases. This suggests the need for more empirical research in this area. For a further reference, Megginson and Netter (2001) offer an extensive survey carried out in this field.

The paper seeks to determine and compare the efficiency levels of the Costa Rican banking firms, grouped by their ownership structure and to test whether ownership structure conditions efficiency. The main results of the paper do not lend support the Property Rights Theory, since there is no statistically significant difference between the efficiency levels shown by State owned and privately owned banks. Moreover, we find that the financial firms, according to their organisational structure, follow different paths to attain efficiency.

The remainder of the paper is organised as follows. Section two conducts a brief overview of the Costa Rican financial system. A description of the data and the methodology used are presented in the third section. Empirical findings are discussed in section four. Final conclusions are displayed in section five.

## **2. The Costa Rican banking system**

### *2.1 Background*

In the Costa Rican banking system, like in most developing countries, deregulation processes have taken place seeking an increase in competitiveness. Before 1980, the Costa Rican banking system was tightly regulated in terms of interest rates and activity.

During this period a legal monopoly in the public deposit market was created, where only the State owned banks were able to fund through saving accounts, limiting the entry possibilities for local and foreign competitors.

In 1984, the Costa Rican Central Bank initiated a reform process with the aim to eliminate its influence on bank interest rate pricing policies. Despite the market constraints, the participants in the Costa Rican banking system consolidated. In 1990, a new reform process was initiated, with the following consequences for the financial system. First, the breakdown of the demand deposit monopoly took place in 1992, such that the privately owned banks became able to openly attract resources from the population. Second, all State owned and privately owned banks were allowed to attract resources and grant loans in foreign currency (US dollar).

In 1995 a reform processes in the financial system was undertaken in pursuit of improving the supervision tasks, transparency and competitiveness amongst financial firms. Also, due to the increase in the number of participants in the banking system, the Costa Rican Central Bank created a regulatory organisation. As a consequence of this reform, in 1997 the National Board for the Supervision of the Financial System was created as a collegiate body in charge of controlling the banking system, the stock market, and the pension fund operators.

Before 2001 the banks' monitoring tools were based on ratios that acted as control mechanisms. Within this context the Costa Rican Agency for the Banks' Supervision (SUGEF according to the Spanish acronyms) pursued a policy of improvement and consolidation in the monitoring system and consequently, the last regulatory change in

the Costa Rican banking system took place. The new monitoring tool (CAMELS) came into force in 2001 and it is based on quantitative and qualitative measures. The former group of measures represents the financial ratios that allow for determining the relative performance of the banking firms. These ratios cover the fields of capital structure, asset quality, operating efficiency, profitability, liquidity and market risk sensitivity. The latter group emerges from a survey where the Board of Directors and the organisational strategy are evaluated.

### *2.2 Ownership Structure in the Costa Rican banking system*

Four types of firms jointly participate in the Costa Rican banking system and they can be grouped by their ownership structure. The first group, the State owned banks, is fully owned by the Costa Rican government. These banks basically aim to promote any kind of production activity, along with the development of depressed areas. These firms, as well as the Costa Rican Central Bank, are considered independent since politicians, in accordance with the financial law, do not influence their managerial decisions. This group controls over 55% of the market in 2004. However, this group experienced a downward trend in these issues, resulting in a market share declined by 7.34% and 8.76% in the total assets and deposits, respectively.

The second group is the mutual mortgage banks. They are private non-for profit firms. Furthermore, their activity is linked to a specific economic objective established by the government. They aim to grant low adjustable interest rate mortgages, and to allocate the governmental resources that facilitate mortgage credits to underprivileged families. The mutual mortgage banks have, for 2004, the 4.00% and 4.28% of the asset and deposit market, respectively. Concerning the deposit portfolio, the State owned and

mutual mortgage banks are totally guaranteed by the government. Also, the regulator body exerts no gearing control over these financial firms, i.e., the government guarantee over the deposit portfolio enable these firms to increase their liabilities keeping the same equity levels.

Privately owned banks form the third group. Shareholders hold these firms and they aim to maximise their shareholder value (profit maximisation behaviour). For 2004, this group controls nearly 34% of the asset market and 32.77% of all deposits in the sector. Furthermore, these firms experienced an upward trend during the period 1998-2004, leading to an improvement in terms of market share. Thus, for the same period, their assets increased 25.82%, whereas their deposits enhanced 36.35%.

The last group is made up of cooperative financial firms. These firms have as a primary objective to attend the loan and saving needs of their cooperative members. They also promote the development of the cooperative partners' geographical areas. As well as with the previous banking groups, their capability for financial activities is unrestricted. As well as the privately owned banks, this group significantly enlarged its market share in terms of both assets (45.68%) and deposits (57.07%).

As a result, the Costa Rican banking system can be catalogued as particular, since four types of financial firms (according to their ownership structure) jointly participate in the market. Nevertheless, the fact that mutual mortgage and privately owned banks, as well as cooperative financial firms are taking market share away from the State owned banks, and the absence of interest rate restrictions can be considered as evidence of increased competition in the banking system. Consequently, to test whether the

ownership structure has an impact on banking firms' efficiency, operational, organisational, as well as competitive aspects must also be considered when assessing these financial firms performance.

### **3. Estimation of Efficiency: An application to the Costa Rican banking system**

#### *3.1 Data*

This paper uses information from the bank's accounting statements provided by the Costa Rican Central Bank for the period 1998-2004. Although the period under analysis witnessed a large number of mergers, acquisitions, we decided to use an unbalanced panel data, which includes all the commercial banking firms for each year considered in the analysis. We excluded the non-banking firms from the sample, since they do not operate in the market under the same conditions (these firms cannot fund themselves through deposits), and they do not obey the same regulatory framework when compared to the rest of banking firms. Consequently, the final sample consists of the State owned banks, mutual mortgage banks, privately owned banks, and the cooperative financial firms. For the period under analysis, we include the 3 commercial State owned banks. There are 4 mutual mortgage banks for the period 1998-2000 and 3 for the period 2001-2004. The number of privately owned banks decreased substantially from 21 in 1998 to 12 in 2004. This is due to the large number of mergers and acquisitions undergone in the market. Finally, the cooperative financial firms account for 25 firms for the period 1998-2003 and 24 in 2004. The total sample size calculated over the period under analysis is 337.

Since the last regulatory change came into force in 2001, and considering that this new regulatory framework may have a differentiated effect upon bank's strategy, we proceed

as in Kumbhakar, et al (2001) and Tortosa-Ausina (2003), by considering in the analysis two sub-periods, 1998-2000 (pre-regulation period) and 2001-2004 (post-regulation period).

### *3.2 Operational factors that explain efficiency differences*

We measure efficiency through financial indicators, as in La Porta and Lopez-de-Silanes (1999), D'Souza and Megginson (1999), Verbrugge et al. (1999), and Dewenter and Malatesta (2001). As dependent variables we use the return on equity ( $ROE_{i,t}$ ), measured as activity income ( $AI_{i,t}$ ) divided by equity ( $EQ_{i,t}$ ); and the return on assets ( $ROA_{i,t}$ ), calculated as the ratio of activity income ( $AI_{i,t}$ ) to performing assets ( $PA_{i,t}$ ). The performing assets consider both the share corresponding to performing loans ( $PL_{i,t}$ ) and investment portfolio ( $IP_{i,t}$ ). Henceforth, the subscript  $i$  is referred to the firm under assessment in the  $t$  period.

The aforementioned empirical studies usually considered these variables as appropriate proxies for measuring the financial institution's efficiency. However, our approach does not consider these variables as independent factors. We formulate a model that relates  $ROE_{i,t}$  and  $ROA_{i,t}$  to a set of independent operational factors. The description of the independent variables follows.

First, we consider a measure of operating efficiency, i.e., the net interest margin ( $NM_{i,t}$ ), calculated as the difference between interest income and interest expense relative to performing assets. To measure the asset structure we use the ratio of performing assets to total assets ( $PA_{i,t}/TA_{i,t}$ ). Since this variable is expressed

as  $PA_{i,t}/TA_{i,t} = (PL_{i,t}/TA_{i,t}) + (IP_{i,t}/TA_{i,t})$  we can determine the relative weight that the loan and the investment portfolios have upon the performing assets. In addition,  $PL_{i,t}/TA_{i,t} = (TL_{i,t}/TA_{i,t}) \times (PL_{i,t}/TL_{i,t})$ , where  $PL_{i,t}/TL_{i,t}$  is especially relevant, since it represents a quality measure of the loan portfolio, i.e., an inverse of the so-called bad output (Berger and De Young, 1997, Berger and Mester, 1997, Drake and Hall, 2003). Also, this variable forms a part of the regulatory framework used by the Costa Rican Central Bank and the monitoring agency (SUGEF) to oversee the banking firms' performance.

The ratio of total assets to total deposits ( $TA_{i,t}/TD_{i,t}$ ) represents a financial variable (liquidity) that enables the assessment of the firms' capability to allocate the borrowed resources. We propose the ratio of deposits to equity ( $TD_{i,t}/EQ_{i,t}$ ) as a proxy for the bank's leverage. The ratio of non-interest income to performing assets ( $OI_{i,t}/PA_{i,t}$ ) represents a diversification variable related to the firm activity's income. Regarding the operating costs, we consider the ratio of material costs to performing assets ( $MC_{i,t}/PA_{i,t}$ ), and the ratio of labour costs to performing assets ( $LC_{i,t}/PA_{i,t}$ ). Consequently, our primary model entails a factorial decomposition framework of the profitability rates, expressed as follows:

$$ROE_{i,t} = \frac{AI_{i,t}}{EQ_{i,t}} \equiv ROA_{i,t} \times \frac{PA_{i,t}}{TA_{i,t}} \times \frac{TA_{i,t}}{TD_{i,t}} \times \frac{TD_{i,t}}{EQ_{i,t}} \quad [1]$$

$$ROA_{i,t} = NM_{i,t} + \frac{OI_{i,t}}{PA_{i,t}} - \frac{LC_{i,t}}{PA_{i,t}} - \frac{MC_{i,t}}{PA_{i,t}}$$

As in Wolff (2003), our model is based on the first order partial finite differences in the dependent variables. This is possible considering the additive properties of the continuous variation rates in a discrete variable multiplicative function. To ensure the fulfilment of the models, all the variables are constructed in terms of weighted means. These formulations allow us to determine, for each firm and especially for each set of financial firms, the extent of the observed variation in the profitability indicators (*ROE* and *ROA*) that can be attributed to each one of the independent factors selected.

In this stage, we use the Mann-Whitney U test and the Z-Wilcoxon signed rank test as our principal methods of testing for significant changes in the computed variables. Through the Mann-Whitney U test it is possible to determine, for a specific period, whether the observed median difference between two groups of financial firms do not share the same central tendency. The Z-Wilcoxon signed rank procedure tests whether the observed median difference for a specific group of financial firms in two different time periods is zero (Gibbons, 1993). Descriptive statistics for the set of operational variables are presented in Tables 1 and 2, where some preliminary results can be obtained.

--- Insert Table 1 approximately here ---

--- Insert Table 2 approximately here ---

Considering the whole period under analysis, the only statistically significant difference in efficiency levels (*ROE* and *ROA*) emerges when comparing the State owned banks and the cooperative financial firms. Also, the State owned banks have the more

diversified asset portfolio, the highest level of bad loans, as well as the highest labour expenses relative to performing assets (Table 1).

When comparing the results for the two sub-periods (1998-2000 and 2001-2004), we observe that all the banking groups improved their efficiency measures (*ROE* and *ROA*) but the observed variation are more significant in the case of the *ROE*. In addition, the State owned banks have the least performing asset portfolio when evaluating both the whole period and the periods 1998-2000 and 2001-2004. Also, all the bank groups with the exception of the privately owned banks improved their loan quality ratio. Finally, the privately owned banks and the cooperative financial firms experienced a decrease in their ratio of labour expense relative to performing assets as well as in their fee based income ratio (Table 2).

### *3.3 Impact of organisational factors and competition on efficiency*

In this section we propose a regression analysis that allows for considering the impact of organisational factors over the efficiency of the different types of banking firms. As we previously mentioned, the Costa Rican government guarantees the deposit portfolio of the State owned banks and the mutual mortgage banks. This fact enables these firms to increase their leverage ratio with no restriction and to have a different capital strategy as compared to the privately owned banks and the cooperative financial firms. Consequently, as in Verbrugge et al. (1999), Villalonga (2000), Berger and Mester (2003) and Crespí et al. (2004), we assess banks' performance through *ROA*.

As independent variables, we consider the size of the firm (*SIZE*), measured as the natural logarithm of total assets. This variable accounts for the potential economies of

scale and scope experienced by firms. In addition, to test for the presence of a non-linear relationship between size and efficiency we also include a quadratic term for size. We introduce dummy variables for the different ownership structures, i.e., State owned banks (*SOE*), mutual mortgage banks (*MMB*), privately owned banks (*POE*), and cooperative financial firms (*CFF*). Time trends are also included to account for the potential impact of competition over time. This variable takes the value of 1 for the year 1998, 2 for the year 1999 and 7 for the year 2004.

As mentioned above, the State owned banks have social aims to fulfil. These goals affect the products and services offered (product mix), and the geographic dispersion of branches in both urban and rural areas (market coverage). To reflect these objectives and their impact over efficiency, we measure the product mix diversification at bank level through the Herfindahl-Hirschman Index on the banks' credit portfolio ( $HHI^{Loan}$ ). To estimate market concentration at province level, we again use the Herfindahl-Hirschman Index but this time on bank branches ( $HHI^{Market}$ ). Interaction terms between  $HHI^{Loan}$ ,  $HHI^{Market}$ , as well as *TIME* and ownership dummies are introduced to account for the impact of these variables on the different types of banks. Thus, the model to be estimated follows:

$$\begin{aligned}
 ROA_{i,t} = & a_{i0} + \beta_1 Size_{i,t} + \beta_2 Size_{i,t}^2 + \beta_3 Ownership_{i,t} + \beta_4 HHI_{i,t}^{Loan} \\
 & + \beta_5 HHI_{i,t}^{Market} + \beta_6 Time_{i,t} + \beta_7 Ownership_{i,t} \times HHI_{i,t}^{Loan} \\
 & + \beta_8 Ownership_{i,t} \times HHI_{i,t}^{Market} + \beta_9 Ownership_{i,t} \times Time_{i,t} + \varepsilon_{i,t}
 \end{aligned} \tag{2}$$

--- Insert Table 3 approximately here ---

We observe from Table 3 that the objectives of the State owned banks are reflected in the structural variables, since these banks have the largest market coverage, and the most diversified loan portfolio. The privately owned banks appear as a group that focuses on a specific market (urban areas), although they have a relatively high-diversified loan portfolio. In the case of the mutual mortgage banks, their narrow product mix reflect the social goal imposed to these firms, i.e., to grant low adjustable interest rate mortgages to underprivileged people. The results for the cooperative financial firms are in accordance with their nature, since these firms have few branches, mostly located in rural areas, and their credit portfolio is concentrated in activities related to agriculture, livestock farming, and consumption.

Concerning the multivariate analysis, we first test for the presence of groupwise heteroskedasticity and autocorrelation in all the models estimated. The results emerging from the Breusch-Pagan test (1979) leads to reject the null hypothesis of constant variance across groups. The result of the Wooldridge test (2000) for autocorrelation in panel data models leads to reject the null hypothesis of no first order autocorrelation. Given the structure of the covariance matrix and the error term, we consider that the appropriate estimation method for equation [2] is through feasible generalised least squares (FGLS).

## **4. Empirical results**

### *4.1 Cross time results*

Table 4 presents the formal decomposition of changes in efficiency rates between the period 1998-2000 and the period 2001-2004 into its components (Equation [1]).

Concerning the State owned banks, the empirical findings show that the mean value for the efficiency indicators (*ROE* and *ROA*) in the period 2001-2004 did not improved in a statistically significant way as compared to that obtained in the period 1998-2000. For this group the variation in the *ROE* ratio is due to two main effects. On the one hand, the largest negative impact results from the leverage variable (-3.28%). On the other hand, the largest positive impact over *ROE* was caused by the improvement of 0.82% in the ratio of total loans relative to total assets ( $TL/TA$ ) (Table 4). Also, the result of the investment portfolio ratio (-0.1810%) shows that this group is concentrating their resources on traditional banking activities (credit portfolio). These results indicate that for the State owned banks the net impact of the shift in the asset portfolio (captured by the downturn in the investment portfolio and the consequent growth in the loan portfolio) had a net positive impact upon *ROE*.

In the case of the mutual mortgage banks, the changes in *ROE* (7.67%) and *ROA* (8.30%) are the largest amongst the different types of banking firms. For these firms, the variation in *ROE* is mainly explained by the improvement in the loan quality ratio (0.16%) and the increase in the relative weight of the investment portfolio (0.85%). In both cases, the median values obtained in the period 1998-2000 are statistically significant different to those obtained in the period 2001-2004. Conversely, the only variable that exerts a statistically significant negative influence upon *ROE* is the leverage ratio (1.69%).

Concerning the *ROA* components, the non-financial expenses (15.33%), especially the labour cost ratio (10.40%), exert the greatest (positive) effect over *ROE*. The decrease in the net interest margin and the fee based income ratio produce an expected negative

effect over *ROE*, 1.81% and 5.22%, respectively. Despite the large impact of these variables over *ROE*, the lack of significance in the variation rates for these factors prevents us from making any further comments.

--- Insert Table 4 approximately here ---

Concerning the privately owned banks, the results reveal that the differences in *ROE* are mainly explained by variations in the *ROA* components, changes in the composition of the asset portfolio and the leverage ratio. On the one hand, the empirical findings indicate that these firms are carrying out a more restricted labour policy which led to a positive impact upon *ROE* by 4.23%. Also, the increase in the market share that these banking firms experienced in terms of deposit portfolio (36.35%) between the periods 1998-2000 and 2001-2004, helps to explain the positive and statistically significant impact that the leverage ratio has upon efficiency. On the other hand, the most significant factor that negatively affects *ROE* is the decrease in the fee based income activities (5.67%). In the case of the asset portfolio, we observe that during the period under analysis these firms focus their activities on loans and this is detrimental to the investment portfolio (0.42%). Also, these banking firms experienced a slight and significant decrease in their loan quality ratio (0.002%).

Regarding the results for the cooperative financial firms, we observe that the variables that positively affect *ROE* are related to the non-financial expenses, i.e., the labour cost ratio (4.51%) and the office costs ratio (2.30%). For these variables, the reported changes are statistically significant. On the contrary, the downturns in the net interest

margin (4.62%) and the non-interest activities (1.82%) produced the most significant negative impact over *ROE*.

As in the case of the mutual mortgage banks, this group experienced a statistically significant increase in their investment portfolio (0.42%) which could indicate that these banking firms are diversifying their asset portfolio to improve their efficiency results. Moreover, these firms experienced an improvement in the loan quality ratio (0.16%) which positively affected their *ROE* ratio.

#### *4.2 Cross section results*

In this section we carry out the model proposed in Equation [1] to decompose the efficiency differences in the profitability rates between State owned banks and the remaining types of financial firms. Tables 5 and 6 present the decomposition results for the period 1998-2004 and for the sub-periods 1998-2000 and 2001-2004, respectively.

The findings indicate that for the period 1998-2004, the only statistically significant difference in the *ROE* ratio emerges when comparing the results of the State owned banks and the cooperative financial firms. However, and despite the reduction in the efficiency gap, this result is statistically significant when comparing the *ROE* ratios for the period 2001-2004 (Tables 5 and 6). The results in this period show a lower dispersion in both groups, leading to the mentioned statistically significant difference.

Considering the *ROA* components, we observe that the cooperative financial firms operate with statistically significant higher interest margins than the State owned banks. Also, the cooperative financial firms reduced substantially their non-financial costs,

especially the labour-capital ratio, and these firms show superior levels of performing assets relative to total assets. Conversely, the impact of the funding capacity variable (leverage) exerts the largest influence in favour of the State owned banks. This result can be attributed to the larger funding capacity of these firms. This is because the cooperative financial firms can only obtain equity capital from their cooperative partners, and their market segment is bounded to specific rural areas.

--- Insert Table 5 approximately here ---

Comparing the results for the State owned and mutual mortgage banks, the findings in Tables 5 and 6 show that the fee-based income ratio is the main factor explaining the observed differences in the *ROE* ratio. This leads to conclude that non-traditional activities are relevant for the State owned banks and they generate important gains. This result reflects the limited field of action of the mutual saving banks in the market, which forces these firms to concentrate their operations in mortgages.

--- Insert Table 6 approximately here ---

In addition, it is also important to remark that the variation in the quality of the loan portfolio and the labour cost ratio are relevant factors that help to explain the observed differences in *ROE* between these groups of firms. In the case of the former ratio, the result indicates that the mutual mortgage banks experienced an important improvement in their loan portfolio quality; whereas the latter finding shows that the mutual mortgage banks are reducing to a greater rate this ratio (labour cost relative to performing assets)

as compared to the State owned banks and this finding is statistically significant for the period 2001-2004.

Evaluating the results of the State owned and the privately owned banks, we observe no statistically significant difference in the efficiency measures (*ROA* and *ROE*). Explaining the efficiency differences, the higher interest margin and the more diversified performing assets shift the balance in favour of the State owned banks (Tables 5 and 6). Conversely, the privately owned banks have a lower labour-capital ratio and a higher rate of performing loans relative to total loans. Both these factors are statistically significant and these results could lead to believe that the State owned banks apply more relaxed credit policies to their bad creditors as compared to the privately owned banks.

#### *4.3 Impact of organisational factors and competition upon efficiency*

This section presents the results of the regressions estimated by feasible generalised least squares (FGLS). Model 1 considers individually the impact of ownership structure upon efficiency. Specifications 2, 3 and 4 account for the differential effect of product diversification, market coverage and time trend on the different types of banks, respectively. Since there is only one observation for the Banco del Istmo S.A. and Coopebanpo, these banks were dropped from the sample. In the case of the former, it was acquired by Banco Banex S.A. in 1999 and the latter operates in the banking market since 2004. In terms of assets these banks represent the 0.1077%. Consequently, the sample used accounts for more of the 99% of banking activity in Costa Rica. The results are presented in Table 7.

--- Insert Table 7 approximately here ---

Consistent with the findings obtained through the factorial decomposition model, privately owned banks do not perform better than State owned banks. From specification 1 we observe that the mutual mortgage banks are less efficient over time as compared to the State owned banks ( $\beta_3 < 0$ ). Also, the parameter estimate for the cooperative financial firms indicates that these firms are more efficient than the State owned banks ( $\beta_3 > 0$ ).

As regards to size, the empirical findings are similar to those reported by Altunbas, et al (2001). The results in every specification indicate that the relationship between size and efficiency is inverse U shaped ( $\beta_1 > 0$  and  $\beta_2 < 0$  in equation [2]). Thus, economies of scale and scope are present especially in small banks, but beyond a crucial threshold, larger firms experience lower performance.

From model 1 we observe that the coefficient for the product mix variable is positive and highly statistically significant indicating that, all else equal, firms with more concentrated credit portfolios are more efficient. However, model 2 reveals that this is especially relevant in the case of privately owned banks and the cooperative financial firms. In the case of the latter group of banks, it's important to remark that these firms are mostly located in rural areas, confirming that these firms prefer to allocate financial resources in few credit categories, mainly related to agriculture and livestock farming. This finding, similar to that reported in Girardone, et al. (2004), may confirm that the cooperative financial firms have established local monopolies due to their strategic position in the market (at the local level). Concerning the mutual mortgage banks, the

lack of significance in the parameter estimate is not surprising due to aforementioned product diversification experienced by these firms during the period analysed.

The results emerging from specification 4 indicate that both privately owned and cooperative banks perform better than the State owned banks. Also, the findings indicate that competition improved the performance of all banks ( $\beta_6 > 0$ ). However, the negative coefficient for the terms *Time* × *Ownership dummies* indicate that competition contributed significantly more to the performance of the State owned banks, narrowing the performance gap between this group and the rest of banking firms. Thus, in the case of the privately owned banks the parameter estimate shows that this group is slightly more efficient than the State owned banks ( $\beta_3 > 0$ ), but by the year 2004 the result for the interaction term that relates time trend and ownership indicates that competition reduced this performance gap by 1.54% ( $\beta_9 = -0.0022 \times 7$  in equation [2]).

Similar results emerge for the cooperative financial firms. For these banks  $\beta_3 > 0$  and shows as statistically significant, indicating better performance results as compared to the State owned banks. Nevertheless, the net impact of competition upon performance is -2.03% ( $\beta_9 = -0.0029 \times 7$  in equation [2]), indicating that competition narrowed the performance gap between this group and the State owned banks. This finding could reflect that the State owned banks, due to the regulatory changes experienced in the market, together with their policies, have become tough competitors hindering the growth of privately owned banks.

## 5. Concluding remarks

In this paper, we aim to determine the causes of the observed differences in efficiency measures in the Costa Rican banking system considering operational, organisational and competition variables.

The main conclusion to be drawn from the results of the paper is that ownership structure does not explain the efficiency differences amongst the different types of financial firms in the Costa Rican banking system. The empirical results, which were obtained from a factorial decomposition model and a regression analysis, do not lend support the Property Rights Theory assumption, which asserts that State owned firms are less efficient than privately owned firms.

The results indicate that all the types of banking firms experienced an improvement in their efficiency measures (*ROE* and *ROA*) when comparing the results for the period 1998-2000 to those obtained in the period 2001-2004. For the State owned banks, efficiency variation is mainly explained by changes in their asset portfolio, i.e., these firms are allocating their resources to loans, leading to a decrease in the relative weight of the investment portfolio in the asset's structure. The mutual mortgage banks direct their efforts to improve the quality of their loan (mortgage) portfolio. Also, and as a consequence of the new regulatory framework, these banks are changing their asset's structure, due to they allocate their resources in activities related to financial investments. The results indicate that the path followed by privately owned banks to improve their efficiency ratios is linked to an increase in their liquidity ratio to allocate these financial resources to credit activities, as well as reducing their labour costs (relative to their performing assets).

The results for the cooperative financial firms are especially interesting. Economies of scale and high market concentration (at local level) are present in this group, facts that might be evidence of possible local monopolies. Also, these firms are diversifying their asset portfolio, and improving the quality of their loan portfolio. Finally, these firms prefer to improve their *ROA* ratio through a cost contention policy, i.e., reducing their non-financial expenses relative to the performing assets.

Interestingly, for all the types of banks fee-based income shows as a not relevant tool for improving their performance (*ROA*). This is one of the more interesting extensions to the present work.

This paper has important implications for both policy makers and researchers, since the Costa Rican banking firms are following different paths, depending on the objectives they pursue, to attain efficiency improvements. This is especially relevant since profit rates are too narrow a view for measuring efficiency. Consequently, when assessing State owned banks, it must be considered that these firms aim to be efficient in a broader view, accounting for social objectives more related to stakeholders, like universalising the access to products and services offered by the financial system.

The results of the paper encourage us to further research in this field, because the findings suggest that rather than privatisation strategies, policies that lead to the establishment of effective monitoring mechanisms that aim to foster competition may also yield to efficiency improvements.

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Table 1: Descriptive Statistics for the selected variables (Period 1998 – 2004)

<b>Variables</b>	<b>State owned banks</b>	<b>Mutual mortgage banks</b>	<b>Privately owned banks</b>	<b>Cooperative financial firms</b>	<b>TOTAL</b>
Return on equity (ROE)	0.14872 (0.08788)	0.07668 (0.07699)	0.13166 (0.07411)	0.07819 ** (0.08416)	0.10094 (0.08377)
Return on assets (ROA)	0.01465 (0.01138)	0.01033 (0.00676)	0.01652 (0.0097)	0.03373 ** (0.03675)	0.02485 (0.02212)
Net interest margin to performing assets	0.05646 (0.01184)	0.06800 (0.00848)	0.04630 (0.02329)	0.10591 *** (0.04427)	0.07926 (0.04474)
Fee based income to performing assets	0.02572 (0.00386)	0.01032 (0.00784)	0.03063 (0.02084)	0.02117 (0.02064)	0.02399 (0.02022)
Labour expenses to performing assets	0.04485 (0.00288)	0.04087 (0.00572)	0.03061 * (0.01623)	0.05703 (0.02657)	0.04587 (0.02462)
Office expenses to performing assets	0.02266 (0.00322)	0.02712 (0.00406)	0.02980 (0.01983)	0.03631 ** (0.01844)	0.03253 (0.01822)
Non financial expenses to performing assets	0.06753 (0.00459)	0.06799 (0.00928)	0.06041 (0.03510)	0.09335 ** (0.04241)	0.07840 (0.04008)
Total loans to total assets	0.36766 (0.0747)	0.70236 *** (0.06227)	0.61827 *** (0.11935)	0.65054 *** (0.14887)	0.62530 (0.14795)
Performing loans to total loans	0.95990 (0.0288)	0.96619 (0.01672)	0.98113 *** (0.02511)	0.97406 (0.02807)	0.97509 (0.02697)
Performing loans to total assets	0.35378 (0.07537)	0.67888 *** (0.06484)	0.60703 *** (0.11974)	0.63436 *** (0.14822)	0.61048 (0.14725)
Investment portfolio to total assets	0.43635 (0.0577)	0.11201 *** (0.04939)	0.23159 *** (0.11475)	0.21020 *** (0.13984)	0.22479 (0.13730)
Performing assets to total assets	0.79013 (0.04521)	0.79089 (0.05742)	0.83862 ** (0.06677)	0.84456 ** (0.07990)	0.83527 (0.07419)
Total assets to deposits	1.15292 (0.04937)	1.10021 (0.01917)	1.36047 (0.18503)	1.97251 *** (1.07438)	1.64501 (0.85248)
Deposits to equity	12.76855 (4.13073)	15.80966 *** (5.10599)	6.71749 *** (2.83343)	2.69670 *** (2.09998)	5.66606 (4.82939)
Number of firms	21	24	118	174	337

\*, \*\*, \*\*\* indicates significance at the 0.10, 0.05, and 0.01 level, respectively. The reference group is State owned banks.

Table 2: Descriptive Statistics for the selected variables (periods 1998 – 2000 and 2001 – 2004) <sup>a)</sup>

Variables	1998 – 2000					2001 – 2004				
	SOE	MMB	POE	CFI	TOTAL	SOE	MMB	POE	CFI	TOTAL
Return on equity (ROE)	0.15361	0.07660	0.13113	0.08503	0.13615	0.16497	0.15328 **	0.18583 **	0.11422 **	0.16546 ***
Return on assets (ROA)	0.01360	0.00586	0.01769	0.03346	0.01536	0.01707	0.01241 ***	0.02037	0.03472	0.01902
Net interest margin (NIM) to performing assets	0.05609	0.06902	0.03636	0.10479	0.05228	0.05903	0.06760	0.04004	0.08887 ***	0.05387 *
Fee based income to performing assets	0.02610	0.01019	0.03419	0.02062	0.02785	0.02526	0.00608	0.02732 *	0.01434 ***	0.02499 *
Labour expenses to performing assets	0.04514	0.04474	0.02822	0.05715	0.04040	0.04462	0.03653	0.02310 *	0.04161 ***	0.03647 ***
Office expenses to performing assets	0.02345	0.02862	0.02463	0.03480	0.02437	0.02260	0.02474	0.02389	0.02689 ***	0.02336 ***
Non financial expenses to performing assets	0.06859	0.07336	0.05286	0.09195	0.06477	0.06722	0.06126	0.04699	0.06849 ***	0.05984 ***
Total loans to total assets	0.36738	0.68872	0.62813	0.66550	0.46381	0.40989 ***	0.68625	0.67653	0.67983	0.52462
Performing loans to total loans	0.96094	0.95763	0.98558	0.96671	0.97095	0.97178	0.97434 *	0.98545 *	0.98778 ***	0.97909 ***
Performing loans to total assets	0.35303	0.65954	0.61907	0.64335	0.45034	0.39832 ***	0.66864	0.66669	0.67152	0.51365 **
Investment portfolio to total assets	0.42323	0.08457	0.22045	0.19238	0.34540	0.41420 *	0.14414 **	0.19780 *	0.22930 ***	0.32126 ***
Performing assets to total assets	0.77626	0.74411	0.83952	0.83573	0.79574	0.81252 **	0.81278 ***	0.86449 ***	0.90083 ***	0.83490 ***
Total assets to deposits	1.14379	1.09680	1.31002	1.64607	1.19781	1.14885	1.10435	1.23269	1.49201 ***	1.18847 ***
Deposits to equity	12.72258	16.02945	6.74115	1.84708	9.29754	10.35434 ***	13.75889 **	8.55913 **	2.44774 ***	8.76644 **
Number of firms	9	12	59	75	155	12	12	59	99	182

a) SOE = State-owned banks, MMB = Mutual mortgage banks, POE = Privately owned banks, and CFI = Cooperative financial firms. \*, \*\*, \*\*\* indicates significance at the 0.10, 0.05, and 0.01 level, respectively (Z Wilcoxon signed rank test).

Table 3: Descriptive Statistics (period 1998 – 2004)

	State owned banks	Mutual mortgage banks	Privately owned banks	Cooperative financial firms	TOTAL
<b>Panel A (1998-2004)</b>					
Size <sup>a)</sup> (Assets)	668692.20 (370166.20)	44570.14 *** (28075.60)	66593.58 *** (74692.41)	5567.13 *** (7755.77)	71035.44 (186507.00)
Loan diversification (HHI)	0.23043 (0.05530)	0.74643 *** (0.10726)	0.32204 (0.15751)	0.76421 *** (0.27580)	0.57486 (0.31512)
Market coverage (HHI)	0.23018 (0.03266)	0.44230 ** (0.07138)	0.66222 *** (0.27476)	0.86094 *** (0.25109)	0.72224 (0.30186)
Number of firms	21	24	118	174	337
<b>Panel B (1998-2000)</b>					
Size <sup>a)</sup> (Assets)	609376.90 (318179.40)	35421.34 *** (20184.37)	42208.76 *** (43067.32)	3225.82 *** (4588.07)	56043.24 (159137.70)
Loan diversification (HHI)	0.23505 (0.07777)	0.71202 *** (0.06456)	0.32464 (0.12561)	0.78194 *** (0.27107)	0.57070 (0.30811)
Market coverage (HHI)	0.23239 (0.03374)	0.46894 (0.08396)	0.68662 *** (0.28460)	0.87439 *** (0.22740)	0.73425 (0.29420)
Number of firms	9	12	59	75	155
<b>Panel C (2001-2004)</b>					
Size <sup>a)</sup> (Assets)	713178.60 (412877.10)	53718.93 *** (32528.58)	90978.40 *** (90496.20)	6886.31 *** (9285.09)	83803.52 (206566.10)
Loan diversification (HHI)	0.22700 (0.03362)	0.78084 *** (0.13154)	0.31944 (0.18507)	0.75078 *** (0.27995)	0.57839 (0.32178)
Market coverage (HHI)	0.22852 (0.03323)	0.41566 (0.04532)	0.63782 *** (0.26473)	0.85076 *** (0.26864)	0.71201 (0.30867)
Number of firms	12	12	59	99	182

a) Monetary values are expressed in million of constant Costa Rican colons (currency). \*, \*\*, \*\*\* indicates significance at the 0.10, 0.05, and 0.01 level, respectively. The reference group is State owned banks.

Table 4: Explanatory factors for the variation in the selected variables between the 1998-2000 period and the 2001-2004 period <sup>(a)</sup>

	<b>SOE</b>	<b>MMB</b>	<b>POE</b>	<b>CFI</b>
<b>Return on equity (ROE)</b>	<b>1.13660</b>	<b>7.66814</b> **	<b>5.46961</b> **	<b>2.91909</b> **
Performing assets to total assets	0.72697 **	0.97575 ***	0.45980 ***	0.74184 ***
Performing loans to total assets	0.90794 ***	0.12930	0.87693	0.32112
Performing loans to total loans	0.08440	0.16324 *	-0.00154 *	0.16153 ***
Total loans to total assets	0.82354 ***	-0.03394	0.87847	0.15959
Investment portfolio to total assets	-0.18096 *	0.84644 **	-0.41713 *	0.42072 ***
Total assets to deposits	0.07028	0.07585	-0.95469	-0.97191 ***
Deposits to equity	-3.27953 ***	-1.68846 **	3.74614 **	2.78481 ***
<b>Return on assets (ROA)</b>	<b>3.61887</b>	<b>8.30500</b> ***	<b>2.21835</b>	<b>0.36435</b>
Net interest margin (NIM) to performing assets	3.06604	-1.80646	3.03871	-4.61945 ***
Fee based income to performing assets	-0.87523	-5.21499	-5.66698 *	-1.82304 ***
Non financial expenses to performing assets	-1.42806	-15.32645	-4.84663	-6.80684 ***
Labour expenses to performing assets	-0.53999	-10.40239	-4.22824 *	-4.51020 ***
Office expenses to performing assets	-0.88807	-4.92405	-0.61838	-2.29664 ***
Number of firms	21	24	118	174

(a) Values represent percentage points, and they result from the decomposition presented in Equation [1]. SOE = State-owned banks, MMB = Mutual mortgage banks, POE = Privately owned banks, and CFI = Cooperative financial firms. \*, \*\*, \*\*\* indicates significance at the 0.10, 0.05, and 0.01 level, respectively (Z Wilcoxon signed rank test).

Table 5: Explanatory factors for efficiency differences between the State-owned banks  
and the rest of types of firms <sup>(a)</sup>

	<i>1998 – 2004</i>		
	<i>SOE vs. MMB</i>	<i>SOE vs. POE</i>	<i>SOE vs. CFI</i>
<b>Return on equity (ROE)</b>	<b>7.20451</b>	<b>1.70622</b>	<b>7.05301</b> ***
Performing assets to total assets	0.83026	-0.47983 ***	-0.24655 ***
Performing loans to total assets	-3.84154 ***	-3.42033 ***	-3.39160 ***
Performing loans to total loans	0.02661	-0.17474 ***	0.00670 ***
Total loans to total assets	-3.86815 ***	-3.24558 ***	-3.39831 ***
Investment portfolio to total assets	4.67179 ***	2.94050 ***	3.14506 ***
Total assets to deposits	0.51831 ***	-2.16455 ***	-3.90957 ***
Deposits to equity	-4.27685	7.79406 ***	19.53545 ***
<b>Return on assets (ROA)</b>	<b>10.13279</b>	<b>-3.44346</b>	<b>-8.32632</b> ***
Net interest margin (NIM) to performing assets	-10.80328 ***	15.46253 ***	-23.95989 ***
Fee based income to performing assets	16.92802 ***	-7.23831	1.61072 **
Non financial expenses to performing assets	-4.00806	11.66768 ***	-14.02285 ***
Labour expenses to performing assets	0.40879 ***	12.92800 ***	-7.75007 ***
Office expenses to performing assets	-4.41685 ***	-1.26032	-6.27278 ***

(a) Values represent percentage points, and they result from the decomposition presented in Equation [1]. SOE = State-owned banks, MMB = Mutual mortgage banks, POE = Privately owned banks, and CFI = Cooperative financial firms. \*, \*\*, \*\*\* indicates significance at the 0.10, 0.05, and 0.01 level, respectively (Mann-Whitney U Test).

Table 6: Explanatory factors for efficiency differences between the State-owned banks and the rest of types of firms for the two periods under analysis <sup>(a)</sup>

	<i>1998 – 2000</i>			<i>2001 – 2004</i>		
	<i>SOE vs. MMB</i>	<i>SOE vs. POE</i>	<i>SOE vs. CFI</i>	<i>SOE vs. MMB</i>	<i>SOE vs. POE</i>	<i>SOE vs. CFI</i>
<b>Return on equity (ROE)</b>	<b>7.70067</b>	<b>2.24741</b>	<b>6.85781</b>	<b>1.16912</b>	<b>-2.08559</b>	<b>5.07531</b> ***
Performing assets to total assets	0.46810 ***	-1.11308 ***	-0.85602 ***	-0.00503 ***	-1.08610 ***	-1.42418 ***
Performing loans to total assets	-4.46300 ***	-4.68090 ***	-4.17858 ***	-5.29070 ***	-5.60894 ***	-4.40623 ***
Performing loans to total loans	0.02465 ***	-0.21102 ***	-0.04170 ***	-0.02683 ***	-0.15213 ***	-0.13778 ***
Total loans to total assets	-4.48766	-4.46989 **	-4.13687 *	-5.26387	-5.45681 ***	-4.26845 ***
Investment portfolio to total assets	4.93110	3.56782 **	3.32256	5.28568	4.52284 ***	2.98205 **
Total assets to deposits	0.46430 ***	-1.92785 ***	-4.22130 ***	0.62835 **	-1.23390 ***	-3.60794 ***
Deposits to equity	-2.55709	9.02373 ***	22.37703 ***	-4.52160	3.33580 ***	19.90927 ***
<b>Return on assets (ROA)</b>	<b>9.32536</b>	<b>-3.73539</b> *	<b>-10.44190</b> **	<b>5.06739</b>	<b>-3.10139</b>	<b>-9.80184</b> **
Net interest margin (NIM) to performing assets	-15.57245 **	18.02767 *	-25.59815 ***	-9.31914 ***	17.82301 ***	-16.57005 ***
Fee based income to performing assets	19.15043 ***	-7.39029	2.87590	20.86981 ***	-1.93969	6.06131 *
Non financial expenses to performing assets	-5.74738	14.37277 **	-12.28035 ***	6.48328	18.98472 ***	-0.70690 **
Labour expenses to performing assets	0.48490	15.45454 ***	-6.31209 ***	8.81096 ***	20.19224 ***	1.67585
Office expenses to performing assets	-6.23229 ***	-1.08177	-5.96826 ***	-2.32768 **	-1.20752	-2.38275 ***

(a) Values represent percentage points, and they result from the decomposition presented in equation [1]. SOE = State-owned banks, MMB = Mutual mortgage banks, POE = Privately owned banks, and CFI = Cooperative financial firms. \*, \*\*, \*\*\* indicates significance at the 0.10, 0.05, and 0.01 level, respectively (Mann-Whitney U Test).

Table 7: The impact of organisational factors and competition upon efficiency <sup>(a)</sup>

<i>Independent variables</i>	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>	<i>Model 4</i>
Size (ln assets)	0.0170 <sup>***</sup> (0.0066)	0.0197 <sup>***</sup> (0.0064)	0.0189 <sup>**</sup> (0.0074)	0.0205 <sup>***</sup> (0.0067)
Size squared (ln assets)	-0.0006 <sup>**</sup> (0.0003)	-0.0008 <sup>***</sup> (0.0003)	-0.0007 <sup>**</sup> (0.0003)	-0.0008 <sup>**</sup> (0.0003)
Mutual mortgage banks (MMB)	-0.0103 <sup>**</sup> (0.0052)	-0.0146 (0.0127)	-0.0239 (0.0260)	-0.0057 (0.0072)
Privately owned banks (POE)	0.0041 (0.0048)	-0.0138 (0.0105)	0.0118 (0.0233)	0.0116 <sup>*</sup> (0.0070)
Cooperative financial firms (CFF)	0.0234 <sup>***</sup> (0.0064)	-0.0028 (0.0117)	0.0289 (0.0251)	0.0362 <sup>***</sup> (0.0086)
Loan portfolio diversification (HHI)	0.0178 <sup>***</sup> (0.0037)	-0.0597 (0.0383)	0.0188 <sup>***</sup> (0.0037)	0.0161 <sup>***</sup> (0.0038)
Market expansion (HHI)	0.0100 <sup>***</sup> (0.0033)	0.0109 <sup>***</sup> (0.0033)	0.0345 (0.1017)	0.0099 <sup>***</sup> (0.0034)
Time trend	-0.0001 (0.0003)	0.0003 (0.0003)	-0.0001 (0.0003)	0.0020 <sup>*</sup> (0.0012)
Loan portfolio diversification × MMB		0.0578 (0.0394)		
Loan portfolio diversification × POE		0.0702 <sup>*</sup> (0.0385)		
Loan portfolio diversification × CFF		0.0851 <sup>**</sup> (0.0385)		
Market expansion × MMB			0.0198 (0.1048)	
Market expansion × POE			-0.0277 (0.1014)	
Market expansion × CFF			-0.0235 (0.1028)	
Time trend × MMB				-0.0012 (0.0013)
Time trend × POE				-0.0022 <sup>*</sup> (0.0012)
Time trend × CFF				-0.0029 <sup>**</sup> (0.0014)
Intercept	-0.1086 <sup>***</sup> (0.0341)	-0.1007 <sup>***</sup> (0.0333)	-0.1255 <sup>***</sup> (0.0399)	-0.1327 <sup>***</sup> (0.0347)
Wald test (chi2)	113.33 <sup>***</sup>	139.41 <sup>***</sup>	122.99 <sup>***</sup>	131.04 <sup>***</sup>
Adjusted $R^2$ (Unweighted)	0.2057	0.2230	0.2120	0.2052
Number of observations	335	335	335	335

Standard errors adjusted for heteroskedasticity are presented in brackets. a) Unweighted  $R^2$  is reported because the GLS transformation inflates the statistic from the regression (Greene, 2003). We obtain the unweighted  $R^2$  regressing the untransformed dependent variable on the predicted values using the coefficients from the weighted regression (GLS). Sample size = 335. Dependent variable: return on assets (ROA). Estimation method: feasible generalised least squares (FGLS). The omitted ownership structure variable is State owned banks. \*, \*\*, \*\*\* = Significant at the 0.10, 0.05, and 0.01 level, respectively.