

The Effect of Concentration and Efficiency of State Banking on Bank Competition in Sri Lanka

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Abstract : *The common criticism against state bank operations in most developing countries is their negative impact on the degree of bank competition of such economies. This study provides new and rather scarce evidence of effects of state bank concentration and efficiency on banking sector competition in Sri Lanka for the period starting from 1996 to 2010. Sri Lankan banking sector is highly concentrated around two state banks as per the concentration ratio, moderately efficient as per Data Envelope Curve analysis and moderately competitive as per the Pazer-Ross H statistics. Contradictory to the common criticism, the results of the main analysis found a positive effect suggesting state ownership of banks provide an indirect means of regulating the conduct of private banks and hence the level of competition. However, a negative effect of state bank efficiency found in this study reveal, in the short run, the lower efficiency of state banks encourages other banks to compete in the market. Thus, the findings of the study point out a need for continuous financial reforms, with proper monitoring mechanisms, to facilitate mixed oligopoly type of bank market in the Sri Lankan banking sector.*

Keywords: *banking sector, competition, efficiency, H statistic, state bank concentration*

I. Introduction

The traditional approach to competition has been to associate with more firms with more price competition and fewer firms with less price competitive behavior (this approach is also called 'structural approach'). This definition comes from a classic Industrial Organization argument, called the Structure-Conduct-Performance paradigm (SCP)¹, which assumes that there is a causal relationship running from the structure of the market to the firm's pricing behaviour, the firm's profits and degree of market power. The non-structural approaches² hypothesize that factors other than market structure (or the industry concentration) may affect competitive behaviour. This approach has been developed in the context of the New Empirical Industrial Organisation (NEIO) literature. The ambiguous results of the concentration approach suggest that the competitive behaviour of banks is not necessarily related to the number of banks in a market or to their concentration but to other factors such as entry-exit barriers and the general contestability of the market (Baumol et al. 1982; Rosse and Panzar, 1977; Panzar and Rosse, 1987). The most important advantage of non-structural approaches is that it does not assume that concentrated markets are not competitive, because contestability may depend on the extent of potential competition and not necessarily on market structure (Casu & Girardone, 2006). Thus, according to contestability literature, the structure is only one source of competition. The Sri Lankan banking sector has been characterized by a number of notable changes over the last two decades. Advances in technology, new types of dynamic bank firms, various products and services, financial liberalization, and the ongoing economic and regulatory integration have aimed at increasing the degree of competition and efficiency in the Sri Lankan banking sector. These have further affected the changes in the market structure of the banking sector. Theoretically, a lower level of concentration in the banking industry, by increasing competition and decreasing cost, has a positive impact on efficiency. One of the major objectives of the liberalization and deregulation process in Sri Lanka was to improve the competitiveness in the financial sector by allowing the private sector to take part in the financial sector.

However there is a common obstacle that can be observed in many developing countries. That is, banks in developing countries are competing in an environment where the financial infrastructure or the prerequisites for such competition is lacking. Consequently, the combined net result of these changes on financial market development and competition in emerging economies including Sri Lanka, is uncertain and insufficiently revealed in the existing literature. In light of these considerations, this paper focuses on the potential impact of state bank concentration and efficiency on the competitiveness of the banking sector of Sri Lanka.

¹ The Structure Conduct Performance (SCP) model dates back to the pioneering work of the Harvard economist Edward Mason, in the 1930s, and of his doctoral student Joseph Bain, in the 1950s.

² Non-structural approaches measure competition without using explicit information about the structure of the market. Instead, non-structural measures focus on obtaining estimates of market power from the observed behavior of banks

II. Commercial banking sector of sri lanka

At present, the major participant in the banking sector in Sri Lanka is the licensed banking sector, which comprises Licensed Commercial Banks (LCB) and Licensed Specialized Banks (LSB) which dominates the financial system. According to the statistics as at end December 2010, the LCBs dominated the financial system with a market share of 43 per cent of the entire financial system's assets and 64.8 percent of the banking sector's assets. Therefore, the health of the financial system depends to a larger extent on the soundness of the LCBs (Financial System Stability Review, 2010). As at end-December 2010, the banking sector comprised 22 LCBs and 9 LSBs. Based on the ownership, these are divided in to three major components namely state banks, domestic private banks and foreign banks. As stated in Financial System Stability Review (FSSR) reports, even though a large number of licensed banks exist in the country, the stability of the financial system is primarily dependent on the performance and financial strength of the six largest LCBs³ of which two are state commercial banks. These six banks, which are generally, referred to as the Systemically Important Banks (SIBs), represented 78% of the LCB sector assets and 65% of the total banking sector assets. In terms of deposits, the SIBs held a market share of 83% and 68% of LCB sector and banking sector deposits, respectively (FSSR, 2008). Currently the domestic private banks record the biggest market share of the industry. Until late 1990's two state banks accounted for more than 50 percent of the total commercial banking sector assets. The remaining 50 percent represented the assets of all other domestic and foreign banks. However after 2002, the assets of the state banks shrank and could reach a share of 45 percent in 2003 and 40 percent in 2007.

III. Literature review

Theoretically market structure considered as one factor that drives competitiveness in the banking sector. Traditionally, the degree of competitiveness is directly measured by using concentration indices. The common view holds that high concentration is a useful signal of an uncompetitive market. To the contrary, Claessens & Laeven's study (2003) find a statistically positive relationship between the competitiveness indicator and the banking system concentration variable, giving some evidence that more concentrated banking systems are more competitive. Thus, their study suggests that having a contestable system may be more important to assure competitiveness than a system with low concentration. However, findings of Demircukunt, Laeven, and Levine (2004), reveal that when controlling for bank-specific factors, concentration is positively and significantly linked with bank net interest margins. However this relationship breaks down, when regulatory restrictions on banks and macroeconomic stability are controlled. Therefore these results shed skeptical light on using national bank concentration measures to proxy for the competitive environment facing the banking industry.

One separate body of recent research interest focus on mixed oligopoly that exclusively studies competition between public and private firms. The basic idea in this strand of literature is that state ownership of banks provide an indirect means of regulating the conduct of private banks and hence the level of competition. There have been only few articles which examine the effect of competition between public and private banks on the level of competition in the whole banking market in an economy. Saha and Sensarma (2004) studied the competition between a private bank and a public bank and have demonstrated that the mixed approach can be useful, but they share a common limitation of focusing only on deposit competition and not default risk. This shortcoming was addressed in the Saha and Sensarma (2009), by focusing both deposit and loan markets. This study highlights that the welfare maximizing objective of the government can mitigate the default risk of the competition. For this, the authors used two models in one of which the government is a welfare maximizer, but also their profit orientation and managerial incentives of the private banks leading to partial privatization of the state owned bank. In the second model, the government is purely a welfare maximizer and the private bank does not offer managerial incentives. Their results show that if the risk of default is sufficiently high and there is limited liability, then the state owned bank tries to mitigate depositors' losses by mobilizing less deposits leading to contraction of aggregate deposit. These findings support the view that public-private bank interaction affects the level of competitiveness in the bank market.

IV. Methodology

The econometric analysis is carried out to see the effect of state bank concentration and efficiency on the level of competition. The effect of state bank concentration and efficiency also controlled for a *contestability* variable and interest rate prevail in the country. Therefore the model is developed as a multiple regression. The dependent variable of the model is the degree of competition measured as Panzar-Ross H statistics. The regression model is as follows:

$$H_t = \alpha_0 + \alpha_1 \text{StateCon}_t + \alpha_2 \text{Effstate}_t + \text{Contest}_t + \alpha_3 \text{RealInterest}_t \text{ ---- (Eq. 1)}$$

³ The six SIBs are; Bank of Ceylon, Peoples' Bank (state banks) and Hatton National Bank, Sampath Bank, Seylan Bank and The Commercial bank.

Concentration referred to the market share held by the largest producers in an industry, while competition referred to a company's ability to dictate prices. Although the two are linked, as Guzman (2000) highlights highly concentrated industries are not necessarily less competitive. Though concentration had been the traditional view of competition, studies done later on have found a close relationship between competition and concentration. Hence, State bank concentration (*StateCon*) was hypothesized to be negatively affected on the degree of bank competition. Further, the performance of state banks in Sri Lanka gives other banks a positive signal in the market. Therefore, assuming a positive effect on bank competition in Sri Lanka, state bank efficiency (*StateEff*) was used as another independent variable. The efficiency scores were calculated with non-parametric frontier methodology; data envelopment analysis (DEA). By taking this, the model developed in this study incorporates two state bank concentration ratio and efficiency of state banks as the main decisive variable. The Eq. (1) also incorporates two control variables. One is *Contestability*. Contestability analyses the factors that affect bank's ability to contest in the market. From among different proxies used to measure contestability, the growth rate of bank branches in the bank market was taken to indicate entry barriers. Contestability of the bank market is expected to positively affect the degree of bank competition. As the interest rate changes directly impact on the performance of commercial banking sector, the study incorporated annual real interest rates (*Realinterest*) in the country as the second control variable. The dependent variable of the study is H_t the average H-statistic for year t , based on individual bank data for the period 1996-2010, and α_0 is the year specific unobservable effect on bank competition in the country.

IV.1 Measuring Competition

Competition in the Sri Lankan banking sector is measured with Panzar-Rosse (1987) approach. Panzar and Rosse (1987) define a measure of competition, the *H statistics* as the sum of the elasticities of the reduced-form revenue function with respect to factor prices. According to them, this statistic can reflect both the structure and the conduct of the market to which the firm belongs; it represents the percentage variation of the equilibrium revenue derived from the unit percent increase in price of all factors used by the firm.

$$\log TR_{it} = \alpha + \beta_1 \log IPL_{it} + \beta_2 \log IPF_{it} + \beta_3 \log IPC_{it} + \lambda_1 \log TA_{it} + \lambda_2 \log NPL_{it} + \lambda_3 DV + \lambda_3 BR + e_{it} \quad \text{--- (Eq. 2)}$$

Where TR_{it} is the ratio of gross interest revenue to total assets (proxy for output price of loans), IPL_{it} is the ratio of personnel expenses to total assets (proxy for input price of labor), IPF_{it} is the ratio of interest expenses to total deposits (proxy for input price of deposits), and IPC_{it} is the ratio of other operating and administrative expenses to total assets (proxy for input price of equipment/fixed capital). Eq. (2) also includes a set of exogenous and bank-specific variables that may shift the revenue schedule. Specifically, TA_{it} (total assets) of the bank, non performing loan ratio (NPL) and number of branches were incorporated to control for potential effects of such variables on interest revenue. In addition, a dummy variable (DV) was included for foreign owned banks. Panzar and Rosse (1977), show that the sum of input price elasticities, $H = \sum_{i=1}^n \beta_i$ reflects the competitive structure of the market.

IV.11 Data and Data Sources

Since the purpose of the study is to investigate how state bank concentration affect on banking sector competition, both accounting data and macro level data were employed. In terms of bank types, the study considers only commercial banks and excluded saving banks from the sample. The study uses an extensive bank level set of panel data and macro data for the 15 years starting from 1996 to 2010. The sample covers 22 commercial banks. All other variables are annual values calculated by the author based on the annual reports of banks and obtained from Central Bank annual reports.

V. Results and Discussion

Before estimating the parameters for the above equations some dynamics in relation to independent variables has been illustrated in order to provide a general understanding about the behaviour of the variables in the context of Sri Lankan banks.

V.1 Dynamic behavior of state concentration efficiency and competition

Fig. 1 shows the dynamics of state bank concentration. Two state bank concentration had been significantly declining during the sample period. However it shows a little increase after year 2008.

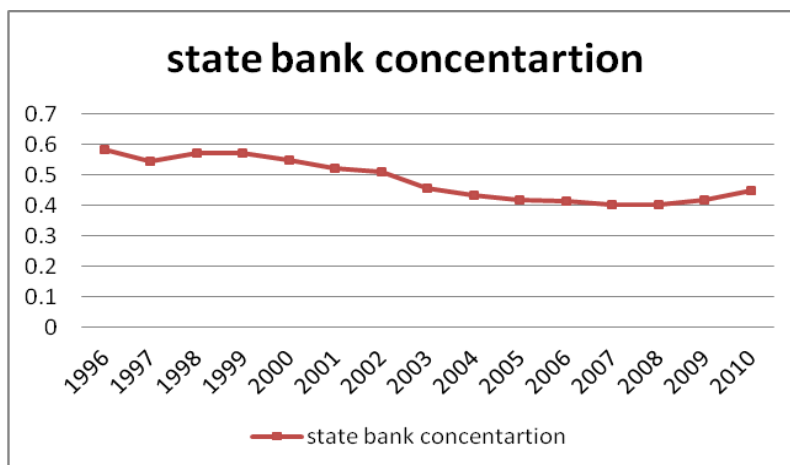


Figure 1

Time dynamics in bank market structure

Source: Calculations by the author based on annual reports of state banks

As a general phenomenon, it is not difficult to observe that, there is a decreasing trend in bank concentration over the sample time period. This pattern of behavior is gradual over the years 1998 to 2008. However, a slight increasing trend can be observed after 2008. The tougher competition faced by state banks in the presence of dynamic private banks in the market was perhaps the reason behind this particular trend. The sudden deviation in market structure after 2008, may also be an indication of the financial crisis that started with the collapse of one private bank in 2009.

As depicted in fig. 2, the efficiency level of state banks had improved during the period 2000-2006 and declined thereafter. This shows that compared to the best efficient bank in the year, state banks efficiency levels had been quite high and improving in the said period. However this has not been stable, and has started to decline thereafter.

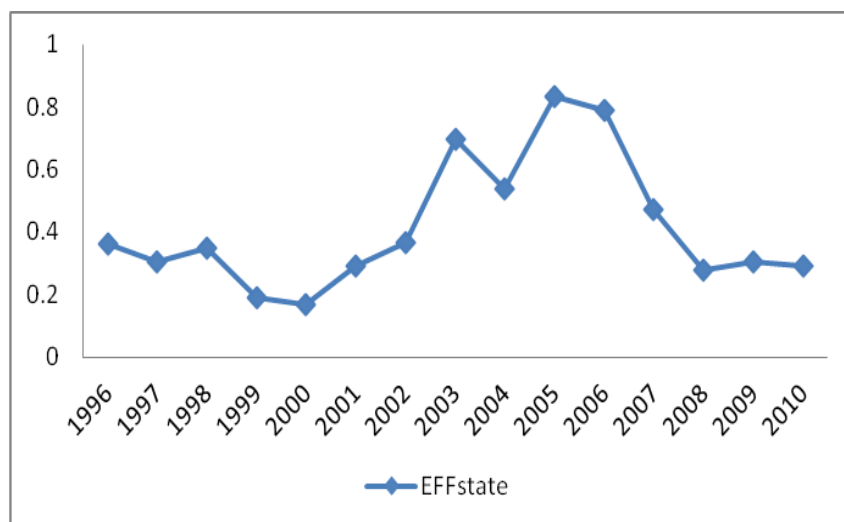


Figure 2

Time dynamics in Sate Bank Efficiency

Source: Calculations by the author based on annual reports of state banks

As per the results of the estimated reduced form revenue equation, the estimated H statistic is 0.55 for the sample period. This value does not lend support for a perfectly competitive banking market in Sri Lanka, as the estimated H statistic significantly differs from 1. This value is also significantly non-negative (closer to zero), thus offers no evidence for a monopoly in the banking market. The results suggest that for the observed period, the Sri Lankan banking sector is characterized by monopolistic competition according to the PR classification. The H statistic estimates over the stages move around 0.49 to 0.67 between 1996 and 2010 and do not have a persistent upward or downward trend. Rather it shows cyclical movements along the sample period. This particular pattern of competition in Sri Lankan banking industry can be further illustrated by using fig. 3.

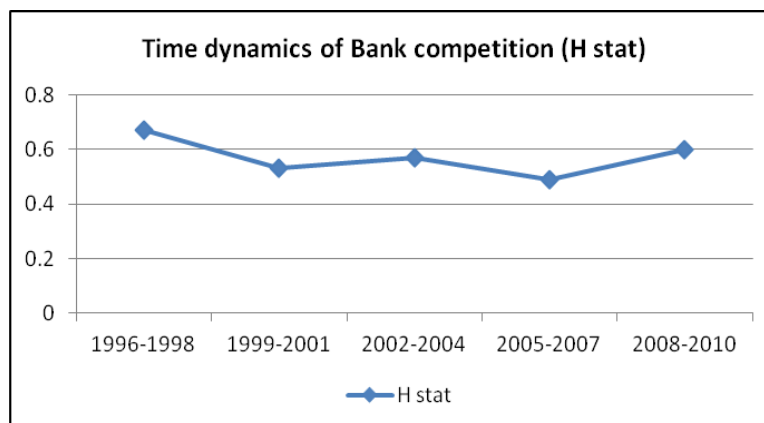


Figure 3

Trends in observed competition measure of Sri Lankan banks 1996-2010

Source: Calculations by the author

The period from 1996-1998 exhibits the highest level (0.67), but declines during 1999-2001 (0.53) and rises to an intermediate position during the period 2002-2004 (0.57). The H statistic reaches its minimum in 2005-2007, noteworthily, the H-statistic rises to an intermediate position (0.6) during the 2008-2010. Several striking features of the estimation outcome should be highlighted. First, according to the estimated annual H statistics, the degree of bank competition during the periods 1999 to 2001 and 2005 to 2007 had been low compared to the rest of the years, stating that the changes in bank input prices are not sufficient to explain the changes in bank revenue during the said periods. This indicates that changing input prices had minimal effect on bank revenue undermining competition during these two periods. It is perhaps the economic downturn in year 2000 and 2001 and its effect on financial markets are evidenced in this analysis. This evidence indicates that the level of economic development matters for banking sector competitiveness. Specifically, banks are less competitive with price stability, perhaps due to the fact that interest rates become an unreliable benchmark to price financial services. High interest rates during 1999-2001 could also have discouraged banks from competing in the market. Further financial crisis of the country in 2008 and the recovery from the crisis thereafter can clearly be observed through the competitive behavior analysed in the figure. Further, economic development after civil war could have impacted on increased competition after 2009. Hence, evidence found in this analysis shows that competition in Sri Lankan banking sector is sensitive with respect to macro level changes in the economy.

The nexus between state bank concentration, efficiency and competition

In order to identify how state bank concentration and efficiency affect on the degree of bank competition in Sri Lanka, the Eq. (1) was analysed with variables explained in section IV. The results of the initial analysis are given in table 1.

Table 1: Regression results - Eq (1)

Dependent Variable	Banking Sector Competition (H-stat)
Constant	-0.6048
StateCon	0.2107**
EffState	-0.1915**
Contest	1.1208***
Realinterest	-1.9975***
H stat(t-1)	-0.4754
Adjusted R-squared	0.64
F Statistics	55.82**
DW stat	1.67

As a start, it is useful to note that both concentration and efficiency of state banks correlations are statistically significant. More interestingly, the study found a positive correlation between state bank concentration ratio and the degree of bank competition in the country. This relationship is statistically significant at 5% level. This suggests that more concentrated bank environments are more competitive. This is quite contradictory to the common wisdom that says concentrated markets are less competitive. This can happen through the competitive pressure of private banks (both domestic and foreign) against the state banks. Banking market of Sri Lanka is very small. When this small banking market is highly concentrated around the two state banks, other non-state banks in the market need to extensively compete to capture the market. On the other hand, state banks too need to react to this competition in order to protect their market share. Thus, competition

among all banks to capture a small market results in a competitive climate in the banking sector. Therefore the findings of the study suggest that the *H*-statistic (bank competition) and the bank concentration are two variables that cover different concepts. Thus, findings of the study confirm the predictions in the New Empirical Industrial Organization (NEIO) literature that the degree of competition is not necessarily related to market structure. Further, this evidence supports the findings of Saha and Sensarma (2009).

The efficiency of the state bank was also tested to assess its validity as a determinant of bank competition. The found coefficient was statistically significant. The negative sign of *Effstate* says that the degree of competition is higher when the state bank efficiency is lower. This may be true as the analysis focus on the short run effect of bank competition. The private banks always take the lower level of efficiency of the state banks as a competitive advantage. Therefore, in the short run the lower efficiency of state banks encourages other banks to compete in the market. However in the long run this effect can be scaled down when the state banks too improve their efficiency.

The effect of contestability and interest rate were controlled with the proxies bank branch expansion and annual real interest rate of the country. Contestability (branch expansion) was found as statistically correlated with the degree of bank competition. This relationship suggests that branch expansion improves the contestability in the market and this in turn improves the competitive climate in the banking sector. This result supports traditional industrial organization literature; more banks more competition. When new branches are established, the competition between existing banks and new banks in a geographical area increased. The positive effect of branch expansion may particularly be true as the Sri Lankan bank market is small. Real interest rate is included in the model to test any changes effect on the competitive conduct of the banking sector. Real Interest rate measured with annual average Treasury bill rate deflated by inflation rate. The interest rate play an important task in the call money market to facilitate liquidity management in the economy. Thus, if there is excess liquidity in the market, the Central Bank decides an increase Treasury Bill rate to mop-up the surplus money as a safeguard against inflationary pressure on the economy. This process in the short run affects the behavior of the bank. The coefficient found in relation to real interest rate in the analysis is negative suggesting a lower bank competition with higher real interest rate and *vice versa*. When the interest rate is higher banks feel more comfortable to invest their excess cash as they get a higher return in secure funds. However, this would affect the banks' liquidity level to be kept at the minimum. This in turn discourages banks to compete in the market. This particular cause of bank competition was evident in this empirical analysis. There is a significant degree of persistence in the competition (*H* stat) variable, since the average value of the first-order autocorrelation is high. Hence, the lagged dependent variable was included as an explanatory variable. However this is not statistically significant.

V.III Robustness of the Model

The estimation procedure generated heteroscedasticity consistent estimates by employing White's correction in order to keep the estimators efficient. The last rows in table 1 give more information as to how the explanatory power the model has been built up. The adjusted R^2 s showed in the first row says that the specified model of the study generally explains 64% of the time series variations in the degree of commercial bank competition in Sri Lanka. The found *F* statistics are significant at 5% level, indicating high collective power of the variables included in the model in explaining changes in bank competition over time. Durbin-Watson stat for the sample period should be within the range of 0.34 in lower level and 2.73 in upper level at 1% significance level in order to be free from autocorrelation. The calculated Durbin-Watson stat is within this range confirming its robustness from serial auto correlation.

VI. Conclusion

This paper analysed the effect of state bank concentration and efficiency on competitiveness in the Sri Lankan banking sector. By applying the new empirical industrial organization approach, the study finds that Sri Lankan banking market is moderately competitive. One of the important observations noted in this analysis was the strong evidence to support the difference between competition and concentration. No evidence was found to prove that state bank concentration has undermined bank competition in Sri Lanka. Instead a positive effect was found suggesting state bank concentration promotes competitive behavior of other banks in the short run. This finding rejects the common criticism of negative impact of bank market concentration on competition and can be taken as an important policy implication. A more competitive climate can be created in the operations of these banks by attracting and retaining their market shares, so that the other banks in the market are encouraged to be more competitive. These results imply that competition in the banking sector needs to be further enhanced. The degree of competition in the country is limited when compared to some of the emerging economies. The statistically proven concentration-competition nexus in this study suggests an environment which fosters bank competition in Sri Lanka. Empirical results of this study suggest that liberalization policies have exerted considerable effect on the environment in which banks are competing with each other. Thus the findings of the

study point out the need for continuous financial reforms with proper monitoring mechanisms to facilitate competition in the banking sector. The Central Bank intervention in liquidity management is also a need to be handled cautiously, as the higher interest rate was identified as a negative cause of bank competition.

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