



Journal of

SOCIAL SCIENCES



Market structure and profit performance of Banks in Sierra Leone

Joss

Ferdinand Ahiakpor¹ & Bartholomew David²

Abstract

The study examines the effects of market structure on profitability in the Sierra Leone banking industry. There are two competing hypotheses—the traditional structure–conduct–performance (SCP) hypothesis and the efficiency hypothesis (EH). Using pooled and quarterly data for the period 2006-2011, this study tests the validity of these two hypotheses. In general, the overall results of the study have been mixed. However, capital to asset ratio and expenses to asset ratio are found to influence their performance. But for definitive policy purposes, the impact of the banking structure needs to be explored further.

Keywords: Bank performance, Market structure, Sierra Leone

Introduction

There has been a rich and insightful debate in industrial organization about the welfare and profitability effects regarding the number and size distribution of firms in an industry. While many complex facets of this fundamental issue remain partly unsettled, the basic compromise at work is well-known, though still a major source of controversy both among academics and anti-trust practitioners. This relationship between performance and market structure has generated two competing hypotheses: the Market Structure-Conduct-Performance (SCP) Hypothesis and the Efficiency Structure Hypothesis.

The Market Structure-Conduct-Performance (SCP) hypothesis is the traditional paradigm of assessing firm behaviour or performance given the market structure. The SCP hypothesis (following Bain, 1951) seeks to test the hypothesis that observable structural characteristics of a market determine the behaviour of firms within that market, and that the behaviour of firms within a market given structural characteristics, determines measurable aspects of market performance. In this context, market structure refers to the number and size distribution of firms. The theoretical implication of the SCP hypothesis is that given the pricing behaviour expected under monopoly or oligopoly (concentrated market), the average profit returns realized by firms in these concentrated markets tend to be significantly higher than that of firms in less concentrated markets, meaning prices will be less favourable to consumers because of non-competitive behaviour that arises in such markets.

The Efficient Structure Hypothesis, on the other hand, maintains that firm-specific efficiencies arising from superior management, use of new technology, etc., enable some firms to increase their market share at the expense of other relatively inefficient firms, leading to market concentration. The implicit assumption is that the differing efficiencies among firms lead to unequal market shares and high levels of concentration, and are causally due to factors that reduce costs. The leading firms will earn above-average profits even if they charge prices at the level of secondary firms.

In the context of the banking firm, the number of banks in relation to the size of the banking market, as measured by an index of concentration, has been singled out to denote market structure. Concentration is defined as the extent to which most of the market's output is produced by a few firms in the industry. The definition of concentration in terms of output poses empirical problems in the banking industry because of its multi-product nature, although the main products are loan-making and deposit-taking services (Morris, 1985).

The Sierra Leonean banking sector has been and is still oligopolistic with an average number of twenty three thousand one hundred (23,100) depositors per bank. From independence in 1961 up to 1973, Sierra Leone had only three commercial banks and a development bank. Between 1980 to the early 90's,

¹ Corresponding Author, Department of Economics, University of Cape Coast, Cape Coast, Ghana. Email: fahiakpor@yahoo.com

² African Foundation for Development, Sierra Leone

the two foreign commercial banks (Standard Chartered and Barclays Bank) dominated the banking industry, with the Sierra Leone Commercial Bank, Meridian Biao Bank, International Bank of Trade and Investment, and the National Development Bank providing fringe competition. From 1991, the civil war between the government and rebel forces led to the disruption in the financial system, as most of the financial institutions ceased operations on the heels of the intensification of the war.

However, with relative political stability and the conduct of elections in 2002, the financial system was resuscitated and is undergoing the transition to a functioning post- conflict system. At present, the banking sector comprises the Bank of Sierra Leone (the Central Bank), seven commercial banks and three community banks. There are also a number of Non Bank Financial Institutions (NBFI's) which have emerged to perform specialized functions and complement the intermediation role of the commercial banks.

The commercial banking system is currently dominated by the Standard Chartered Bank Limited (foreign owned), government-owned Sierra Leone Commercial Bank and government-controlled Rokel Commercial Bank (which was taken over from Barclays Bank). Collectively, these three banks account for 92.3% of the total resource base (Total Assets) of the banking system. Sierra Leone Commercial Bank accounts for 31.2% of total banking deposits, while Rokel Commercial Bank and Standard Chartered Bank accounts for 30.5% and 26.4% respectively. The banking system has over the years suffered from liquidity and a large number of non-performing and underperforming loans. This was partly attributed to the general macroeconomic downturn, government interference, inadequate legislation and supervision, undercapitalization and lax management policies.

The proper assessment of the Structure and Performance of institutions has been a debated issue and remains, perhaps, one of the most important questions in applied industrial economics. Even though there have been a number of studies on industrial structure and performance (Sami et al., 2011; Seelantha, 2010; Chirwa, 2001; Mohieldin, 2001; & House, 1973).

Despite the various study on market structure and performance, the results has been mixed. In addition, to the best of our knowledge there has not been any known empirical study on in the Sierra Leonean banking sector despite glaring evidence of three leading commercial banks accounting for 88.1% of total banking deposits.

The aim of this research is to address gaps in the literature on the link between concentration and profitability in the banking sector. The rest of the paper is structured as follows: Section 2 briefly presents literature review of related works. Section 3 presents methodology, estimation techniques and the source of data. Section 4 presents and discusses the empirical results. Finally, section 5 supplies some concluding comments.

Related works

Various attempts have been made to evaluate the empirical relevance of market structure on performance in the banking industry. Civelek and Al-Alami (1991) in investigating the role of the market concentration in determining bank profitability in the Jordanian banking system rightly note that the banking industry is very important to the economy and empirical evidence on the SCP relationship provides a strong rationale for banking regulatory and supervisory authorities to introduce, modify and monitor public policy measures designed to enhance social welfare. They examined the relationship between concentration and profitability using cross-section data generated by the full sample of the sixteen commercial banks in Jordan. Using OLS method, they tested this relationship for a five consecutive year's period from 1984 -1988. They reported that market concentration power impacted performance for the years 1984, 1985 and 1986 although such impact was not detected in the results obtained in 1987 and 1988. The reason for the difference in the latter years was interpreted as that 'there has been a change in the behaviour of the banks regarding the composition of their loan portfolios'. This meant that, banks with large market concentration power may have inclined to rely on less profitable (possibly less risky) loans. Civelek and Al-Alami therefore concluded that there was some empirical evidence in support of the structure – performance hypothesis within the Jordanian commercial banking system.

Denizer's (1997) study confirmed the findings of Civelek and Al-Alami (1991) that market structure had a significant impact on performance in the Turkish banking industry. Using cross sectional

time series data on all deposit money banks in Turkey from 1986 to 1992, he concluded that there existed a collusive price leadership type of arrangement in the Turkish banking market.

An empirical study in Sub-Saharan Africa, conducted by Chirwa (2001) also showed support for the market performance hypothesis. Using time series data for Malawi from 1970 to 1994, he tested the collusion and efficient market hypotheses on commercial banks examining the behaviour of the dominant banks in the system. He estimated a Lin-log function for the dominant commercial banks in Malawi and found evidence to support collusion in the banking industry.

Also, Agu (1992) investigated the relationship between economic performance and market structure, policy and demand variables for the Nigeria banking system from 1970 to 1981. According to him, although there are other objectives that bank management may pursue, he iterated that profitability performance goal surpasses others if the bank is to be viable in the short run. He identified market structure variables as comprising total assets, deposit concentration ratio and number of bank offices, while policies variables included time plus savings deposits to total deposit ratio and loans to total deposit ratio. Demand variables were proxied by per capita income. He concluded that market structure as measured by the number of bank offices was found to be statistically significantly correlated with bank profitability although market structure measured by concentration ratio had no significant and statistical association with bank profitability. He however mentioned that the significant statistical association of the number of bank branches with profitability notwithstanding, on the balance, gave a weak correlation between market structure and performance.

However, other studies have reported results that supported the efficiency hypothesis, a notable is Smirlock's (1985). He argued that there is no relationship between concentration and profitability, but rather between bank market share (proxying for efficiency) and bank profitability. He argued that following Demsetz (1973), Peltzman (1977) and Brozen (1982), it is hypothesized that concentration was not a random event but rather as a result of firms with superior efficiency obtaining larger market shares. Hence market shares and profits will be correlated but there will be no casual relation between concentration and profits.

Using data for the years 1973 and 1978 for over 2,700 unit state banks operating in Kansas City, Smirlock (1985) estimated a cross-sectional profit equation that included both market share and concentration as independent variables and found out that there was no evidence that market concentration enabled banks to earned monopoly rents due to collusion.

Mohieldin (2001) in another study used the S-P model to test the relevance of the S-P paradigm in the Egyptian banking context using pooled cross section time series data of 47 commercial banks for the period 1980 - 1998. He formulated a linear profit function that included concentration ratio as a proxy for market structure and market share for market efficiency, plus a number of control variables specific to the banks and the market as a whole. He observed that the concentration ratio was insignificant while the market share was positive and significant. He therefore gave support to the efficiency hypothesis that bank specific efficiencies resulted in both concentrated market and higher profits.

Maudos (1998) tested the efficiency structure hypothesis versus the collusion hypothesis using direct measures of efficiency (based on three alternative distributional assumption of efficiency: half-normal, normal-truncate and exponential), obtained through the estimation of a stochastic cost frontier instead of the normal market share proxy used in many studies. He indicated that market share is an inadequate proxy for efficiency. His results obtained within the Spanish banking industry over the period 1990-1993 using a pooled sample of 335 observations accepted the modified efficiency structure hypothesis, suggesting that the bank regulatory decisions based on concern for their impact on changes in concentration may be inappropriate and should focus instead on bank efficiency.

Providing a critic to the S-P and Efficiency hypotheses, some researchers have however obtained an expanded structural model in which the S-P and Market efficiency hypotheses were expanded Berger (1995), Shepherd (1982). They argued that the true effects of market structure on performance cannot be captured by just using the market power and efficiency hypotheses. They claimed that expanding these two hypotheses give a better picture as to the relationship between structure and performance. They expanded the SCP hypothesis by adding the relative market hypothesis (RMP) which asserts that only firms with large

market shares and well differentiated products are able to exercise market power in pricing these products and earn supernormal profits.

According to Baumol (1982), when entry and exit are free, efficient incumbent monopolists and oligopolies may in fact be able to prevent entry only by offering to consumers the benefits which perfect competition would otherwise bring. In other words, given the contestability of the market, it is possible to have outcomes approximating those of perfect competition even though the number of actual competitors is quite small. Hence, he argued that there is no basis for assessing a significant value to the market concentration variable in determining profitability. In conclusion, the overall evidence from empirical studies has not been consistent, with some in favour of market power while others support efficiency.

Model specification

Earlier studies analyzing the relationship between market structure and profitability used linear regression techniques with the overall results being indisputably inconclusive. This inconclusiveness in the existing body of research of market structure and performance in the banking industry led Clark (1986) to argue that bank profits might be jointly related to other variables since banks are considered as multi-product in nature and proposed the use of a simultaneous equation. Civelek and Al-Alami (1991) however postulated that there exists no strong theoretical or empirical consensus that makes a particular specification significantly superior to others. In this study, we therefore will remain within the conventionally established linear regression model with regard to the model specification.

As observed in the literature, Chirwa (2001) used the market structure–profitability model to test the traditional SCP and the Efficient Market Hypotheses for commercial banks in Malawi. Chirwa estimated a Lin-log Profit function using a single-equation multiple time series regression analysis. Other studies (Weiss, 1974; Denizer, 1997 and Mohieldin, 2001) however have used a linear relationship to estimate the profit function of banks using cross-sectional data.

This study examines the behaviour of three commercial banks (the dominant banks) in the banking industry in Sierra Leone, which may be pursuing joint profit maximization due to common ownership structure with regard to two of the commercial banks (Sierra Leone Commercial Bank and Rokel Commercial Bank) on one hand and their dominant role together with another bank (Standard Chartered Bank) in a common banking association on the other hand. This argument is in conformity with what Gilbert (1984) called Mutual forbearance. Mutual forbearance according to Gilbert is when few banks which are in direct competition with each other agree to limit their rivalry in the market. These banks would thus pursue joint profit maximization as they dominate the market. The robustness of the results on the dominant banks would be tested by examining the behaviour of two fringe banks.

To determine the performance of the banking industry, using profit performance as the indicator, we specified the linear profit function as in the work of Smirlock (1985), Denizer (1997) and Mohieldin (2001).

$$\pi_{it} = \alpha_1 + \alpha_2 cr_{it} + \alpha_3 ms_{it} + \alpha_4 ta_{it} + \alpha_5 ca_{it} + \alpha_6 la_{it} + \alpha_7 dt_{it} + \alpha_8 oea_{it} + \alpha_9 mdgr_{it} + \alpha_i + \varepsilon_i \quad (1)$$

Where t present the time period, i the dominants commercial banks, π commercial banks profit measured by return on asset (roa), return on equity (roe) and return on capital (roc), cr market concentration ratio (the share of the banks deposit accounted for by the three largest banks), ms market share of each of the three dominant banks, ta commercial bank assets, ca capital to asset ratio of commercial banks, la loan to asset ratio of commercial bank, dt demand deposit to total deposit ratio of commercial banks, oea operation expense to total asset ratio of commercial banks, $mdgr$ market deposit growth rate for the banking industry, α capture all unobserved, time invariant factors that affect profit, ε idiosyncratic error, representing factors that change over time and affect profit. This study used market concentration ratios and shares as it gives the firm a great bargaining power.

Estimation technique

From equation (1), we estimate the collusion model and efficient market model for the dominant banks using the fixed effect. The fixed effect technique is adopted because the paper analysis the impact of variable that varies over time. This is done by decomposing the model above into three equations. The first equation tests the collusion hypothesis by eliminating the market share variable. In the second equation we introduce market share and eliminate the concentration measure and test the efficient market hypothesis. And in the third equation we then introduce both concentration measure and market share.

A coefficient combination of $\alpha_2 > 0$ and $\alpha_3 = 0$ implies that market share does not affect bank rents and that rents reflected in higher profitability are monopoly rents that result from market concentration. To account for Demsetz’ (1973) efficiency hypothesis that in a concentrated industry only large but not small banks earn monopoly rent, we repeat the process above for small (fringe) banks in the Sierra Leonean banking sector. If $\alpha_2 > 0$ and $\alpha_3 = 0$ for fringe banks, then the collusion hypothesis is supported. But if $\alpha_2 = 0$ and $\alpha_3 > 0$, then the efficiency hypothesis is supported. It is, of course, possible that both α_2 and α_3 may be positive and significant, indicating that both factors are operative simultaneously.

Data

The data, which is a monthly data and involves all seven commercial banks, covers the period from March 2006 to December 2011. For this analysis, the sample contains 210 observations for the dominant banks and 140 observations for fringe banks. The main data sources are from the balance sheets and profit & loss accounts of the commercial banks and Non bank financial institutions. Other sources are the Bank of Sierra Leone’s monthly and quarterly reports. Apart from the First Discount House, all the other non bank deposit institutions were excluded in the regression analysis due in part to the paucity of data.

Empirical result and discussion

Table 1a and Table 1b present summary statistics of the variables used in the regression analysis for both dominant and fringe banks. For the dominant banks, ROE and ROC show a mean profitability of 38.5% and 55.2% respectively. The standard deviation and maximum rates are also high. The average profitability measured by ROA is 7.0% with a standard deviation of about half the mean rate (3.1%). Similarly, Roe and Roc for the fringe banks recorded mean profits of 19.1% and 19.4% respectively. The profitability measured by ROA show a mean rate of 4.2% with standard deviation of 2.7%.

Table 1a: summary statistics of dominants banks

Variables	Mean	SD	Max	Min
Roa	7.02	3.09	14.2	1
Roe	38.54	16.57	72.77	6.42
Roc	55.24	30.69	129.72	6.34
Cr	90.73	1.71	93.42	87.19
Ms	19.44	2.68	28.75	4.71
Ta	84.08 ¹	30.66	152.5	38.68
Ca	15.01	4.51	24.36	8.97
La	17.61	3.9	27.91	12.76
Dt	67.94	1.467	70.5	64.98
0ea	4.96	2.55	15.76	0.73
Mdgr	1.63	7.03	29.41	-25.42

¹Billions of Leones

Table 1b: summary statistics of fringe banks

Variables	Mean	SD	Max	Min
Roa	4.195	2.73	10.69	-0.23
Roe	19.14	12.63	50.26	1.31
roc	19.36	16.44	57.81	-9.96
Cr	93.83	7.59	104.57	79.77
Ms	46.91	3.8	52.28	39.89
Ta	15.76 ²	8.05	5.56	49.11
Ca	23.97	9.87	50.83	4.99
La	22.97	9.84	39.29	6.54
Dt	72.3	10.85	85.58	37.38
Oea	8.54	6.55	35.22	0.63
Mdgr	1.627	7.03	29.41	-25.42

Results for dominant banks

The regression results of the profit-structure model equation 1 are reported in Tables 2, 3 and 4 (only relevant partial results are presented). In general, the explanatory power of the regressions measured by the R² which ranged between 12% and 65% is good, taking into consideration that the sample consists of both cross-sectional and time components.

Three equations are estimated and the results of the first equation are reported in Table 2. This equation tests the collusion hypothesis. This is done by estimating equation 1 without the market share (*ms*) variable, but with the market structure (*cr*) variable.

Table 2: Static analytical regression results

Independent variable	Dependent variable		
	Roa	Roe	Roc
Cr	1.0091 (5.26)	7.9219 (2.69)	11.393 (6.92)
	0	0.008	0
R ²	0.51	0.4532	0.6349
F-Statistics	29.73	24.05	49.69
Prob>F	0	0.004	0.0000

NB: t-statistics in parenthesis

The coefficient of the three bank concentration ratio (*cr*) has the expected positive sign and is statistically significant at the 5% level for all the three measures of profit. This implies support for the traditional collusion hypothesis at the initial stage. Market structure is related to the different measures of profits. Therefore like earlier studies, we can conclude at this stage that market structure is an important determinant of bank profitability in the Sierra Leone banking sector.

In the next stage, the model is estimated with the market share variable but without the market structure variable. This is done in order to test the efficiency hypothesis. A positive and significant coefficient of the market share variable which is a proxy for efficiency would imply support for this hypothesis. The results of the regression are presented in Table 3.

Table 3: Static analytical regression results

Independent variable	Dependent variable		
	Roa	Roe	Roc
	0.7085	0.0982	1.5017
Cr	(1.17)	(0.11)	(2.81)
	0.244	0.912	0.005
R ²	0.446	0.125	0.5648
F-Statistics	22.99	4.07	37.07
Prob>F	0	0.0014	0

NB: t-statistics in parenthesis

The market share variable has the expected sign for all the profit measures but is insignificant for two of the profit measures (*roe* and *roa*). It is, however, significant for the profit measure at 1% level. Based on this evidence, one might be led to conclude that bank-specific effects resulting in high market shares exist and that the efficiency hypothesis is valid. To verify which hypothesis has a greater impact on profitability in the banking sector in Sierra Leone, both hypotheses are accounted for simultaneously in the model.

The validity of both the collusion hypothesis and the efficiency hypothesis in explaining bank profitability is thus tested by incorporating both the market share variable (*ms*) and the market structure variable (*cr*) in the model. The collusion hypothesis suggests, that banks having significant market positions in highly concentrated market, will tend to restrict output, charge higher prices and earn higher rates of returns (monopoly rents). So there is a positive relationship between market concentration and profitability. Therefore a condition of $\alpha_2 > 0$ and $\alpha_3 = 0$ will mean that rents reflected in higher profitability are monopoly rents that result from market concentration. On the other hand, according to the efficiency hypothesis, there is a positive relationship between market share, arising from bank-specific efficiencies, and profits. Hence, if $\alpha_2 = 0$ and $\alpha_3 > 0$, then it is possible to infer that bank profitability is directly linked to market share, proxying efficiency, and banks controlling large portions of deposits are normally efficient than others and earn rents due to their efficiency. Such a finding will also imply that market concentration does not enable banks to earn supernormal profits. As stated earlier, it is, of course, possible that both α_2 and α_3 may be positive and significant, indicating that both factors are operative simultaneously.

Table 4: Static analytical regression results

Independent variable	Dependent variable		
	Roa	Roe	Roc
Cr	1.046 (5.13) 0	8.7919 (2.82) 0.005	10.9239 (6.25) 0
Ms	-0.0329 (-0.54) 0.587	-0.7739 (-0.83) 0.405	0.4179 (0.8) 0.422
Ta	0.00957 (0.93) 0.356	0.03799 (0.24) 0.811	0.0958 (1.08) 0.281
Ca	0.0768 (2.00) 0.046	0.4717 (0.80) 0.423	-2.599 (-7.89) 0
La	-0.0597 (-1.13) 0.259	0.2251 (0.28) 0.781	-0.16855 (-0.37) 0.71
Dt	0.00506 (1.111) 0.268	-0.00753 (0.11) 0.914	0.06779 (1.73) 0.084
Oea	0.8027 (12.62) 0	3.969 (4.07) 0	5.939 (10.88) 0
Mdgr	-0.0352 (-1.24) 0.217	-0.4051 (-0.93) 0.352	-0.11558 (-0.47) 0.636
Cons	-92.092 (4.48) 0.000	-766.002 (-2.63) 0.009	-958.7329 (-5.82) 0.000
R ²	0.5107	0.1272	0.6361
F-Statistics	25.96	3.63	43.48
Prob>F	0.0000	0.0006	0.0000

NB: t-statistics in parenthesis

From the result as presented in Table 4, it is clear that the efficiency hypothesis is not supported as the coefficients of the market share variable have the wrong sign in all but one of the profit measures. Reinforcing this claim is the fact that the coefficients of the market share variable are not even marginally significant for all the profit measures. On the other hand, the market structure variable^(cr) is still significant at the 1% level with the expected positive sign for all the three profit measures.

These results allow us to conclude in favour of the validity of the collusion hypothesis for dominant banks in the Sierra Leone banking sector since the market structure variable^(cr) is positive and significant by itself, and is still significant and positive when the market share variable is introduced. While the market share variable^(ms) is not significant by itself as well as with the market structure variable. These results are

in conformity to those obtained by Chirwa (2001); Denizer (1997); and Civelek and Al-Alami (1991) that dominant banks enjoyed profits primarily because of their market power.

Results for fringe banks

To further test the robustness of the results which support the collusion hypothesis, the three dominant banks are dropped from the data set and the profit equation (1) is re-estimated for the next two small banks (fringe banks). This is done in order to assess the influence of market structure on the behaviour of smaller (fringe) banks following Demsetz (1973). According to Demsetz, if a positive relationship between market concentration and profitability reflects the exercise of market power, it should affect the rate of return of large and small firms in the same way. He emphasized that if firms have identical cost structure, then the profits earned should be independent of the particular sizes adopted by those firms to achieve low cost production. He therefore argued that if dominant firms earn higher profits in concentrated markets but fringe firms do not, then a correlation between profitability and market concentration reflects the superior efficiency of large firms. If this study thus finds that both the dominant banks and fringe banks enjoys profits, then collusion is present and the market structure hypothesis is supported. If, on the other hand, dominant banks achieve monopoly rents but fringe banks do not benefit from this concentration, then the efficiency hypothesis cannot be rejected.

Table 5: Static analytical regression results

Independent Variable	Dependent variable		
	Roa	Roe	Roc
Cr	-0.1047 (-1.12) 0.264	-0.9683 (-2.72) 0.007	-1.6308 (-3.57) 0.001

NB: t-statistics in parenthesis

From the result in Table 5, the market structure variable ^(cr) has the wrong sign for all the three profit measures although significant for two of them (ROE & ROC). This result contravenes earlier conclusions for the dominant banks in which ^(cr) was highly significant and positive by itself. Table 5 gives the result in which only the market share variable was considered. The result shows that market share comes in with a strong positive effect with its coefficient significant for all the profit measures at the 1% level. The result in Table 6 presents the results which both variables are utilized simultaneously in the same equation.

Table 6: Static analytical regression results

Independent Variable	Dependent variable		
	Roa	Roe	Roc
Ms	0.21883 (5.24) 0.000	1.0083 (6.46) 0.000	1.3486 (6.65) 0.000

NB: t-statistics in parenthesis

The results are in direct contrast to that obtained for the dominant banks. In this case, the market share variable is positive and significant at 1% level for all the profit measures. The coefficient of the market structure variable still has the wrong sign although marginally significant at 10% level for the *roe* and 1% level for *roc* profit measures. This implies that fringe banks do not benefit from concentration and that they are profitable because of their efficiency. The monopoly rent benefited by the three dominant banks are not filtered to fringe banks; whatever profit is realized by these fringe banks can thus be associated to better management strategy which reduces cost and enhanced efficiency.

With these findings, the efficiency school would argue that since only large banks but not small banks benefit from concentration, then the correlation between profitability and market concentration reflects the superior efficiency of dominant banks. Hence the efficiency hypothesis should not be rejected. These results are consistent with those obtained by Mohieldin (2001) for banks in the Egyptian banking

sector and Smirlock (1985) for banks in Kansas City. But proponents of the collusion hypothesis would argue that as long as market concentration increases the profits of dominant banks and not fringe banks, then the collusion hypothesis is valid. In fact, they argued that the contention that concentration and resulting collusion raises the profits of fringe banks is not part of the market power interpretation of the collusion hypothesis.

This mixed result, as those pointed out in the survey by Byeongyong, Choi and Weiss, (2005) and Gilbert (1984) that makes it difficult to give a clear dichotomy as to what hypothesis is operative in the banking system in Sierra Leone for the period of study. Studies like that of Leach (1992) obtained similar results and concluded in favour of the market efficiency hypothesis. While Collins and Preston (1968) with also similar results concluded in favour of the collusion hypothesis.

With regard to the existence of the collusive price leadership, the strong and positive influence of the market share variable^(ms) over the market structure variable^(cr) indicates the absence of such a type of arrangement in the Sierra Leonean banking sector.

Conclusion

The main objective of this study has been to examine the effect of bank market structure on the profitability performance in Sierra Leone. This relationship between market structure and performance was investigated using panel data regression analysis of both the dominant and fringe banks' profitability. We have examined the two main hypotheses- whether collusion or efficiency is the more important determinant of commercial banks' profitability.

The overall result of the study has been mixed. The interpretation of the results of the study has been inconclusive as to whether the collusive hypothesis or the efficiency hypothesis is operative in the Sierra Leonean banking sector. The results show that market power is evident for dominant banks but not for fringe banks. In addition, capital to asset ratio and operating expenses to asset ratio is some of the key determinants of profit performance.

The policy implications from the study would differ depending on which hypothesis is considered. Therefore, based on the mixed results obtained from the study for the Sierra Leonean banking sector, further research is needed with an extended time period on the interaction between profits, market share and concentration.

References

- Agu, C.C. (1992). Analysis of the determinants of the Nigerian banking systems' profits and profitability performance. *Savings and Development*, 16(4), 353–369.
- Baumol, W. (1982). Contestable markets: An uprising in the theory of industry structure. *American Economic Review*, 72(1), 1–15.
- Berger, A.N. (1995). The profit-structure relationship in banking - Tests of market power and efficient-structure hypotheses. *Journal of Money, Credit and Banking*, 27(2), 404-431.
- Brozen, Yale. (1971). Bain's concentration and rates of return revisited. *Journal of Law and Economics*, 14, 351-69.
- Byeongyong, P. C. & Weiss, M.A. (2005). An empirical investigation of market structure, efficiency, and performance in property-liability insurance. *Journal of Risk & Insurance*, 72(4), 635-73.
- Chirwa, E. T. W. (2001), Market structure, liberalization and performance in the Malawian banking industry. *AERC Research paper 108*.
- Civelek, M. M., & Al-Alami, M. W. (1991). An empirical investigation of the concentration–profitability relationship in the Jordanian banking system. *Savings and Development*, 15(3), 247–259.
- Clark, J.A. (1986), Single-equation, multiple regression methodology: Is it an appropriate methodology for the structure–performance relationship in banking. *Journal of Monetary Economics*, 18(3), 259–312.
- Collins, N. R & Preston, L. E. (1968). *Concentration and price-cost margins in manufacturing industries*. Berkeley: University of California Press.
- Demsetz, H. (1973). Industry structure, market rivalry and public policy. *Journal of Law and Economics*, 16(1), 1–19.
- Denizer, C. (1997).The effects of financial liberalization and new bank entry on market structure and competition in Turkey. *Policy Research Working Papers*, 183. The World Bank.
- Gilbert, R.A. (1984). Bank market structure and competition: A survey. *Journal of Money, Credit and Banking*, 16(4), 617–45.
- House, W. J. (1973).*Market structure and industrial performance, the case of Kenya*. Oxford Economic Papers New series (J).
- Leach, D.F. (1992). Concentration and profits in South Africa: Monopoly or efficiency. *The South African Journal of Economics*, 60(2), 82-92.
- Maudos, J. (1998).Market structure and performance in Spanish banking using a direct measure of efficiency. *Applied Financial Economics*, 8, 191–200.
- Mohieldin, M. (2001).On bank market structure and competition in Egypt. *The Egyptian Center for Economic Studies*.
- Morris, C. (1985).Banking market structure in Tenth District, 1973–83. *Economic Review of Federal Reserve Bank of Kansas City*, 18–31.
- Peltzman, S. (1977).The gains and losses from industrial concentration". *Journal of Law and Economics*, 20, 229–263.
- Mensi, S., & Zouari, A. (2011). Banking industry, market structure and efficiency: The revisited model to intermediary hypotheses. *International Journal of Economics and Research*, 2(1), 2229-615.
- Seelanatha, L. (2010). Market structure, efficiency and performance of banking industry in Sri Lanka. *Banks and Bank System*, 5(1), 20-31.
- Shepherd, W. (1982). Economies of scale and monopoly profits. In J. V. Craven (Ed.), *Industrial organization, antitrust, and public policy*. Boston: Kluwer Nijhoff.
- Smirlock, M. (1985). Evidence on the (non)relationship between concentration and profitability in banking. *Journal of Money, Credit and Banking*, 17(1), 69–83.
- Weiss, L. (1974). The concentration-profits relationship and antitrust. In: H. Goldschmid, M. Mann & J. F. Weston (Eds.), *Industrial concentration: The new learning* (pp.184-233) Boston: Brown and Company.