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Market competition in the Ethiopia commercial banking industry: an application of the traditional Structure-Conduct-Performance (SCP)

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Abstract
The paper aim is to find the competition level based on the relationship between market structure and performance of the Ethiopian banking sector using financial data from commercial banks in Ethiopia. To investigate the impact of market structure on return, the author used structure-conduct – performance (SCP) and efficiency profitability (E-P) hypothesis. To measure the two hypothesis concentration taken to represent market structure and a market share variable to capture the effect of Market conduct on bank performance, and the two accounting measures return on Assets and return on Equity uses to represent banks performance. We have also used control variables to capture market specific characteristics such as bank size, market size, and risk to owners, liquidity measure, market risk, and market growth. We have taken a sample of 16 commercial banks incorporated in Ethiopia to examine the above hypotheses, using panel data for a period of 7 years from year 2010 - 2016. Regression analysis result indicated that banks profitability negligibly affected by concentration of the banking sector in Ethiopia. In light of these results, we conclude that there is no relationship between profitability and concentration. On the other hand the results of market share (MS) which is used for efficient structure hypothesis explain a positive relationship with profitability at 10% significant level only when ROE is used that indicate, there is a positive relationship between competition and profitability in the Ethiopian commercial banks. Consequently, the research suggests the need for improvement in bank capitalization, bank size, service product innovation and effective liquidity management for the Ethiopian banking industry. The commercial bank of Ethiopia is still enjoying the state of monopoly. The market trend shows that this state will continue for a longer period unless the private commercial banks developed new competitions strategies.

Keywords: structure, conduct, performance, market share, concentration, assets, capitalization

1. Introduction

Banking sector in any country in the financial system plays a significant role in influencing the economy through its contributions towards improving the stability and efficiency of allocating and utilizing of fund. Many researchers have used the Structure – conduct – performance paradigm to look in to the relationship between the market structure and competitive structure with the performance of the banking sectors. By Implication the researchers extend the result to justify services sector competition effect on performance of the banking industry in the world as a whole.

The relationship between performance (price or profitability) and market structure (market share and concentration) has been intensively investigated in various industries in numerous studies, especially in relation to the banking industry. This popularity may due to the specialty of the banking market which plays a crucial role in the economy and is subject to intense regulations.

Literature on bank performance mainly focus on the traditional organizational theory that incite market structure has a positive with the return of the banks. The empirical studies have explanations for this widely accepted positive relationship between market structure and market share on firms performance. To measure market power relation with performance there are two testable hypotheses to dig out the market competitions. The first one is traditional structure - Conduct - performance and efficiency hypothesis. These approaches have been controversial for the scientific and academics community for decades and no resolution has been reached as to how performance is affected. The former argues market structure or concentration determines firms conduct (collusion and economic pricing) which finally affects firm's performance (Rate of Return or profitability). Whereas the later would argue market competitiveness results for the bank to record performance in turn uplift market structure which implies bank efficiency has a positive relation with performance and finally increases concentration. It farther expanded by saying bank competition has a direct relation with bank profitability.

The traditional SCP hypothesis had been more favorable during the 1980s when there were fewer competitions. Early studies also support is facts the hypothesis best fit in measuring market power relations with performance. SCP in a more concentrated banking market banks drive higher profit. These notions justified as when there is few service firms in the market the collusion get higher. The firms might work together in pricing strategies and the business as a whole to get the chips of bargaining power over their clients to benefit

more than ethically and morally accepted business. Collusion is easier as the number of firms and market share of the firms played in the industry decreased. Abnormal profit, loss of social wale fare should follow effective collusions of banks. Farther these will drag down potential economic growth because among many strategies the bank sets higher loans rates and lower deposit rates which definitely favor to get more profit.

Studies like Peltzamn (1977) brozen (1983) challenges the market structural hypothesis which focus on relationship between concentration and performance, rather he came up with an alternative hypothesis called as efficiency hypothesis. As per his studies profit difference cannot be explained directly from collusion hypothesis or concentration in the market would rather because of the marginal changes of bank efficiencies. Efficiency hypothesis argued that various ion of efficiency among the institution creates differences in profitability. Which means bank profitability depends up on the level of efficiency of the firms in the industry. Therefore difference in competitiveness is the underlying driving force for market share and profitability rather than market concentration.

These efficiency achieved through resource utilizations, skilled man power, superior management, advanced production and information technologies have reduced over all operating cost in turn achieve a higher returns. cost efficiency by itself do nothing rather the firm get very competitive on pricing reduce borrowing rate and increase relatively deposit rate by doing so increase the market shares and becoming more profitable. Thus, the profits and market share is the result of efficiency, not of a higher level of concentration (collusion).

Though the two hypothesis different view as to which come first and next to increase profitability, both are considered as traditional structural approaches to measures performances. The efficiency hypothesis considers as an alternative version of the SCP. The other hypothesis which is related with the efficiency hypothesis is market power hypothesis (RMP. It treats individual firm market share (instead of whole market collusion) as the cause of inefficiency. Therefore the difference between the efficiency hypothesis and the RMP hypothesis is whether efficient performance determines high market share or vice versa.

Smirlock (1985) [33] summarizes the efficiency hypothesis difference with collusion hypothesis. He says the reason for concentration of firms in the market is the comparative advantages gain through cost minimization, services production help the banks to drive higher market shares and that leads finally to concentrations. Therefore, the basic message of efficiency hypothesis is that leading firms' efficiency leads to increased market share thus higher concentration and is positively correlated with higher performance.

Despite disagreement between the two hypotheses on as to how the relationship created between profitability and market structure, the final result actually supports the same goals. Both believe there is a positive relation between market structure and performance but they differ in the aspect of how market power can be obtained in the first place. The efficiency hypothesis pointed out firm concentration is the result of market share obtained through superior efficiency. Whereas the traditional SCP hypothesis takes market power as exogenous, which is derived from market concentration?

Public policy and regulations in particular to commercial banks considers the application of these two hypotheses beside the sameness of the logic and theory of the traditional organization. If we apply the two methods it creates differences implication on the structural regulations and supervisory and prudential directives regulation and like on antitrust and merger policies. If one of the hypotheses is true it has a different implication of each of the policy and regulations. For instant If SCP hypothesis held correct which means concentration has a strong relation with performance antitrust policy become more relevant to protect clients from being charges a higher borrowing rate and low deposit rate in the case of the banking business. Otherwise if efficiency hypothesis held true antitrust policy increase the cost of the business so that not accepted by the advocates. Similarly in the case of structural regulation which deal with banking market and performance through regulating new entrants, exciters, price or commission fees charged and interest rate ceiling, if SCP held true, the regulation become more useful on the other hand supporter of efficiency hypothesis unsavory because of the higher social and legal costs expected from structural regulations.

The financial system of Ethiopia grown rapidly though it is categorized into as underdeveloped economy; some of the reason for is there is no stock exchange and foreign banks in the country, and the system remains isolated from the effects of globalization while policy makers fear that liberalization will lead to loss of control over the economy. The government controls interest rates and sets them below the high inflation rate. Corruption, though strictly sanctioned, remains a concern. The National Bank of Ethiopia is the country's central bank. The state owned Commercial Bank of Ethiopia is the largest bank in Ethiopia and controls 60% of the assets of the entire banking system

Based on the most recently data, Commercial Bank of Ethiopia (CBE) mobilizes more than 60 percent of total bank deposits, bank loans and foreign exchange if we have seen closely this figure actually it was almost a pure monopoly few years back before the recently opened private commercial banks. Now the total number of banks reached 18 out of which 2 are government owned and the rest is private. Among the 16 private banks before 2005 there were only 7 private banks in the country and the total share of the private bank increased to 40%. The fact changed and the market share of the public banks sharply decreased. This shows that the private bank competitiveness has an upward trend in the past including in the study period. Beside the growth of private banks still the Ethiopian banking sector believed to be concentrated and as a recent phenomenon the competitiveness also show some improvement. Coase (1936) says profit maximizing banks have the same aim as any other firms. So this question best answered by traditional models. In his classical analysis argued that that the firm acted as an alternative to market transactions as a way of organizing by commands rather than depending on market forces. The existence structures of the traditional banks which intermediate between borrowers, lenders and payment

commission fees based services to its customers fit well with the coasy theory. Sinkey (1886) in the microeconomics theory stated that the structure of the market influence the conduct and behavior of individual firms. Which means market concentrations decreases the cost of collusion between firms and results in abnormal profits. As per coasy theory this study uses structural industrial theory to investigate market structure relation with performance.

Though the Banking sector appears to be the major player in the Ethiopian financial market holding more than 95% of the gross financial asset (NBE report, 2012/13), the current banking system of Ethiopia is highly regulated and protected from foreign competition. The banking activity is entirely owned by domestic banks and two forms of ownership structures are prevalent, that is, either banks are fully owned by private owners or else banks are fully owned by government (NBE report, 2016). In terms of market share, the commercial banking sector is still under the dominance of state owned banks. The number of state owned commercial banks is few; nonetheless, they control more than 70% of the total assets of the entire banking system (NBE report, 2016). Although the state owned banks dominated and are still dominating the market, they do appear to have been facing a competitive environment since the issuance of the banking act allowed the participation of private banks in the industry (Deribie, 2012) [16]. However, the competition level might not be significant as the new banks generally have a relatively small market share (Lelissa, 2007) [22, 24]. The share of private banks in the asset base is limited to 30%. In addition, the persistent presence of entry barriers even after the financial liberalization has weakened the competition among the domestic banks (Bezabeh and Desta, 2014) [10].

The banking system is still characterized by high regulation and control for a number of reasons. Some of the reasons include protecting depositors' fund, ensuring safety and stability of the banking system, protecting safety of banks by limiting credit to a single borrower and limiting or encouraging a particular kind of lending because of expected impact on the economy (Semu, 2010). In addition, policy measures from the government interfere in the decision making process of private commercial banks which might have implication on efficiency and performance. For instance, Ethiopian private banks are required to allocate 27 per cent of their new lending to the government with an interest rate of just 3 per cent (NBE Directive No.MFA / NBE BILLS / 001 / 2011). This action of the government interfering in the operation of the banking industry by drafting restrictive regulations drag down the performance of commercial banks especially private owned banks because of their small size. The shire size of lending to government based on the above NBE directives oblige the banks to incur unnecessary costs for the given market structure.

The traditional structure – conduct -performance (SCP) hypothesis is used in the literature to analyze firm performance given the structure of the market. The SCP or collusion hypothesis follows the eminent works of Bain (1951) which postulates that market structure influences conduct of firms through prices or investment policies and this in turn translates into performance (Ye. et.al; 2012). This hypothesis asserts that the setting of prices that are less favorable to consumers (lower deposit rates and higher loan rates) in more concentrated market enable them to enjoy high profitable performance (Berger, 1995) [9]. This study, therefore, principally intends to systematically identify and measure the effects of concentration on the performance of the Ethiopian banking sector using pane l (longitudinal) data from 1990-2015 and 18 commercial banks.

These articles contribute to the growing body of empirical research in Ethiopia by looking in to the relationship between the market structure and performance of the commercial banking sectors. Indeed the number of private commercial banks in recent periods increase competition the banking business in fact already took a lion share of the market from the state owned commercial bank of Ethiopia which has been dominated the banking industry for decades. In order to do that we tested the validity of the SCP hypothesis in Ethiopian commercial banking market during 2010-2016.

1.1 Objectives of Study

The aim of this study is to find out whether there is relationship between competition and performance of commercial banks in Ethiopia. A closer look at the Ethiopian banking industry reveals emerging trends. The Ethiopian banking industry under gone reforms expand private banks by consolidating their position by increasing paid up capital and expanding branch network.

Besides the dominance of public banks relatively the financial system is stable and bank's performance has become increasingly market-based as the private banks increased. Thus, competition is contemporary phenomena that may constitute a major determinant of bank performance in Ethiopia today, contrary to the earlier period with a total state control of the banking industry.

In order to assess the role of competition and concentration in bank performance empirically, we have undertaken the structural approach to measure banking market in Ethiopia. This approach is relevant as it evaluates the structural features of the market, and links competition to performance. Our main goal is to investigate the relationship between competition and concentration with bank performance.

The primary objectives of the present study are delineated below:

- To find out the relationship between competition and bank performance in Ethiopia commercial banking industry
- Identifying the driving force behind relationship between the bank performance and market structure in Ethiopian banking industry.
- To determines other market-specific factors that affect banking profitability.

2. Literature Review

2.1 Theoretical literature

In the banking industry exercising market power by setting prices is a concern to policy makers and research communities. Many empirical researches examined the relationship between market structure of banks and market performance. Discussion on SCP literature of studies in banking sector is organized as follows. Two main research streams can be distinguished: the market structure paradigm and the efficiency paradigm. The first paradigm reviews the

development of the SCP model over time, based on different specifications. The second considers the studies that empirically apply the method. Then we discuss some recent development and methodological issues involved in testing relationship between market structure and bank performance and we will focus on the empirical literatures in banking sector which apply the methodology proposed by Berger (1995) [9].

Mason (1937) and Bain (1956) formulated a framework for the first paradigm by empirical analysis of the effect of market structure on industry performance called the Structure-Conduct-Performance (SCP) model. The central hypothesis of the framework is that observable structural characteristics of a market determine the behavior of firms within that market, and the behavior of firms within a market determines measurable market performance (Bain, 1951). In short, SCP paradigm assumes that market structure would determine firm conduct which would determine performance (Bain, 1956).

The SCP hypothesis which states the positive association between market concentration and performance has been challenged by the efficiency hypothesis. Thus, the major difference between the two sub-hypotheses under the structure performance paradigm is that the SCP focuses on the overall concentration of the market, while the RMP stresses the individual market share. Although both hypotheses have different emphasis, they indicate that the market structure (or market power) is the underlying driving force behind the profitability. An alternative hypothesis which emerges from criticism of the structure performance hypothesis is the efficient structure (ES) hypothesis. Demsetz (1973) and Peltzman (1977) first challenged the structure performance hypothesis and argued that a positive relationship between profit and market concentration stems not from market power, but from the greater efficiency of firms with a larger market share, which then produces both higher concentration and greater profitability. If one controls for efficiency, the link between profitability and market structure variables will become insignificant and thus economically meaningless. Therefore, under the efficiency hypothesis, efficiency drives both profit and market concentration.

Thus, the driving force behind the process of gaining a large market share, and in turn higher concentration, is the efficiency of the firm. Equally, the most efficient firms will gain market share and earn economic profits. As the rise of the efficiency hypothesis, the innovation of the second method has been developed by adding one more independent variable, market share, as a proxy for efficiency. As mentioned before, the inclusion of market share variable in the SCP paradigm actually test relative market power hypothesis according to Berger's classification.

Therefore Shepherd (1982) found out not all market participants in the concentrated market can benefit and earn higher profits. He asserted that only firms with large market shares and well-differentiated products are able to exercise market power and make supernormal profits, which is referred to the Relative-Market-Power hypothesis (RMP).

More efficient firms have lower costs, which enable them to gain bigger market share and higher profits and in turn leads to greater concentration in the market. Firms that operate more efficiently may adopt two different strategies to achieve higher profits. The first alternative is to maximize their profits by maintaining existing levels of output, but setting a higher price. The second alternative is to maximize their profits by reducing prices and expanding their operations, which may be achieved either through internal growth or by acquiring less efficient counterparts in the market (external growth). As a consequence, gaining market share by efficient firms is the driving force behind the process of market concentration.

Larger firms can explore scale economies and obtain lower unit costs. Thus, according to the ES hypotheses, a positive correlation between concentration and profitability does not necessarily indicate a causal economic relationship, but could be spurious. Although the two competing broad categories of hypotheses (structure performance and efficiency structure) have a very different understanding of the direction of causality between market structure and performance, they indeed reflect the same positive relationship between market power and profitability. They just differ in the aspect of how market power can be obtained in the first place. That is, the structure performance hypothesis takes market power as exogenous, which is derived from market concentration or market share, and the direction of causality runs from the market structure of an industry to firm profitability through firm behavior such as collusion or pricing strategy. By contrast, the market structure is not exogenously determined under the efficiency hypothesis, but rather that it is the result of the superior efficiency. The efficiency hypothesis takes firm-specific efficiency as given; the market power is acquired by maintaining or improving such efficiency.

Under this hypothesis, we would see causality running from an individual firm’s efficiency to profitability via market share, as more efficient firms will be able to increase their market shares, resulting in higher concentration. Hence, the efficiency hypothesis claims that greater market concentration is not necessarily a consequence of the collusive behavior of firms but a consequence of the firm's enhanced efficiency. The relationship between firm performance and market structure is not only empirically interesting; it also has profound policy implications. The two hypotheses suggest different implications for merger and antitrust policy as well as regulatory work.

In conclusion if the structure performance hypothesis is favored, the enlarged market share and increased market concentration will enable firms to set prices less favorable to consumer. So antitrust policy and regulatory action for preventing accumulation of market power would be necessary. However, if the evidence supports the efficiency hypothesis, mergers and acquisitions that are motivated by greater efficiency should be encouraged, which should increase consumer and producer surplus. Thus, advocates of the structure performance hypotheses believe antitrust and regulatory policy is socially beneficial (lower unit cost, more favorable price and greater output), while the efficient structure hypotheses supporters consider it is socially costly. As a consequence, given that the banking system affects economic development and growth as well as poverty alleviation, it is important to identify the policy which is conducive to its efficient operation.

2.2 Empirical Review

In this section, we only focus on the empirical literatures that adopted the second method. This approach which tests the two competing hypotheses: the SCP hypothesis and efficiency hypothesis, has been applied extensively in different industries under various economic environment. In the banking sector, the SCP framework has been widely used to evaluate the possible link between market concentration and profits but the conclusions drawn from such studies have been mixed. Most studies focus on the US banking market found that greater concentration does not lead to higher profits and favour the efficiency hypothesis. While others shed light on banking industry in other countries mainly European countries supported the traditional SCP hypothesis.

The research studied by Smirlock (1985) [33] on the relationship between market structure and profitability and he found out no significant relation exist between them. Rather the banks gain market power from the relationship between market share and bank rate of return. He justifies this happened because there is high government restrictive control regulations and the concentrated resources generate low earning to the banks. Whereas the bank performance increased by the result of superior efficiency that explained by the large market share. In conclusion he said there is a casual relation between market share and profits but there will be no relation between market concentration and profitability.

Smirlock pointed out the banking industry market powers come from not from concentration would rather the efficiency hypothesis held positive and performance not driven by concentration or the size of banks rather achieving the goals of the firm with an increase of overall efficiencies. The banks should develop strategies of retrenching to use existing resources more efficiently to run a successful business so that monopoly on the asset wise do not assure the banks to monopolize the profits in the market. The author views these findings as support evidence for efficient hypothesis over the structural hypothesis as a description of banking markets.

A similar research undertaken employing a similar model (but exclude the interaction term) to test more than 6300 unit banks located in 30 states of the US in 1984 by Smirlock (1984) [34], Evanoff and Fortier (1988) [13]. They find support for the efficient structure hypothesis and limited support for the traditional SCP hypothesis. The implication of the competing hypotheses may actually be complementary theories only tries to find the source or cause of the performance of the banking industry. Their findings add support to the efficiency hypothesis and propose possible future research is necessary to determine the source of the efficiency.

Unlike USA banking sector European banking sector is more inclined to structural hypothesis than efficiency (Molyneux and Forbes, 1995) [27]. They examined the market structure and performance in 18 European countries for the four years period 1986-89 and tested the two hypotheses S-C-P and E-S, using pooled and annual data. He suggests that if the SCP paradigm is found evident in European markets, would focus on structural regulation and antitrust policy to closely control look in to the banking market structure in order to increase competition and improve quality of bank performance. If the efficiency hypothesis would have been found evident, it shouldn't have been restrictive enough to control concentration rather more focus on supervising regulations and so on.

Forbes uses the return on assets (ROA) and equity as the bank performance parameter. The independent variables include both market specific and firm-specific variables. Ten-firm concentration ratio (CR10) is used as a measure of market structure and market share measure (MS) to capture firm efficiency. A number of control variables are included to account for other risk, cost, size and ownership characteristics. In conclusion the European banking industry supports the traditional SCP approaches because the ability of banks to form collusions relatively easy to monopolize the banking business and increase profitability.

The market power and profitability also investigated for Malawi banking sector using time series data for the period 1970 to 1994 by Chirwa (2003) [12]. He uses time-series techniques of co integration and error-correction methods to test the collusion hypothesis. In the research he tries to examine the long term relationship between concentration and profit in the banking industries. He found out the result for the existence of between the two variables and Malawi banking market performance significantly affected by the size of the banks. This implies as per chirwa description Malawi's banking run by few state owned banks. The result also indicates the industry structure heavily affected the performance of the Malawi banking industry.

The relationship between commercial bank profits and concentration is positive and its coefficient is statistically significant at the 5 percent level in all specifications. He concludes that concentration, capital-asset ratio, loan-asset ratio, assets, demand deposits-deposits ratio, market deposits and market growth, have a long-run relationship with profitability in commercial banks. The collusion hypothesis is strongly supported by the positive and significant relationship between commercial bank profitability and concentration.

Three different stochastic measures of efficiency are used by Maudos (1998) [26] to analyze the relationship between the market structure and performance within the Spanish banking industry. The Spanish banking study over the period between 1990-93 using modified efficient structure hypothesis has been found out that efficiency are significant positive relation with profitability whereas market concentration plays nothing for the performance of the banking sectors. The author rejects the traditional collusion hypothesis.

These results contradict those reached by Molyneux *et al*, (1994) [28], due to the fact that those authors used market share as a proxy for efficiency. But, he uses a direct measure of efficiency obtained through the estimate of a stochastic cost frontier and market share is not used as a proxy for efficiency.

The same research under taken in Saudi banking sector by Ahmed and khababa (1999) [2], the paper aim to study the causal link between market power and profitability collecting secondary financial accounts for 11 commercial banks from the year 1987 to 1992. They use concentration ratios and regression model to investigate the problem. The regression model applied on repeatedly applied with and without total deposit (TD) in the model which represent the size of the banks. The results from the three models show that the business risk and bank size are the main variables which determine banks profitability.

However, Lloyd-Williams and Molyneux (1994) [28] present a similar analysis, and find support for the traditional SCP hypothesis with respect to the Spanish banking industry for the period 1968-1988. The empirical results suggest that concentration in the Spanish banking market has lowered the cost of collusion between firms and resulted in higher than normal profits for all market participants. This results contrast markedly with those works on the US banking industry which has generally more favorable to the efficiency hypothesis.

Molyneux and Forbes (1995) [27] firstly apply this type of study for the whole European banking market. Their results strongly support the traditional SCP hypothesis as an explanation for the performance of European banks.

The study made by Katib (1998) [21] examined the SCP theories in the Malaysian banking industry. Concentration ratios used in five level such as CR1, CR2, CR3, CR5, and HHI to represent the market structure applied on secondary audited financial data on sample of 20 commercial banks over the period from 1989 to 1996. The result shows efficiency hypothesis rejected on the other hand the finding from the analysis indicates concentration has a causal relationship with the performance of the Malaysian commercial banking industry. The research made by Anthony (2000) [1] expanded the investigations by testing the validity of three hypotheses like traditional structural hypothesis, efficiency hypothesis and quite life hypothesis for Taiwan's banking market over the period from the year 1986 to 1999. The examination undertaken in the time internal before and after the Taiwan banking liberalization policy (revision of the banking act) at 1991; Prior to 1991, their results do not support either the SCP or the efficiency hypothesis for Taiwan's banking industry. It implies the presence of a regulation-induced quiet life type of market structure for this period. The results for the period after 1991 tend to support the competing efficiency hypothesis.

Another unique study focus on the examination of the Dutch market power is studied by Bos J.W.B. (2004) [7]. He investigated the market power by employing three tests, namely traditional SCP model, a simple Cournot model and the modified SCP with efficiency measure though its impact moderately significant impact on performance. The test results favor SCP over quite life and efficiency hypothesis. The empirical tests provide evidence in favour of the SCP hypothesis.

Study in south Eastern European countries by Athanasoglou *et al* (2005) that applies structure – conduct – performance approaches to evaluate the relationship between profitability and market structure for the period between 1998 up to 2002 based on audited financial statement collected from each banks under investigations. He develops a model for profitability function includes explanatory variables from a set of bank specific and industry related environment. Still the result support that concentration is positive related with profitability which provides evidence in support of the SCP hypothesis. In addition Athanasoglou *et al* (2008) [3, 4, 5] expanded the study and study again the SCP framework to a panel of Greek banks covering period 1985-2001. Beside firm and industry specific factors the author includes macroeconomic variables of bank profitability in the empirical model. However, no evidence is found in support of the SCP hypothesis, as the effect of concentration is insignificant.

A paper in Bangladesh banking sector studied by Samad (2008) [31, 32] perform similar analysis in for the period 1999-2002. The results of this study support the efficiency hypothesis as an explanation for bank performance in Bangladesh.

3. Methodology

Structure Conduct Performance (SCP) model was the pioneering work of the Harvard economist Edwards in the 1973s and his doctoral student Joe S. Bain in the 1950s. Originally used by the US government in crafting antitrust policy, the model gained popularity among corporate strategists when Michael Porter 1980 used it as an analytic tool for businesses striving to compete within a market. The model's original form depicts the influence of an industry's structure (for example, the growth of demand and barriers to entry) on the conduct of producers (pricing, for example) and the performance of both the industry.

This approach allows companies to consider the influence of their own conduct on an industry's structure and, ultimately, on their own performance and competitiveness. Many financial institutions use the revised model to "play through" various scenarios that might affect them, to gain an understanding of what's happening in the banking industry, and to develop their strategies. The seemingly timeless dynamic SCP framework is useful across regions and industries.

3.1 SCP Model Constructions

The traditional SCP and efficiency hypothesis can be tested by estimating the following equation (Weiss, 1974), Simirlock (1985) and Lloyd-Williams *et al*. (1994) [25].

$$P_{it} = \alpha + \beta 1 CONit + \beta_2 MS_{it} + \sum \beta_n Z_{it} + \varepsilon_{it}$$

Where

p_{it} is performance measurement (ROE or ROA), CON_{it} is a measure of market structure (usually a concentration measure), MS_{it} is market share of individual banks, Z_{it} is a vector of control variables which affect bank's performance and ε_{it} is the stochastic error term. The equation provides the straight forward distinguish between two hypotheses. The traditional SCP hypothesis is favored if $\beta 1>0$ and $\beta 2 = 0$; which implies that market share does not affect firm's profitability and the profitability is the result of concentrated market. Whereas, the efficiency hypothesis can be verified by finding $\beta 1 = 0$ and $\beta_2>0$, which implies that more efficient firms with larger market share can earn higher profits than their rivals. Thus, $\beta_1>0$ and $\beta 2 = 0$ supports SCP and $\beta 1= 0$ and $\beta 2 > 0$ supports efficiency hypothesis.

3.2 SCP Model specification for this study

The complete equation we use to empirically test the two hypotheses for Ethiopian commercial banks is shown below:

$$ROA_{it}\ (ROE_{it}) = \alpha + \beta 1 CONt + \beta_2 MS_{it} + \beta_3 TA_{it} + \beta_4\ (E/TA_{it}) + \beta_5\ (TL/TA_{it}) + \beta_6\ (TL/TD_{it}) + \beta_7\ (LLP/TL_{it}) + \beta_8\ (OE/TR_{it}) + \beta_9\ OWN_1 + \beta_{10}\ OWN_2 + \varepsilon_{it}$$

Where

ROA_{it}=return on assets=net income/total assets

ROE_{it}=return on equity=net income/total equity

MS_{it} =market share of i^{th} banks based on total assets
CON_t= HHI =ΣMS_{it}^2
TA_{it}=total assets
E/TA_{it}=total equity/total assets
TL/TA_{it}= total loans/total assets
TL/TD_{it}=total loans/total deposits
LLP/TL_{it}=loan loss provisions/total loans
OE/TR_{it}=total operating expense/total revenue
OWN_1=ownership dummy for state owned banks
OWN_2=ownership dummy for joint equity banks
ε_{it}= error term

3.3 Fixed effect and random effect model

The SCP model can be estimated using fixed effect and the random effect model based on the panel data set that combines both time series and cross sections but the best model has to be selected by validating using Hausman tests

$$y_{it} = X_{it}' \beta + \varepsilon_{it}$$

$$\varepsilon_{it} = v_{it} + u_{it}$$

In the Fixed Effects model, FEM, the u_{it} are treated as n constants specific to each unit of observation. The panel linear model (plm) estimator gives the fixed effect and βFE is always consistent but not efficient.

$$y_{it} = \alpha_i + X_{it}'\beta + v_{it}$$

In the Random Effects model, REM, the u_i are treated as independently distributed random variables with $u_i$iid (μ, σ_u^2). The General Least Square (GLS) estimator gives the random effect, and$_{\beta RE \text{ is}}$ consistent and efficient if E ($u_i|x_{it}$)=0.

$$y_{it} = X_{it}'\beta + (v_{it} + u_i)$$

In order to choose between the effects we carry out Hausman test to check whether REM is better than the FEM:

H_0: $\beta_{FE} - \beta_{RE} = 0$
H_1: $\beta_{FE} - \beta_{RE} \neq 0$

3.4 Variables specifications

The proxy use to measure performance of the firms takes two forms in the studies of SCP. One is the price based proxy for bank performance. Rate of prices computed based on certain operational product and service is considered to find the proxy's. some of the example may be depends upon the authors justifications he might chooses interest on loan divided by total loan, ratios of interest on deposit for total deposit and so on. The second option taken performance proxy might be profit; it can be computed taken in the form of Return on Asset (ROA) and return on equity (ROE), Return on capitalization. But still now no agreement has been achieved to which measures are superior. Most of the recent studies of the SCP framework in banking have focused on the use of profitability as performance measures.

Using profit alleviate wage control problem since information on prices and costs are embodied in data on profits. Furthermore, individual prices of particular products or services can be quite misleading, particularly in the banking industry. As noted by Molyneux and Forbes (1995) [27], banking is a multiproduct business and banks are often involved in cross subsidization among products and services. Therefore, profitability figures are generally viewed as more appropriate as gains and losses of all products and services are integrated into one single value. Hence, in our study, bank profit is utilized as performance measure.

Heggestad (1979) [20] and Tu and Chen (2000) [35], though we are using return on asset (ROA) and Return on equity (ROE) as proxy to bank performance; criticize on the use of return on assets as representative for performance. The financial statements lack adjustments reflecting their reasonable market values. Further, large proportion of real assets including in total assets is not relevant for profit generation process, so it is better to use ROE, which shows the return to shareholders on their equity and it is the most closely to what owners seek to maximize. However, banks with lower leverage (higher equity) will generally report higher ROA but lower ROE. Since an analysis of ROE disregards the risks associated with high leverage and financial leverage is often determined by regulation, the ROE is not an appropriate measure for profits, as argued by Athanasoglou *et al* (2008) [3, 4, 5]. Due to ROA and ROE having their own benefits and drawbacks, here, we use both ROA and ROE as profit measure. Moreover, in order to avoid negative ROA or ROE figures in some years, we use (1+ROA) and (1+ROE).

The Herfindahl-Hirschman index (HHI) is chosen as a measure of market concentration, and specific firm market share (MS) is employed to capture firm efficiency.

3.5 Bank specific control variables

Firm specific variables are included in the regressions analysis and one of the variables is total asset (TA) to capture potential economics or dis-economic of scales in the banking industry that includes bank size, cost and ownership. The postulation clear expected a positive relationship with the profitability dependent variables. Hence significant economies of scale could increase profitability (see Bourke, 1989; Molyneux and Thornton, 1992; Goddard *et al*., 2004) [11, 29]. Other researchers, however, conclude that few cost savings can be achieved by increasing the size of a banking firm, especially as markets develop (Berger *et al*., 1987) [8]. Athanasoglou *et al*., 2008 [3, 4, 5], suggest that the effect of a growing bank's size on profitability may be positive up to a certain limit.

On the other hand economic of scale some time is a disadvantage to the firm because of bureaucratic and other reasons and become lead to negative relationship with profitability (Bikker and Hu, 2002). In addition, the negative relationship may be derived from the fact that larger banks can better diversify their risks; the increased diversification implies less risk and less profits. Hence, the size-profitability relationship may be expected to be negative or positive. In our model, we use banks' total assets to capture the possible relationship between bank size and profitability. Since performance measure is not risk adjusted, we employ four variables to account for banks' various risks, such as solvency risk, business risk, liquidity risk and credit risk. Equity capital is one of the most important factors contributing towards the profitability of commercial banks.

In our empirical regression, the ratio of equity to asset (E/TA) is included which measures the capitalization and proxy solvency risk. Even though the equity capital has been demonstrated to be important in explaining the performance of

financial institutions, its impact on bank profitability is ambiguous. This depends on whether equity is held for prudential reason or regulatory reason. If equity is held to absorb losses (prudent behavior), equity is chosen optimally to address the issue of risk because equity is the full loss absorbing component of the balance sheet. Therefore if a bank chooses to increase equity it will do so to minimize risk and then should enable it to be more profitable. Hence we would expect a positive relationship. However, if equity is imposed at a higher level by regulatory policy and if this raises the cost of capital to banks then we expect a negative relationship with profitability.

The ratio of loans to total assets (TL/TA) and loans to deposits (TL/TD) are also considered as important determinants of bank profitability, as interest earned from loan is the major source of revenue for bank. The loan market is risky and has a greater expected return than other bank assets, such as government securities. Thus, we would expect a positive relationship between TL/TA ratio and profitability, the higher the loans ratios, the higher the rate of return the banks is expected to earn. However we would expect a negative relationship between TL/TD and profitability, because the higher ratio of loans to deposits, the greater costs associated with raising fund and risks associated with loan defaults.

Changes in asset quality may reflect changes in the health of a bank's loan portfolio, which may affect the performance of the financial institution. Duncan, D.and Langrin, B. (2005) conclude that variations in bank profitability are largely attributable to variations in asset quality, since increased exposure to credit risk is normally associated with decreased firm profitability. We use the percentage of loan loss provisions to total loans (LLP/TL) as measure of asset quality. A higher ratio may be associated with more risk and as a results a lower profit.

The operating expenses to total revenue ratio (OE/TR) is included to account for cost differences among banks. The literature argues that reduced operating expenses improve the efficiency and hence raise the profitability of a financial institution, implying a negative relationship between an operating expenses ratio and profitability (Bourke, 1989). However, Molyneux and Thornton (1992) [29] observed a positive relationship, suggesting that high profits earned by firms may be appropriated in the form of higher payroll expenditures paid to more productive human capital (i.e. experienced managers and expertise).In addition, to account for the different types of bank ownership in our sample, dummy variables are included in the model to test whether the ownership status of a bank is related to its profitability.

The relationship between ownership and profitability is examined through the inclusion of one binary dummy variable, namely OWN1 for state-owned banks and In other words, the reference group is private commercial banks. OWN1 equals to one if the bank is state owned, otherwise zero. The coefficient on OWN1 should be negative when the reference public bank coefficient is less profitable than private bank.

3.6 Data and Samples

The information about all variables is gathered from published financial statements of local commercial banks and the NBE database. The data collection is done for all banks in the industry spread over 16 cross-sections (banks) and time period for 2010-2016. This has resulted in an unbalanced pane data set of 112 total observations.

4. Empirical results

4.1 Hausman Test

Both the F-test and the LM test with large chi-square result reject the null hypothesis; hence, the fixed and random effect models appear better than pooled OLS. The Hausman test taking the coefficients of the fixed and random models supported the alternative hypotheses that H1: difference in coefficients not systematic. The chi-square result is with probability less than 0.05 supporting our initial hypothesis that the individual-level effects are adequately modeled by a fixed-effects model. Therefore, the estimation result has been done through the fixed effect model.

4.2 Regression Result

The regression results for the sample of Ethiopia commercial banks between 2010 and 2016 are shown in Table 2 below. The table contains the estimated parameters and t-statistics obtained from regression using ROA and ROE respectively, as the independent variable. The estimated equations seem to fit the panel data reasonably well, as indicated by the R-squared values 0.394 and 0.872 for ROA and ROE respectively (previous studies normally report R square between 0.5 and 0.2). Other SCP studies (see Gilbert (1984), Goddard *et al* (2001) [19] reported even lower values around 0.1. The regression with ROE as profitability measure is statistically preferred over the model with ROE, due to considerable higher R-squared value. Athanasoglou *et al* (2008) [3, 4, 5] also found that the estimations based on ROA produce inferior results for Greece.

Table 1: The SCP estimation results (Panel fixed effect estimation)

Variables	ROA			ROE		
	coef.	t-Vaue		Coef.	t-Value	
(Intercept)	0.031	1.9105		0.339	3.1386	**
MS	0.0063	1.5897		0.1745	1.3477	*
CON	0.0088	1.5911		0.0000	-0.1655	
TA	0.0000	2.9362	**	0.0000	3.7302	***
E.TA	0.0077	1.1752		-1.3725	-4.8948	***
TL.TA	-0.0102	-0.9648		-0.6332	-2.1146	***
TL.TD	0.0110	1.8790	.	0.6548	2.6806	***
LLP.TL	0.0666	7.3780	***	0.581	-1.7112	***
OE.TR	-0.0239	-24.6719	***	-0.108	-3.116	***
OWN1	-0.011	-1.8647		-0.106	-2.7844	*
R-Squared	0.394			0.872		
F-statistic	4.334			45.516***		

Signif. Codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

The table shows that during our sample period, the coefficient on HHI is insignificant when either ROA or ROE is used as profitability measures, while the coefficient on the MS is moderately significant with 5% level for ROE as dependent variables and the sign of the parameter on MS of ROE is positive which is consistent with the SCP hypothesis. So the results from our sample do reject the SCP hypothesis for both ROA and ROE. In the other hand there is a sign that efficiency hypothesis accepted with 5% significance level as ROE taken

as dependent variables. Athanasoglou *et al* (2008) [3, 4, 5] conducted similar analysis in Greek banking industry and found same result for this positive relationship, the effect of both ROA and ROE is relatively insignificant although MS is relatively significant for ROE. This outcome is also in accordance with other recent studies (Berger, 1995) [9] which claim that market share is usually positively related to profitability once other effects are controlled for in the profitability equation.

In theory, as suggested by industrial economists, firms are supposed to be more profitable in highly concentrated market than those in less concentrated one. But our results imply that banks profitability negligibly affected by concentration of the banking sector in Ethiopia. We may explore three possible reasons to explain the relationship.

First, the reason behind this negative relationship is that government owned banks which are CBE accumulated the most assets not directly used to support the bank to earn return, total asset, loans and deposits, thus control the substantial part of the market. But the state-owned banks are seems and policy-directed loans of state-owned enterprises during the 2010s. The state-owned banks, the ultimate aim was not to maximize profit government use it to execute it policy. As a result, lower profitability exists in such high level of concentrated market. Second, the quiet life hypothesis may provide alternative explanation for the negative relationship between market concentration and bank profitability. This hypothesis suggests that banks located in highly concentrated markets may choose to trade off some of their monopolistic profits for a reduction in risk by choosing safer profits. In other words, banks in highly concentrated market may prefer to reduce the variance of their profits rather than increasing the profit itself. The least likely may be the regulation that offers another alternative explanation, which protect the public interest and prevent monopoly profits from collusive behavior. Turning to other explanatory variables, the regression results for control variables are considered below. The effect of bank-specific variables is generally in line with our expectations.

The estimated equation when ROE is the dependent variable shows that bank size is statistically significant but the effect on profitability is seems negligible the parameter of TA is closer to zero for both dependent variables ROA and ROE. This relationship implies that large banks present no economies of scale in Ethiopian banking sector. Weather the amount of assets is larger or smaller bank get no advantage for having branches and more experienced employees. As per expectation the bank would have been to attract more customers and provide more services, so they can make more profits. Moreover, there may be "too big to fail" effect. If the size of the bank is too large, generally there is some implicit assumption that the government will not allow bankruptcy for large banks. Therefore, bank clients expected to be more confident for larger banks than small banks, and large banks should generate more profits, because the failure of large banks has serious impact on the national economy. Moreover, the collapse of one large bank may cause public panic and bank run for other banks due to possible domino effects.

The negative and highly significant coefficient on the ratio of equity to total assets variable is our expectation. The commercial banks loan loss ratio variable is almost insignificant. This suggests that Ethiopian banks hold to much equity, increasing the equity capital will have negative impact on ROE. If the bank holds equity with too little credit risk, the cost of capital will increase and drive the banks to add more equity capital cost. It also implies that too much capitalization; capital costs transmit the expectation of bad performance. The equity capital should be held for prudential reasons, because with a sound capital position; unlike what we obtained in table 3.10, bank is able to pursue business opportunities more effectively and has more time and flexibly deal with problems arising from unexpected losses and reduce also equity related costs while raise profitability.

The parameters on the variable (TL/TA) are negative but significant in ROE and insignificant for ROA regressions. The significant negative effect of loans on bank profitability may be explained by high proportion of non-performing loans.

The parameter of TL/TD is significant with the level of 1% and consistent with our expectation in the case of ROE but not for ROA. The higher the percentage of total loan to deposit negatively affects commercial bank return of income. This happen because of the two main reasons, first bank return decreases, if associated cost of deposit mobilization rises. Secondly excessive lending lead to a possible increase of loan default even this is shown on the same illustrations, the control variables provision of loan loss to total loan ratio indicate, there is a relative problem of bad debts risk. Thus the profitability and the proportion of loans to deposits are negatively related in Ethiopian banking market.

The variable (LLP/TL) is significantly related to bank profitability, showing that the commercial banks in Ethiopia should focus more on the credibility assessment, loan monitor, and risk management, which has proved not strong in the recent past. Loans problems have arisen mean while bank hold more than prudential equity to absorb loan impairment and equity related cost arises. Thus, On the other hand the commercial bank might be too much conservative to take risk to maximize profit. The management transparency of the financial systems is quite essential, which will assist banks to evaluate credit risk more effectively besides taking commendable risk to maximize ROE or ROA.

The operating expenses appear to be an important determinant of profitability. This variable presents a negative and significant effect on banks profitability. This implies a lack of competence in expenses management for Ethiopian banks, since banks pass part of increased cost to customers and the remaining part to profits, possibly due to the fact that competition does not allow them to "overcharge". Clearly, efficient cost management is a prerequisite for the improved profitability of the Ethiopian banking system.

Regarding the ownership variable, the parameter of state owned bank is both negative and statistically significant at a level of 5%, which is consistent with considered expectation for ROE. Our findings show that state owned commercial banks perform relatively weaker than private commercial banks. Whereas ownership type impact did not featured in ROA cases, this finding is not surprising in light of previous research regarding transition economies (see Bonin *et al*., 2005).

In sum, as the parameter on HHI is insignificant, and the

coefficient on efficiency proxy MS is relatively insignificant in the case of ROA, our empirical results clearly reject the SCP hypothesis in both cases but efficiency hypothesis was accepted in the cases of ROE in the context of Ethiopian banking market during 2010-2016. With regard to control variables all the variables are found that they are significant factors for explaining bank performance for ROE, whereas variables except TA, OE/TR and LLP/TL are significant for ROA in the Ethiopian banking market.

5. Conclusion

A substantial body of empirical research has failed to resolve the 'collusion versus efficiency' debate conclusively. According to the 'collusion hypothesis', high concentration reduced the costs of collusion, resulting in higher rates being charged on loans, lower interest paid on deposits, higher fees, and so on. The alternative efficiency hypotheses explained the relatively high profitability of banks operating in concentrated markets by a tendency for larger banks to operate more efficiently than their smaller counterparts. Therefore it is debatable whether the high profits earned by large banks are a consequence of their operating in concentrated markets and adopting collusive price-setting practices, or of superior production and management techniques (higher efficiency) that reduce costs, resulting in high profitability.

Although there are a large number of studies investigate market structure, conduct and performance in the banking sector for a number of countries, there is hardly such a study that sheds light on Ethiopia. Thus our study aims to evaluate domestic commercial banks in Ethiopia under the structure-conduct-performance framework. And provide new evidence to this literature.

The research is an empirical study that explores the impact of industry structure and efficiency situations on performances incorporating various factors. It has used a quantitative approach to examine the relationships among proxies of industry concentration, efficiency, and control factors with bank profit and price performances. It has used 16 commercial banks operating in Ethiopia between the periods 2010-2016. It has used panel data sets that have both time series and cross sections elements that established 112 total observations. The empirical result has rejected the Structure-Conduct Performance (SCP) hypothesis which theorizes a positive and significant relationship between industry concentration and performances measures. We expected though market power affect price which eventually result positively to performance growth as per the theory of SCP, but the finding shows otherwise on the effect of concentration and efficiency on bank performances.

To put it in the nut shell the test result on the two debating hypotheses in Ethiopian banking market over the period from 2010 to 2016 reject both the traditional SCP hypothesis and the efficiency hypothesis as explanation for the bank performance in Ethiopian banking industry, though it is not enough reason to justify, using ROE as dependent variables there is 10% significant level marginal relationship between efficiency and profitability of commercial banks. It appears that each of these models is insufficient to understand the Ethiopian bank market behavior, because they fail to give clear econometric results. It's necessary therefore to test range of models that can be used to understand the banking market in Ethiopia.

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