International Journal of Financial Management
8 (2) 2018, 11-25
http://publishingindia.com/ijfm/

Empirical Evidences on Structure-Conduct-Performance Relationship in Banking Sector: A Literature Review

Tesfaye Boru Lelissa*, Abdurezak Mohammed Kuhil**

Abstract

A detailed review of existing literature on the structure-conduct-performance (SCP) relationship indicates that the empirical divergence between SCP and competing hypothesis is still not conclusive which is attracting many research works across the world, and recently in Africa. Studies on SCP are dominated by quantitative analysis with exclusion of non-quantifiable variables such as related to conduct and/or those lack data (regulation). The majority of studies employ a multiple linear regression model where a measure of bank performance (mostly profit) is regressed on market concentration variables (such as k-firm, Herfindahl-Hirschman Index, etc.) along with some control variables. Studies that used the structure model have limited focus on other key variables like regulation, macroeconomic, and industry factors. They have also applied a quantitative approach and assumed conduct as being a derivative of the market structure. Hence, there was no attempt to explore the behavior of banks within the given structure, banking, and macro environment. Few studies have explicitly considered Ethiopia's banking performance using the structural approach (SCP or ESH). Nevertheless, the existing bank performance studies were not analyzed incorporating big banks in the industry, with long period observation of banks, using parametric and non-parametric methods, which are scarce in the Ethiopian context.

Keywords: Structure, Conduct, Performance, Bank, Ethiopia

Introduction

The structure-conduct-performance (SCP) framework, which originated from the works of Mason (1939) and Bain (1951) as a method of analyzing industry concentration, has made its focus in the manufacturing sector (Sathye, 2005). It was later (in 1961) introduced into the banking industry following the work of (Schweiger and Mcgee; Atemnken and Joseph, 1999). It has therefore remained as a commonly used model to test the casual link between industry concentration and bank performance (Berger and Hannan, 1998). Consequently, several studies intended to explore the link between market power, efficiency and performance of banks were conducted in several countries (Claeys and Vennet, 2008, Deltuvaite et. al. 2007, Flamini et. al, 2009, to mention but only a few). In other words, the studies focus mainly relied on testing the validity of the basic proposition of the traditional SCP paradigm that the industry concentration lowers the cost of collusion between firms and results in higher than normal profits. The communalities among the studies tend to encircle around testing the two contrasting market paradigms, the SCP and the efficient market hypothesis. The two competing views are based on the concept of market power, structure conduct, performance and relative market power (RMP) on one hand, and efficiency-based explanations on the other (Chortareas, 2009). The market power hypotheses are based on the premise that banks with a higher market share might earn superior profits due to their market power (Shepherd, 1986). A disintegration of concepts has also been observed in the efficient structure proposition. The relative X-efficiency (ESX) hypothesis states that more X-efficient banks (due to better management or better technology) have lower costs of operation, higher profits and bigger market shares which may result in greater concentration (Demsetz, 1998). Therefore, banks operating at optimal economies of scale will better reduce their unit costs which result in higher unit profits. This

* PhD Candidate, UNISA, Vice President, Debub Global Bank S.C., Ethiopia. Email: teskgbl@gmail.com
** PhD, Assistant Professor of Business Leadership, School of Commerce, College of Business and Economics, Addis Ababa University, Ethiopia. Email: abdurazak.mohammed@aau.edu.et

in turn may be translated to gain in market share and/or greater concentration. Therefore, concentration remains the result of efficiency rather than market power as presumed in market power theories. Nevertheless, the studies result shows a mixed and inconclusive empirical evidence to point out the supremacy of one model over the other (Gilbert, 1984; Goddard et al., 2001). The major objective of this work is to explore the developments in approach and methodologies to explain the link between market structure and performances. More specifically, it investigates the variation in the findings of previous studies, methodologies, and approaches, the variables used, as well as variation across regions. The study also provides the observed gaps in market structure studies and future exploration areas for further research.

Evidences on a Positive Link between Structure and Performance

The theory surrounding the SCP hypothesis is that certain industry structures are suitable to monopolistic conduct allowing firms to augment prices beyond marginal costs thereby making unusual profits (Bain, 1951). The direct effect of this conduct is a reduced competition and imperfect market structure (Shepherd, 1985). SCP pointed out that changes in industry concentration may have a positive pressure on a firm's financial performance (Goldberg & Rai, 1996). Therefore, the resultant positive link between industry concentration and performance emanates from the anti-competitive behavior of firms with large market share (Berger & Hannan, 1998).

Empirical studies also put forward a positive and statistically significant connection between market structure and bank performance. The basic conclusion from the evidences appears that markets that are more concentrated attract less degree of competition. The SCP hypothesis, therefore, reigns in situations where the impact of market concentration was found to be significantly positively related to firms' profitability. There are many empirical studies of SCP relationships in the banking industry that support this hypothesis. For instance, Gilbert's (1984) survey on 44 studies depicted that 32 of the studies were in line with the fact that market concentration is significantly and positively related to bank performance. Moreover, a positive link between bank concentration and profitability measure (ROE) was found by Short (1979) in a study which was based on a sample of banks from Canada, Western Europe, and Japan. Similarly, Moore (1998) explored the casual link between concentration ratio and profitability using both univariate and multivariate regression tests and found that the bank concentration had positively affected performance. He has added technology variable to the model and found that the positive relationship does not alter even when technology variable varies. In addition, the results by Berger and Hannan (1989), and Pilloff and Rhoades (2002) are in line with the SCP predictions of a significant effect of industry concentration on performances.

Studies Supporting the Efficient Market Hypothesis

The SCP supporters' empirical test is challenged by a thought from the efficient market theorists and mainly of Demsetz (1973) and Peltzman (1977). They argue that banks are able to maximize profits and gain market share by being efficient. Consequently, market concentration increases following a rise in market share, which is a gain from the superior efficiency of the leading banks (Simrlock, 1985). Smirlock (1985) and Evanoff and Fortier (1988) attempted to demonstrate that a relationship exists between bank market share and bank profitability but not between concentration and profitability.

As discussed in previous sections, Berger and Hannan (1998) has laid down a methodology to assess impact of such relationship (efficiency-profitability) including direct measures of inefficiencies (X- and scale inefficiencies). The addition of two efficiency measures therefore has resulted in four competing hypotheses. Two market power theories (SCP and RMP) which are based on industry concentration and market share measures and two efficiency theories (ESX and ESS) that are based on managerial and scale efficiency elements. The study of Berger and Hannan (1998) finds that a positive and statistically significant relationship exists between the market share and X-efficiency variables with bank profits. More recent studies (Prasad & Radhe, 2011; Seelanatha, 2010) have followed the Berger and Hannan methodology by explicitly including the efficiency measures in their estimations.

Methodology and Approaches

The SCP approach uses a model that can examine whether a highly concentrated market causes collusive behavior among large banks and whether it improves market performance. Usually, literature applied a multiple linear regression model to test the SCP hypotheses (Berger et al., 2003). Studies use the formulation shown in Equation (1) to postulate statistically the performance of the profit concentration relationship.

$$Pi = f(CR, Xi), \quad (1)$$

where Pi is some measure of performance of the i-th bank, CR is the banking industry's index of concentration, and Xi denotes a set of control variables that are firm specific or industry specific characteristic.

Whereas a positive correlation between banks' performance and market concentration was frequently found, the interpretation of this result, and hence the policy implication, varied among the studies. Bain (1956) interpreted it as support for the SCP hypothesis, which asserts that banks in a concentrated market are more likely to engage in some form of non-competitive behavior such as collusion, consequently setting less favorable prices to customers and earning higher profits. Others (Demetsz, 1973) viewed it as support for the ES hypothesis, increase in market share and size of big firms are results of efficiency than concentration. Therefore, such an ambiguity in interpreting the result of same regression result might be a reflection of the significant limitation of the approach.

To solve such ambiguities, Simrlock (1985) revisited the previous model in his study of concentration and profitability. The approach used is to incorporate both market share and concentration measures to test the relationship between concentration and profitability. Most importantly, the model provides strong emphasis on testing the relationship between market share and bank performance. The empirical model is constructed as follows:

$$Pi = f(b1MS , b2CR , MSCR + Z) \quad (2)$$

where Pi represents the performance, MS is the market share of the bank, CR is the concentration ratio, MSCR is MS multiplied by CR (representing an interaction term), and Z is a vector of additional control variables.

The previous model is very useful in evaluating the two competing hypotheses. If $b1 > 0$ and $b2 = 0$, the efficient structure hypothesis is supported. If $b1 = 0$ and $b2 > 0$, the profits are not affected by market share but are influenced by market concentration, supporting the SCP hypothesis. If both *b1* and *b2* are greater than zero, the results could be subject to different interpretations. The supporters of the SCP hypothesis would view the results as showing *that "all firms in concentrated markets earn monopoly rents from collusion*" (Smirlock, 1985, p. 74). The monopoly rent from concentration will go to the largest firms instead to the most efficient firms. The supporters of the ES hypothesis would see the results as evidence "*that leading firms are more efficient than their rivals*" (Smirlock, 1985, p. 74). In order to interpret the findings correctly, therefore additional variable is introduced (MSCR) as an additional regressor. If the coefficient for MSCR is positive, collusion is present. However, if it is less than zero, collusion is not present. Still however, the controversies related to the interpretation of similar regression results are far to get a final solution (Berger et al., 2003). For instance, a positive coefficient estimate for market share along with an insignificant value for concentration is interpreted as a support for market power hypothesis (Kurtz & Rhoades, 1991; Rhoades, 1985; Shepherd, 1986). Same result however is looked to support the efficiency hypothesis (Evanoff & Fortier, 1988; Smirlock, 1985). Other authors construe a positive link between market share and profitability, which favors the efficiency hypothesis in industrial organization (such as Gale & Branch 1982; Stevens, 1990).

Berger and Hannan (1998) tackled the problem by explicitly incorporating two efficiency indicators, which measure the X-efficiency and scale efficiency of banks as explanatory variables in the regression equations. In addition, two market structure indicators, which are proxied by banks' market concentration and market share, are included in their model. Four testable hypotheses are specified (instead of the usual two), SCP, RMP, ESX, and ESS. The traditional SCP hypothesis remains unchanged, i.e. higher profits are the result of anti-competitive price settings in concentrated markets (Bain, 1951). A related hypothesis is the relative market power hypothesis (RMP), which claims that firms with large market

shares are able to exercise market power to earn higher profits. The difference between SCP and RMP is that the latter need not occur in concentrated markets. The remaining two hypotheses relate to the efficient-structure hypothesis, which posits that the larger market share is the result of efficient operations of the firms. Efficiency, however, is broken into two components. Under the X-efficiency hypothesis (ESX), the firms with superior management or production processes operate at lower costs and subsequently reap higher profits. The resulting higher market shares may also lead to higher market concentration. The scale-efficiency hypothesis (ESS) states that firms have similar production and management technology but operate at different levels of economies of scale. Firms operating at optimal economies of scale will have the lowest costs and the resulting higher profits will lead to higher market concentrations.

Both versions of the efficient-structure hypothesis provide an alternative explanation for the positive relationship between profit and market structure. To determine which of the four hypotheses is valid, Berger and Hannan (1998) used the following model:

$$Pi = f(X\text{-}EFFi, S\text{-}EFFi, CONCm, MSi, Zi) + ei \quad (3)$$

Where,

- P is a measure of performance
- X-EFFi is a measure of X-efficiency, reflecting the ability of banks to produce a given bundle of output at minimum cost through superior management or technology
- S-EFFI is a measure of scale-efficiency, reflecting the ability of banks to produce at optimal output levels (economies of scale), given similar production and management technology
- CONC. is a measure of concentration in market m
- MSi is market share of bank i in market m
- Zi is a set of control variables for each bank i
- ei is an error variable for each bank i

After resolving such interpretation difference through methodological innovation, the succeeding research has evolved in several directions. Studies using the SCP approach are now are incorporating several variables from the environment such as bank risks, regulation, the quality of banking services, and the ownership and size of banks (Berger et al., 2003). Other studies have applied non-structural approach based on factors firm specific factors to find out the situation in the market structure. For instance, Panzar and Rosse (1987) applied H-statistics to observe the competition situation of the banking industry (Casu & Girardone, 2006). Others use the Lerner Index of monopoly power (Guerrero et al., 2005) and recently the Boone Indicator is also used in the competition analysis.

The majority of studies, however, still rely on tests of market power and/or efficiency as analytical models of bank competition (the reviews of Gilbert and Zaretzky, 2003; Hahn, 2005; Northcott, 2004; Punt & Rooij, 2001; Yu & Neus 2005, Vennet, 2002; etc.). Studies that are more recent are also being conducted in Africa (Nabieu, 2013; Simbanegavi et al., 2012) and others. Nevertheless, the theme of the studies has to explore the role of different factors in explaining the competitive conditions in banking markets. The difference appears to be between the structuralist that claim to begin from the industry concentration to study the conduct of firms as well as others who opt to start from the conduct of firms to study the industry structure.

Critics on the Approach or Methodologies

The SCP model has been challenged on both grounds, theoretical, and empirical. The criticism on SCP originated against background of mixed empirical evidences questioning the robustness of the model (Molyneux et. al. 1996). The lack of consistent results has led some researchers to argue that the literature contains too many inconsistencies and contradictions to establish a satisfactory SCP relationship in banking (Mooslechner & Schnitzer, 1994). More specifically, in banking study, the model is challenged by the difficulty to define a meaningful market area and sets a reasonable measure of industry concentration. In addition, setting performance standard is problematic as banks are multi-product firms. Overall, the paradigm has several criticisms, which can be classified into three categories, i.e. those related to measurement, econometric, and interpretation problems.

Concerning the interpretation problems, a theoretical challenge was initially set by the efficiency theorists, Demsetz (1973) and later by Berger (1995). They

hypothesize that unlike the claim of the SCP, the large market share, which causes a high level of industry concentration, emanates from superior efficiency performances rather than a lower level of competition. As discussed in the previous section, the controversy over the interpretation is commonly cited as the "market power" versus "efficiency" debate. Besides such debate, Molyneux (1999) argues that due to increase in type and number of financial service providers, concentration in the banking markets is becoming less and less relevant in terms of competition policy. Others, however, (e.g. Dermine, 2002) emphasized that in certain areas of banking, the dominance of banks has not yet been broken and hence concentration remains a big challenge need to be addressed.

With regard to measurement problems, originally the debate focused on the relative merits of alternative accounting measures of profitability. More fundamentally, it has been questioned whether accounting measures can be used at all as proxies for market power (price over marginal cost) (Mullineux & Sinclair, 2000). If this is not the case, market power has to be estimated since marginal cost is not observable. Other arguments are against the use of concentration as a measure of the level of market structure. For instance, Mullineux and Sinclair (2000) argue that even though concentration may result in higher prices, lowering the demand for services does not necessarily cause higher profits performance for a highly concentrated banking sector. The SCP paradigm assumes that each bank profits from high prices caused by collusion among market participants. Thus, profitability depends to some extent on concentration (Bain, 1956). The concentration ratios, the most frequently employed in empirical analyses Bikker (2002a) are:

- The CRk index, which sums the market shares held by the k largest banks, places equal emphasis on leading banks and ignoring the rest;
- The Herfindhal index, which places greater emphasis on larger market players and allows for each bank, adopts a calculation method that automatically excludes the competitive conduct of banks as a diminishing factor.

Regarding econometric problems, a limitation of this paradigm is that it assumes the causation to be unidirectional (Goldberg & Rai, 1996). For example, market performance can have feedback effects into market structure. In addition, the linkage between structure and conduct remained uncertain and the direction of causality is also problematic. In addition, there appears a dispute over the structure-performance relationship due to the possibility of a non-linear relationship. Jackson (1997) has found a negative relationship between concentration and deposit rates in markets with low concentration. The negative correlation ceases to exist in middle levels of concentration and becomes positive in highly concentrated markets. This suggests the existence of a U-shaped relationship between market concentration and prices. Berger and Hannan (1992) as well as Goldberg and Rai (1996) have cited the non-linear nature of the profit (price)-concentration relationship (for U.S. markets).

Other critics that include the empirical studies employing the SCP model fail to allow for banks' market conduct explicitly (Bikker & Haaf, 2002a). Instead, in effect, they treat it as being determined by the structure. In addition, empirical studies often fail to consider factors that may be important in terms of assessing an actual relationship between structure and performance. For instance, Gilbert (1984) argues that a serious shortcoming of earlier SCP studies in the United States is that they ignore the impact of regulations on concentration and performance.

Variables Used

Performance

The literature on bank performance has closely tied bank performance with both price and profitability measures. The price measures includes net interest margin, spread and profit measures consists of return on assets, return on equity and net interest margin. However, both measures rely on the accounting measures. This is because the data sources of the studies are mainly of publicly available bank-specific data, which are reported following certain accounting procedures and rules. Adjustment to economic variables might be difficult due to unavailability of data.

Regarding the price-profit performance measure debate, some scholars argue that bank profit is an appropriate measure of bank performance and criticize price measures as poor measures of bank performance (Civelek & Al-Almi, 1991). He argued that the used profit measure helps to capture the banks major objective, profit maximization, by including both cost and revenue elements.

On the other front, some studies prefer to measure performance in terms of bank prices rather than bank profitability (Smirlock, 1985). This is because of the use of price-concentration relationship enables to observe the noncompetitive behavior of the industry in relation to high levels of concentration. In other words, the price effect implies the market discrimination power of the leading firm, i.e. whether concentration has resulted in lower interest rates given to depositors and/or higher lending rates to borrowers (Chirwa, 2001). However, such argument is criticized for the fact that price measures of performance create problems of cross subsidization of multi-product firm like banks (Molynex & Forbes, 1995). Therefore, the profit measure is the preferred performance indicator in banking studies. The accounting profitability measures, mainly of the ROA, provide indications about how the bank's assets are effectively utilized to generate profits (Chirwa, 2001). However, other measures such as return on equity used by Short (1979) and Bourke (1989) or profits margin are generally utilized.

Efficiency

Efficiency can be measured using parametric and non-parametric techniques. The applications of non-parametric techniques exceed the usage of the parametric ones (Berger and Humphrey, 1997).

The data envelopment analysis (DEA) models are the widely used non-parametric techniques among others. The DEA in banks are estimated using the assumption of both constant return to scale (CRS) and variable returns to scale (VRS). However, there is a controversy as to rely on which of the two approaches. Supporters of VRS argue that CRS is only appropriate when all firms are operating at an optimal scale (Fiorentino et al., 2006). Therefore, it might be unrealistic to expect perfection in bank operation all the time. Nevertheless, other studies argue in favor of CRS because the CRS allows the comparison between small and large banks (Miller & Noulas, 1997).

Studies in banking obtain efficiency score estimates under the input-oriented approach. This is most likely because a bank's output can possibly be determined considering the level of its input. For instance, a bank mobilizing deposits can generate more loans. In addition, it is assumed that banks have higher control over inputs rather than outputs. There are also some studies that adopt the output-oriented approach (Ataullah & Le, 2006). The input-oriented and output-oriented measures always provide the same value under CRS. There might be variation when they are computed under VRS assumption (Coelli et. al., 2005). Therefore, in many instances, the choice of orientation has only a limited influence upon the DUM scores obtained (Coelli et. al, 1999).

With regard to the approach used, Berger and Humphrey (1997) argue that the intermediation approach is the one favored in the literature. The production approach is criticized for the difficulties in collecting the detailed transaction flow information required in the production approach. As a result, the intermediation approach is the one favored in the literature.

The commonly used inputs in DEA computation are deposits, fixed assets and personnel (Casu and Girardone, 2004). However, some studies use branches (Chen, 2001), loan-loss provisions (Drake et al., 2003), and equity (Sturm & Williams, 2004) as additional or alternative inputs. Several studies use two outputs, usually, loans and other earning assets (Casu & Molyneux, 2003). Canhoto and Dermine (2003) use the number of branches as an additional output under the assumption that it represents an additional value for retail customers. Finally, recent studies include non-interest income or off-balance-sheet items as additional outputs (Weil, 2004).

Concentration

The Herfindahl-Hirschman Index (HHI) is one of the commonly used measure of bank concentration in both the theoretical literature and empirical studies. In addition, it often provides as a yardstick to appraise the application of other concentration indices (Bikker, 2002a). Similarly, the k-bank concentration ratio is comparatively used to measure the level of industry concentration (Molyneux et al. 1996). As reported in Molyneux, out of 73 US SCP of the banking sector, 37 studies have used the 3-bank deposit concentration measure; whereas, 18 studies employed the HHI. On the other hand, for highly concentrated market, some studies also used a single-bank concentration ratio (Beighley & McCall, 1975; Kaufoman). There are also instances on the usage of two-bank concentration ratio (Ware, 1972). However, as stated previously, the three-

bank concentration ratio based on the deposit market has been the most widely used (Edwards & Heggestad, 1973). The four-bank ratio is also extensively employed due to its merit of addressing the problem of data confidentiality and its high weight to provide weight on smallness, which is an attribute of some industry structures (Kinsella, 1981).

An exhaustive study mixed use of both HHI and the k-bank concentration ratios, for k = 3, 5, and 10 is also done by Bikker and Haaf (2002a). He has computed the indices based on market shares in terms of total assets of banks considering 20 countries. He has concluded that the differences across countries in the HHI relate most profoundly to the variation in the number of banks. Furthermore, the variation in k-bank concentration ration is mainly a result of the difference in the skewness of the bank-size distribution rather than the number of banks. Overall, apart from a few exceptions, the rankings of countries based on the various indices have witnessed homogeneity for the various indices considered. Therefore, the indices are practically tested for their appropriateness to measure bank concentration. Astonishingly, the result in the rankings of the HHI and the 3-bank concentration ratio bear the closest similarity (with a correlation of 0.98), while the ranking based on the 5- and the 10-bank concentration ratios slight differ more from the HHI (with, respective, correlations of 0.94 and 0.86). This examination provided an empirical insight on the long stayed concern in the literature regarding the selectiveness of the k bank indices (only considers big banks) as compared to the HHI, which incorporates all banks in its market share computation.

Regulations

Literature is not also conclusive on the impact of regulation on bank performance. Some authors consider that effective regulation of bank entry can promote stability and enhance prudent risk behavior (Keeley, 1990). Others consider regulation as a barrier to hinder competition therefore allowing for inefficiencies (Shleifer & Vishny, 1998). Therefore, countries with greater regulatory restrictions on bank activities are associated with lower banking sector efficiency (Barth et al., 2001). Worsening the scenario, regulations like restrictions on bank entry are associated with greater bank fragility (Allne & Gale, 2004) and lower bank margins (Demirgüc-Kunt et al., 2003).

The usually used variable to mediate the effect of regulation on bank performance is the capital level. However, there appears variation on the empirical result. Those supporting its positive impact justify its service as a buffer against losses and hence failure (Dewatripont & Tirole, 1994a). On the other front, negative news related to capital may cause banks to reduce lending (Brealey, 2001) and may encourage banks to take more credit risk.

Studies also consider bank ownership type as a variable to represent regulatory freedom. Claessens and Laeven (2003) find that banking systems with greater foreign bank entry, fewer entry and activity restrictions are more competitive. LaPorta et al., (2002) examine the extent of government ownership to represent the degree of regulatory involvement. Claessens. et al., (2001) show in a cross-country study that foreign bank entry makes domestic banking systems more efficient by reducing margins.

On the other front, studies consider the degree of liberalization of the banking system. The impact of financial deregulation is typically assessed either through a dummy variable (Salas & Saurina, 2003), or simply examining the behavior of banks during periods of financial deregulation (Das & Ghosh, 2006). The findings indicate that the impact of deregulation on bank behavior depends, among others, on the state of the banking system and differs significantly across bank ownership.

Control Variables

Studies have used either or all of bank-specific, industry-specific, and macroeconomic-related factors to explain bank performance (Nissanke & Aryeetey, 2006). Panayiotis (2005) showed that bank profitability is a function of internal and external factors. Internal factors include bank-specific, while external factors include both industry-specific and macroeconomic factors. According to this literature, six standard key bank-specific indicators are widely used to study banks. These include profitability, capital adequacy, asset quality, operational efficiency, and growth in bank assets and earnings. However, the most widely used variables and framework is the CAMEL rating framework (Barr, 2002). Barr (2002) showed that CAMEL-rating criteria has become a concise tool for examiners as well as regulators and found that there is a significant relationship between CAMEL ratings and efficiency scores.

Another strand of literature emphasizes the importance of industry and macroeconomic variables in explaining performance heterogeneities across banks. This literature is based on the SCP paradigm and applicable to contestable markets, firm-level efficiency, and the roles of ownership and governance in explaining bank performance (Berger, 1995; Berger and Humphrey, 1997; Bikker and Hu, 2002; Goddard et al., 2004). In terms of variables used, industry-specific factors include ownership, bank concentration index, and financial deepening. In addition, bank size and economies of scale are used as industry specific variables. Bank size is measured as the bank's total deposits (assets) or as an average measure based on total assets takes into account differences brought about by size such as economies of scale (Molyneux & Forbes, 1995). Conversely, Evanoff and Fortier (1988) established that any positive influence on profits from economies of scale might be partially offset by greater ability to diversify assets resulting in a lower risk and a lower required return. Therefore, the empirical results on the performance of bank size variables are mixed.

The macroeconomic factors include interest rate, interest rate spread, inflation, and levels of economic growth represented through either GDP or GDP per-capita (Panayiotis, 2005).

Studies by Region

From the side of developed economies, SCP theories have been tested widely alongside its counterpart, the efficiency theory for the United States and European banking sectors. Recently, similar studies are also being conducted in the developing nations' banking environment. The studies have two variants in terms of region classification: some studies focus on single countries while others are done considering cross-countries. The literature focusing on single country includes, for instance, Colombia (Barajas et al., 1999), Malaysia (Guru et al., 1999), Italy (Girardone et al., 2004), UK (Kosmidou et al., 2005), Korea (Park & Weber, 2006), etc.

Some other studies consider a large number of countries and most of them use extensive number of countries under limited period of observations. For example, Beck et al. (2003) explored the link between industry concentration and performance for 364 banks operating in eight Central and Eastern European Countries for the period 1998 to 2001. The result rejected the SCP theory, but accepted one of the market power variant, the Relative Market Power hypothesis. In the same manner, Gonzalez (2005) investigates the efficiency- structure of the banking sectors considering 69 countries during 1996–2002, hence, having around 2,592 observations. The study's findings support the efficient-structure hypothesis and acknowledge bank regulation, supervision. Financial structure and financial development are statistically significant relationships with bank profitability. Claessens et al.'s (2001) study considers 80 countries from 1988 to 1995 and explores the variation in profits, net interest margins, overhead, and taxes between different bank ownership types (domestic and foreign banks).

A separate evaluation on specific countries shows that results are mixed. For instance, studies done on the US banking sector has resulted in contrasting outcome among the SCP and the ES hypotheses. For example, as discussed earlier, Smirlock (1985) rejects the SCP by exploring a statistically positive relationship between market share and profitability and a statically insignificant relationship between concentration and profitability. The result supports the argument that banks in the United States are more profitable because of their high-efficiency performances. Rhoades (1985), on the other hand, finds a strong relationship between profitability and concentration as well as also between market share and profitability in the United States. He suggests that a positive relationship between market share and profitability does not reflect product differentiation advantages such as allowing banks to charge higher prices. He thus accepts both the SCP and RMP hypotheses although allocates more importance to the latter one due to a higher coefficient. Evanoff and Fortier (1988) compare the collusion and efficiency hypotheses in the United States. They find a strong relationship between market share and profitability. They conclude that the concentration index is insignificant, thus, rejecting the SCP. However, having found a positive relationship between market share and profitability they accept the RMP hypotheses. They explain this result by stating that there is some evidence supporting the efficiency hypothesis since controlling for market growth. They found a negative result between market share and profitability. Berger and Hannan (1989) analyzed the relationship between concentration and price through

a direct measure of profitability for the deposit market in the United States. Moreover, they use three types of concentration ratios to model for the concentration index. They find a negative relationship between concentration and price, which is indicative of accepting the SCP explained by banks paying lower deposit rates to consumers. In a recent study on US banking, Tregenna (2006) analyzed the effects of structure on profitability for the period of 1994–2005. Bank-level-panel data are used to test the effects of concentration, market power, bank size and operational efficiency on profitability. The author observed that efficiency is a strong determinant of profitability; whereas, there was robust evidence for positive concentration-profitability relation.

There are a number of studies focusing on Europe analyzing the SCP hypotheses. Bourke (1989) analyzes a set of European countries and although he finds a positive relationship between the concentration index and profitability, the explanatory variable of the concentration index is too small. Molyneux and Forbes (1995) test the SCP and RMP hypotheses for a group of European countries and find insignificant values for the concentration index thus rejecting the RMP and accepting the SCP hypothesis. Molyneux and Thornton (1992) also study a group of European countries and find evidence supporting the SCP. Nevertheless, they did not test the RMP hypothesis. Results in Molyneux (1993) study in selected countries like Portugal, Spain, Sweden, United Kingdom, and Turkey appear in line with the SCP model. Vennet (1993) also accepted the SCP hypothesis in Portugal, Spain, Ireland and Belgium.

Goldberg and Rai's (1996) study accepts the relative market power rather than the SCP hypothesis for some European countries. Moreover, their study also supports the efficient-market hypothesis establishing a positive relationship with performance. A study in Spain by Maudos (1998) test finds a similar result supporting both the efficiency and relative market power hypothesis. A test on the aforementioned models by Punt and Van Rooij (2001) for a group of European countries overwhelming supports the X-efficiency version of the efficiency theory and claims for nonexistence of collusion behavior among banks in Europe. Unlike the previous study's findings, Vennet (2002) research findings on a group of European countries partially support the SCP and convincingly the X-efficiency model. In addition, Hahn (2005) tests the structure and efficiency theories for Austrian banks and finds empirical evidence that supports the SCP. Some studies also find a result supporting both the efficiency and SCP theories. For instance, Yu and Neus (2005) find evidence supporting both efficient and SCP hypotheses for the German banking sector. Therefore, the study results in previous research seems to vary in their conclusions. Studies done at European banking, for instance, show that the level of market power in the European banking industry is considerable (Bandt and Davis, 2000; Molyneux et al., 1994; Molyneux & Forbes, 1995). On the other hand, others witness the reduction in collusive behavior in Europe. For example, Neven and Roller (1999) considering seven European countries (France, Denmark, Germany, Spain, the United Kingdom, Belgium, and Netherlands) concluded that there is a significant increases of competition over time in the mortgage market and the conduct of banks is growing being less collusive over time. Some authors associate the change in such bank conduct to the various deregulation and reform measures in the banking sector. For instance, Cerasi et al., (2001) argues that the increase in the degree of competition within the European retail-banking sector associates with deregulation. Similarly, Bandt and Davis (2000) find that the Italian banking system, which is being deregulated, is operating at an increased competition level. Nevertheless, some authors like Gual (1999) claim that market integration and enlargement appear one of the significant causes to witness a diminished concentration level in the European banking market.

As observed in the developed nations, the empirical evidences from the studies done in developing and emerging banking markets witnessed a mixed result regarding the structure-efficiency debate. For instance, a study of Claessens et al., (2001), which consists of 80 developing countries from 1988 to 1995, did not reject the collusion theory. The result shows foreign investment relates positively with profitability and high interest rates, whilst they have increased overhead costs contradicting the hypothesis that foreign bank profitability is driven by higher efficiency. Berstain and Fuentes's (2005) study on the link between banking concentration and price rigidity in Chile for the period of 1995 to 2002 finds that high concentration generates more rigidity in the deposit rates. Their findings are interpreted as being broadly aligned with the SCP theory. Unlike such findings, a cross-country

analysis on developing nations market by Gonzalez (2005) results in an outcome supporting-efficiency hypothesis. A study in emerging market by Park and Weber (2006) from a sample of Korean banks evidenced that bank efficiency rather than collusion is a cause of improved bank in Korea. Samad (2008) tests the validity of these two hypotheses (SCP and ESH) for the Bangladesh banking industry by using pooled and annual data for the period 1999-2002; he finds support for ESH as an explanation for market performance in Bangladesh. The most recent studies on emerging banking markets that have found support for the efficient structure hypothesis are Seelanatha's (2010) on Sri Lanka and Chortareas' et al. (2011) on Latin America. Other studies in developing nations are also in line with some of the variants of the structure-efficiency hypothesis. For instance, Guerrero et al.'s (2005) study on the Mexican banking industry finds evidence in support of the relative market power hypothesis.

In Africa, Fosu (2013) has concluded that despite record levels of new entry and foreign penetration, very high levels of concentration characterized African banking sectors. The average HHI is as high as 2,059, whilst the five-bank concentration ratio stands at 77.29% for the entire African region. On the positive side, concentration assumed a downward trend across all the sub-regions over the past few years. The HHI shows dramatic and consistent downward trend in all sub-regional banking sectors except West Africa, where the trend is moderate. The decline is associated with African governments' willingness to embark on financial sector restructuring involving deregulation and a relaxation of entry barriers to foreign investment (Beck & Cull, 2014). The financial sector reforms include reducing credit controls and reserve requirements, removing interest rate controls, reducing entry barriers to foreign banks; state ownership, developing securities markets, strengthening prudential regulation, and supervision. These developments appear to have improved the financial soundness of African banks (Amidu, 2013). However, the high concentration level is a describing attribute of African banks. Fosu (2013) witnessed the previously mentioned scenario using the five-bank concentration ratios. Therefore, consistent with other emerging economies, the study result suggested that African banks generally demonstrate monopolistic competitive behavior.

Country-specific studies in Africa also witnessed the prevalence of a high level of banking market concentration. For instance, studies in the South African banking sector show that the banking industry exhibited a high concentration feature (Falkena et al., 2004; Okeahalam, 2001). Therefore, the African banking market remains with a structural problem to ensure a competitive market as the high share of the banking market is still controlled by few large banks. Studies also show that structural rigidities, evidenced by high interest rate spread, remain major impediment to achieving competitiveness in the banking sector in Africa (Beck & Fuchs, 2004). Sanya and Gaertner (2012), Mwega (2011), and Mugume (2010) in separate studies, empirically assess bank competition in four countries, Kenya, Uganda, Tanzania, and Rwanda. Sanya and Gaertner (2012) studied the four countries jointly, whereas, Mwega (2011) and Mugume (2010) studied Kenya and Uganda, respectively. The study's results show that competition in the banking sector in the four countries is low. The socio-economic and structural factors are given as being behind the lack of competition in the four countries. Studies also suggested that market concentration is a major determinant of bank profitability in Africa (Nonye, 2012 for Nigeria; Nabieu, 2013 for Ghana).

In general, the international evidence on competition presented in Africa includes a small number of large African countries (Schaeck et al., 2009). Furthermore, studies do not account for the regulatory and institutional factors that are likely to shape competition in countries characterized by a variety of imperfections (caused by a lack of development, weak institutions, governance, and barriers to entry) (Classesns & Laeven, 2004).

Studies Conducted in the Ethiopian Banking Sector

Muir (2012) referred Ethiopia's banking system as "weird" and it's like a throwback to an earlier Africa, the Africa of the 1970s or 1980s. The reason cited by him was related to the high concentration and, hence, the structure of the sector. He stated that the banking system is dominated by two big state-owned banks accounting more than 50% of all lending. Muir's argument also extends towards the

ownership structure of Ethiopian banks. He cited that the dominant state ownership revealed in Ethiopia is "weird" phenomenon as compared the scarce existence of banks all over Africa.

In the Ethiopian context, the high-concentration aspect seems a more general truth than a research topic inviting further investigations. Bank and financial sector-related studies usually cite the concentration of the Bank industry as the area deserves attention. However, very limited studies instituted to provide in-depth analysis on the extent of concentration and its impact on bank performances. A notable attempt in such regard is by Lelissa (2007), who has measured the banking concentration using HHI and k-bank (K1, 2). He has found that the Ethiopian banking system is highly concentrated and dominated by the state-owned bank. However, the study lacks to test the impact of such result on the performance of banks.

On the other front, the empirical works in foreign countries reviewed previously have supported either the SCP or efficiency or both paradigms. However, there is lack of such studies in the context of Ethiopia. Bank-related studies in Ethiopia can be classified into - performance assessment related, related to the financial liberalization, and focused on efficiency analysis.

Performance related studies witnessed the positive trend in bank performance indicators. Study of such a kind includes Jenber, (2001), who assessed developments in market share, balance sheet, capital adequacy, and profitability using data for 1997/97–1999/00. The study pointed out that profitability of the banking industry in general was high in the study period and profitability of most private banks in particularly was encouraging. The other variant of study with regard performance is the attempt to segregate variables impacting bank performances. For instance, studies of Kapur (2009), Benti (2007), Abera (2011), and Nigussie (2012) examined either of the bank-specific, industry-specific, macro-economic, or all of the three factors affecting bank profitability in Ethiopia. In terms of variable selection, the studies have used capital strength, bank size, gross domestic product, operational efficiency, and asset quality. Some of the studies, however, are focused on private banks and the public banks, which constitute the high share of the industry, were not in the domain of the study. Methodologically, the studies have used multiple linear regression techniques to assess impact of selected variable on the profitability of banks. An exception in such regard is Benti (2007), who has used panel data GMM estimator to assess the impact of the stated variables on private banks' profitability performance. Nonetheless, the analysis is done excluding the stated-owned bank.

Bank reform-related studies seem to have similar concerns with regard to the gradualism and incomprehensive liberalization measures of the 1990s. Therefore, most of them are intended to indicate for a great need for additional market-oriented reforms to further enhance the sector's role. For instance, Geda (2006) assessed empirically the pre- and post-reform performance of the commercial banks in Ethiopia. He showed that the financial sector reform has brought lot of changes to the Ethiopian banking industry and criticized the slower pace at which the reform is moving on. Bezabeh and Desta (2014) also suggested the additional policy initiatives to be undertaken by the government to activate the sector. These include: a) reversing the decision prohibiting foreign banks from investing in the country, b) fully privatizing the state-owned commercial banks, c) allowing market forces to determine interest rates and the exchange rate of the Ethiopian currency, Birr (ETB), and d) upgrading the regulatory and supervisory capacity of the National Bank of Ethiopia to facilitate efficiency in the banking market. However, methodologically, the studies are qualitative descriptions supported by trend or point in time data on selected indicators like deposit, loans, etc.

On the efficiency front, studies are focused on commonly used efficiency measures like expense management or overhead control etc. ADB (2011) report shows that the traditional method of approaching the efficiency measurement issue of financial firms such as banks is the financial-ratio analysis, which has some major drawbacks. For instance, Berger (2009) mentioned that ratio analyses do not control for individual bank outputs, input prices, or other exogenous factors facing banks in the way that studies using modern efficiency methodology do, may give misleading results. Therefore, the report recommends for managers of banks and policy maker to search alternative tools (such as DEA) that compensate for the drawbacks in financial ratio analysis (ADB, 2011). A breakthrough in such front was the study of Rao and Lakew (2012) who examined the cost efficiency and ownership structure of commercial banks in Ethiopia

using DEA and Tobit models. The study found that the average cost efficiency of state-owned commercial banks over the period 2000-2009 is 0.69 while that of the private commercial banks is 0.74. The aggregate cost efficiency of Ethiopian commercial banks is found to be 0.73. In addition, the study found little statistical evidence to conclude that the state-owned commercial banks are less cost efficient than the private commercial banks. Thus, ownership structure has no significant influence on the cost efficiency of commercial banks in Ethiopia. Similarly, Lelissa (2014) explored the efficiency level of Ethiopian Banks for the period of 2008-2012 using the DEA model and found a notable variation among banks in terms of level of efficiency.

Snapshot of Recent Trends of the Empirical Studies

Empirical investigation of the SCP follows a similar methodological framework across the various studies in different countries. Recent publications around the globe following similar methodological approach as in this research continue to result in mixed outcomes. For instance, Pawłowska (2016) find no evidence of the SCP hypothesis in the Polish Banking system while Çelik and Kaplan (2016) find a result supporting the modified efficient structure hypothesis in the Turkish banking sector. In Africa, a study by Ebenezer and Oladipo (2016) for the Nigerian Banking sector estimated a positive relationship between the bank performance (profitability) and market concentration supporting SCP. A similar study in Malysia by Ab-Rahim and Chiang (2016) offers support to the efficient hypothesis. There was also attempt to test the competition in the banking sector applying the Panzar-Rosse approach. Simatele (2015) using bank level data for the period 1997 to 2014 explored the competitive environment in the South African banking industry and found that South African banks operate in a monopolistically competitive market structure. Other studies also attempted to link market structure with industry growth. A study in such path includes Khan et al., (2016) whose results indicate that higher bank concentration may slow down the growth of financially dependent industries and recommends for regulatory cautions while pursuing a consolidation policy for the banking sector in emerging Asian economies. Likewise, some of the studies in developed countries like the United States investigated the impact of competition on cost and technical efficiency. The study by Bayeh et al., (2016) finds that market power, as measured by the Lerner index, increases US banks' overall cost and technical efficiency. A contrasting study by Chen et al., (2016) evidenced that an increase in the degree of bank competition leads to weaken the industry performance, especially during non-crisis period in the Taiwan banking sector. Integrating competition /market structure with efficiency, Alhasen and Asare (2016) estimated the technical and cost-efficiency scores of the Gahanian banks and found that competition exerts a positive influence on cost efficiency. A recent attempt, while this study is on progress, in the Ethiopian banking sector is done by Lera and Rao (2016) that explored the effect of concentration on the performances. Their study has focused on testing the four structural theories that results in support of the managerial efficiency version. Nevertheless, they still have used the quantitative approach and assumed that conduct of banks is a derivative of the industry structure. In addition, they have used limited control variables and most importantly ignored the regulatory factors in their models.

In sum, in spite of the level of economic development, studies in industry concentration are being widely conducted across the world. Studies methodologically follow the original SCP as well as alternative industry-competitiveness-assessment models. Nevertheless, the objectives in the studies remain closer.

Summary

The overall results of studies related to concentration-profitability relationship have been far from being indisputably conclusive. In other words, no unique conclusion can be drawn from the results of the existing studies because the opposite type of evidence of others has strongly challenged favorable empirical evidence produced by some studies. However, the discipline has enriched from the opposite or supplementary ideas coming from various scholars. The originators of the SCP hypothesis argue that better performance by large firms in an industry is a result of market concentration. This hypothesis faced a strong attack from those trusting efficiency as a source of better performance. Followers of the efficient structure hypothesis claim that market concentration is not accidental event but

is the result of superior efficiency of firms. Therefore, efficient firms managed to obtain a large market share. Hence, the positive and significant relationship between concentration and bank profitability should be considered from the efficiency point of view. This is because there no relationship between concentration and performance, but rather between market share and bank profitability.

On the other hand, the quiet life hypothesis has brought a new dimension via taking in to consideration the impact of market structure upon bank management's risk-return preferences. According to this, explanation bank management in concentrated market is highly sensitive about showing high profits and, therefore, has high tendency for a quiet life, the failure of explicit recognition of such behavior may produce weak or statistically insignificant relationship between the concentration and bank profitability evidences. Still, others like contestable market theory claim that barriers to market entry and exit are not prelude (if market is contestable), then, there is no basis for assessing a significant value to the market concentration variable in determining bank profitability. According to them, it is quite possible to have outcomes approximating those of perfect competition even though the number of actual competitors is quite small or concentration is quite high if the market is contestable.

With an attempt to change the direction of focus of the profit-concentration relationship, the NEIOs claim that individual industries offer the best opportunity to understand the competitive mechanisms at work. Unlike the empirical literature on SCP, which was primarily based on cross-section studies, the NEIO focuses on econometric testing of particular aspects of conduct in single industries with the objective of detecting market power or changes in the collusive-competition behavior of firms.

However, a detailed review of existing literature on the SCP relationship indicates that:

- the majority of studies employ a multiple linear regression model where a measure of bank performance (mostly profit) is regressed on market concentration variables (such as k-firm, HHI, etc.) along with some control variables.
- the empirical divergence between SCP and competing hypothesis is still not conclusive which is attracting a lot of research works across the world and recently in Africa.
- studies on SCP by and large are dominated by quantitative analysis with an exclusion of non-quantifiable variables such as related to conduct and/or those lack data (regulation).
- few studies have explicitly considered Ethiopia's banking performance using the structural approach (SCP or ESH). Nevertheless, the existing bank performance studies were not analyzed incorporating big banks in the industry with long period observation of banks using parametric and non-parametric methods, which are scarce in the Ethiopian context. Studies that used the structure model have also limited focus on other key variables like regulation, macroeconomic, and industry factors. They have also applied a quantitative approach and assumed conduct as being a derivative of the market structure. Hence, there was no attempt to explore the behavior of banks within the given structure, banking, and microenvironment.

References

Ab-Rahim R., & Chiang S. (2016). Market structure and performance of Malaysian banking industry. *Journal of Financial Reporting and Accounting, 14*(2), 158-177.

Alhassan, A., & Asare, K. (2016). Competition and bank efficiency in emerging markets: Empirical evidence from Ghana. *African Journal of Economic and Management Studies, 7*(2), 268-288.

Bain, J. (1951). The relation of profit rate to industry concentration, American manufacturing, 1936-1940. *Quarterly Journal of Economics, 65*(3), 293-324.

Bain, J. (1956). *Barriers to New Competition*. Harvard University Press, Cambridge, MA.

Bandt, O., & Davis, E. (2000). Competition, contestability and market structure in European banking sectors on the eve of EMU. *Journal of Banking and Finance, 24,* 1045-66.

Barth, J. R., Caprio, G., & Levine, R. (2001). *The regulation and supervision of banks around the world: A new Database,* In Litan, R., and Herring, R., eds, Brookings-Wharton Papers on Financial Services.

Bayeh, A., Burlacu, R., Bitar, M., & Walker, T. (2016). Competition, Securitization, and Efficiency In U.S. banks. Retreived from http://febs2016malaga.com/wp-content/uploads/2016/06/2CompetitionSecuritization.pdf accessed on January 2016.

Benti, Y. (2007). Determinants of Private Bank Profitably: Determinants of Private Banks' Profitability in Ethiopia: Panel Data Evidence, Ethiopia.

Berger, A. (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.

Berger, A., & Hannan, T. (1989). The price-concentration relationship in banking. *Review of Economics and Statistics, 71*, 291-299.

Berger, A., & Hannan, T. (1992). The price-concentration relationship in banking: A reply. *Review of Economics and Statistics, 74,* 376-379.

Berger, A., & Hannan, T. (1993). Using Efficiency Measures to Distinguish among Alternative Explanations of the Structure- performance Relationship in Banking, Federal Reserve Board Working Paper.

Berger, A., & Humphrey, D. (1997). Efficiency of financial institutions, international survey and directions for future research. *European Journal of Operational Research, 98,* 175-212.

Berstain, S., & Fuentes, R. (2005). Concentration and Price Rigidity: Evidence from the Deposit Market in Chile. Central Bank of Chile Working Papers, No. 311.

Bezabeh A., & Desta, A. (2014). Banking sector reform in Ethiopia. *International Journal of Business and Commerce, 3*(8), 25-38.

Bikker, J., & Haaf, K. (2002a). Measures of competition and concentration in the banking industry: A review of the literature. *Economic and Financial Modelling,* 1-46.

Bourke, P. (1989). Concentration and other determinants of bank profitability in Europe, North America and Australia. *Journal of Banking and Finance, 13,* 65-79.

Casu, B., & Molyneux, P. (2003). A comparative study of efficiency in European banking. *Applied Economics, 35,* 1865-76.

Casu, B., Cirardone, C., & Molyneus, P. (2004). Productivity change in European banking: A comparison of parametric and non-parametric approaches. *Journal of Banking and Finance, 28*(10), 2521-2540.

Çelik, T., & Kaplan, M. (2016). Testing the Structure-Conduct-Performance Paradigm for the Turkish Banking Sector: 2008-2013. *International Journal of Economics and Financial Issues, 6*(4), 1625-1631.

Chen, H., Chuo, Y., Chang, J., & Yu, S. (2016). Does banking competition improve industry performance? *Evidence from Taiwan, Journal of Informatics and Data Mining, 1*(3:16).

Chirwa, E. (2001). Market Structure, Liberalization and Performance in the Malawian Banking Industry, AERC Research Paper 108, Nairobi, African Economic Research Consortium.

Chortareas, G., Garza-Garcia, J., & Girardone, C. (2009). Banking Sector Performance in Latin America: Market Power versus Efficiency, Centre for Global Finance, Working Paper Series No. 01/09.

Civelek, M. and Al-Alami, M. (1991). An Empirical investigation of the Concentration-Profitability Relationship in the Jordanian Banking System, Savings and Development*, 15,* 247-259.

Claeys, S., & Vennet, R. V. (2008). Determinants of Bank Interest Margins in Central and Eastern Europe: A Comparison with the West. *Economic Systems, 32,* 197–216.

Coelli, T., Rao, D., O'Donnell, C., & Battese, G. (2005). *An introduction to efficiency and productivity analysis*. Springer, New York.

Demsetz, H. (1973). Industry structure, market rivalry and public policy. *Journal of Law and Economics, 16*(1), 1-9.

Ebenezer, A., & Oladipo, E. (2016). Relevance of structure, conduct and performance paradigm in the Nigerian banking industry. *Journal of Economics and Sustainable Development, 7*(19), 2016.

Evanoff, D., & Fortier, D. (1988). Reevaluation of the structure-conduct: Performance paradigm in banking. *Journal of Financial Services Research, 1*(3), 277-294.

Fosu. S. (2013). Banking competition in Africa: Sub-regional comparative studies. Working paper: 12/13, University of Leicester, UK.

Gale, B., & Branch, B. (1982). Concentration Versus Market Share: Which Determines Performance and Why Does it Matter?, *The Antitrust Bulletin, 27*(Spring), 83-103.

Geda, A. (2006). The Structure and Performance of Ethiopia's Financial Sector in the Pre- and Post-Reform Period with a Special Focus on Banking UNU-WIDER, Research Paper No. 2006/112, united nations university

Gilbert, R. (1984). Bank market structure and Competition: A survey. *Journal of Money, Credit and Banking, 16*, 617-45.

Goddard, J., Molyneux, P., & Wilson, J. (2001). *European Banking: Efficiency, Technology and Growth.* John Wiley and Sons, England.

Goldberg, L., & Rai, A. (1996). The structure-performance relationship in European banking. *Journal of Banking and Finance, 20,* 745-771.

Gonzalez, F. (2005). Determinants of Bank Market Structure: Efficiency and Political Economy Variables. Fundacion de las Cajas de Ahorros, Working Paper No. 219.

Gual, J. (1999). Deregulation, integration and market structure in European banking.

Hahn, F. (2005). Testing for Profitability and Contestability in Banking. Austrian Institute of Economic Research, WIFO Working Paper, No. 261.

Jenber (2001). Banking Sector: Recent Developments in Market Share, Balance Sheet, Capital Adequacy and profitability. BIrritu No. 75.

Lelissa, T. (2007). The Impact of Financial Liberalization on the Ownership, Market Structure and Performance of the Ethiopian Banking Industry (Masters Thesis, Addis Ababa University).

Lera, D., & Rao, P. (2016). Market structure, efficiency, and performance of the Ethiopian banking sector. *India Journal of Research, 5*(1).

Mason, E. (1939). Price and production policies of large-scale enterprise. *American Economic Review, 29*(1), 61-74.

Maudos, J. (1998). Market structure and performance in Spanish banking using a direct measure of efficiency. *Applied Financial Economics, 8*(2), 191-201.

Molyneux P. (1993). Structure and performance in European banking. Doctoral Dissertation University of Wales, Bagnor.

Molyneux, P., & Forbes, W. (1995). Market structure and performance in European banking. *Applied Economics, 27*, 155-159.

Molyneux, P., & Thorton, J. (1992). Determinants of European bank profitability: A Note. *Journal of Banking and Finance, 16,* 1173-78.

Moore, R. (1998). Concentration, Technology, and Market Power in Banking, Is Distance Dead? Federal Reserve Bank of Dallas Financial Industry Studies, December, pp. 1-10.

Muir, D. (2012). A short primer on the Ethiopian banking system. Retrieved from http://noelmaurer.typepad.com/aab/2012/01/a-short-primer-on-the-ethiopian-banking-system.html

Negussie, H. (2012). Determinants of banks profitability: An empirical study on Ethiopian private. Commercial Banks, Master's Thesis unpublished, Addis Ababa University, 2012

Neven, D., & Röller, L. H. (1999). An aggregate structural model of competition in the European banking industry. *International Journal of Industrial Organization, 17,* 1059-1074.

Panzar, J., & Rosse, J. (1987). Testing for "Monopoly" Equilibrium. *The Journal of Industrial Economics, 35,* 443-456.

Park, K., & Weber, W. (2006). Profitability of Korean Banks: Tests of Market Structure versus Efficient Structure. *Journal of Economics and Business, 58*(3), 222-239.

Pawłowska, M. (2016). Determinants of profitability of polish banks: The role of foreign banks. *Econometric Research in Finance, 1*(1).

Peltzman, S. (1977). The gains and losses from industrial concentration. *Journal of Law and Economics, 20*(October), 229-263.

Pilloff, S., & Rhoades, S. (2002). Structure and profitability in banking markets. *Review of Industrial Organization, 20*(1), 81- 98.

Punt, L., & M. van Rooij (2001). The Profit-Structure Relationship and Mergers in the European Banking Industry. DNB Staff Reports, No. 58, De Nederlandsche Bank.

Sathye, M. (2005). Market structure and performance in Australian banking. *Review of Accounting and Finance, 4*(2), 107-122.

Shepherd, W. (1986). Tobins'q and the structure-performance relationship: Comment. *The American Economic Review, 76*(5), 1205-1210.

Short, B. (1979). The relation between commercial bank profit rates and banking concentration in Canada, Western Europe and Japan. *Journal of Banking and Finance 3,* 209-219.

Simatele (2015). Market structure and competition in the South African banking sector. *Procedia Economics and Finance,* 30(2015), 825-835.

Smirlock, M. (1985). Evidence on the (non) relationship between concentration and profitability in banking. *Journal of Money, Credit and Banking, 17*(1), 69-83.

Yu, P., & Neus, W. (2005). Market Structure, Scale Efficiency, and Risk as Determinants of German Banking Profitability. University of Tubingen, 294.