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# Market Structure, Efficiency, and Performance of the Ethiopian Banking Sector

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**ABSTRACT**

This article analyzes the effect of concentration and market structure on the efficiency and performance of Ethiopian commercial banks using the secondary data obtained from NBE for the period of 1990-2013. Using three regression models the study evaluated the SCP and EFS using the four hypotheses designed by Berger and Hannan (1993: SCP, RMP, TE and SE Hypotheses.

The findings showed that performance is positively affected by better technical efficiency, higher market share and large bank size also reduced market concentration and improved competition will do greater good in perking up the performance of banks as it still is observed oligopolistic.

**KEYWORDS**          Ethiopia, Market structure, Efficiency, Performance, Banking

## Introduction

The effect of bank concentration and competition on banks performance can have significant policy insinuation. This article tries to analyze the effect of banks concentration and market structure on their performance and efficiency

In the last two decades the Ethiopian financial industry has gone through various changes which includes of the improvement in management information system through information communication technology and the influence of globalization on the structure, size and scope of the Ethiopian banking sector has been very high. After the 1994 financial sector reform, the Ethiopian banking sector has entertained the introduction of private banks in the sector which was dominated by government banks. These changes in banking regulation have increased both the number of private banks involved in the banking sector and also the number of branches during the past decades.  The emergence of private banks has increased the completion in the banking industry, the level and types of financial services and the market structure of the banking industry which intern impacted the scale banks operational efficiency and competitiveness.

The modern banking system in Ethiopia was first introduced in 1905 by the Emperor Minilik II during which bank of Abyssinia was inaugurated in 1906. Bank of Abyssinia was the first indigenous bank in Africa and established by an official decree on August 29, 1931 with capital of £750,000. Before the bank of Abyssinia is replaced by bank of Ethiopia in 1931, the bank managed to expand its branches in various parts of Ethiopia. In the earlier periods of the Ethiopian banking history, the sector was all open to foreign banks to operate and invest in Ethiopia. This resulted in the opening of Barclays bank which came with British troops in 1941. In the following years Banco Di Roma and Banco Di Napoli s.c have obtained the license to operate in Ethiopia.

According to World Bank report (2013) total bank assets constitute 25% of the total GDP in Ethiopia which clearly indicates how significant the sector is to the overall economy. The report also marks the 1.7% professionals per bank which is slightly better than the figure reported in neighboring coun-

tries like Kenya but below Uganda and Tanzania. Ethiopia is the country where one hundred thousand individuals share 0.02 banks and where 84% of the banking sector is dominated by five banks of which the government owned banks take 61% (World Bank 2013). It is there for the extent of effort required by the banks regarding resource mobilization and the role they can play in regional imbalance is immense and needs greater effort and efficient resource management.

### 1.2 Review of Related Literature

The SCP or collusion hypothesis states that market structure influences the conduct or behavior of the firm through pricing and investment policies which on the other hand affects corporate performance. Bourke (1989) found a positive relationship between bank profitability and market concentration in Europe, North America and Australia. This is supported by the finding of Maudos and De Guevara (2004) which showed a positive and statistically significant relationship between concentration and bank interest margin for the period of 19934-2000. Also a positive relationship between concentration and profitability was found worldwide by Demirguc-Kunt and Huizinga (1999) in Canada by Short (1979) and in Europe by Molyneux and Thornton (1992).

In contrast to the above findings, based on the study conducted on 2700 state banks in USA Smirlock (1985) found that market concentration does not explain bank profitability. And also Goldberg and Rai (1996) on the study conducted based on the samples taken from large banked in eleven European countries did not find any positive relationship between concentration and bank performance for the period of 1988-1991.

Moore (1998) evaluated the effect of advanced communication technologies on banks to serve distant customers. These technologies such as tele-banking and internet banking helped the bank managers to reach distant customers. By using both the univariate and multivariate regressions he tried to analyze the changes in concentration ratio and bank profitability and found that regardless of the changes in technology market concentration had positively affected the performance of banks.

Tregenna (2009) assessed the effects of several variables such as market structure, bank size and operational efficiency on the profitability of the American banks for the pre-crises period (1994-2005). Interestingly, the findings showed there is no strong correlation between operational efficiency and bank profitability rather the main driving force behind bank profitability was found to be concentration. He argued that the high profit in the US banking sector in the pre-crises period was basically influenced by concentration not through efficient performance.

Claeys and Vander Vennet (2008) used SFA and DEA to analyze the factors which affect the bank interest margins in the Central and Eastern European countries. They tried to investigate empirically whether it is the improvements in efficiency or reduced competition which is causing bank's high profit margin. They found the existence of SCP hypothesis in these countries and stated that higher operational efficiency did not yield improvements in profit margin rather it is the lack of competition that is deriving the bank profits.

### 1.3 Data and Methodology

Berger and Hannan (1993) designed one of the most prominent research methodology which examines the relationship between market structure and performance under the SCP and EFS based on four hypotheses which includes SCP hypothesis, RMP hypothesis, technical efficiency hypothesis and the scale efficiency hypothesis to assess the effect market concentration and efficiency have on bank performance.

### 1.3.1 Model Specification

The fundamental framework to test the potential relationship between market concentration and performance under the structure conduct performance and the efficient market structure hypothesis was designed by Berger and Hannan in 1993. Their methodological frame work was used to test four basic hypotheses. These are the traditional SCP hypothesis, the RMP hypothesis, the technical efficiency hypothesis and the scale efficiency.

The above four hypotheses are tested using the empirical model below to see the market behavior of the Ethiopian banking industry.

Model I

$$\dot{p} = \alpha + \beta_{con}CONC + \beta_m M + \beta_{EFF}E + \beta_{SEFF}E + \sum_{i=1}^{n} \lambda_i z_i + \varepsilon$$

Where; pi is the measure of performance (profitability: net interest margin) of the $i^{th}$ bank, β is the estimated coefficient of (CONC) market concentration measured using the HHI , (MS) market share, (TE) technical efficiency and (SE) scale efficiency. λ is a vector of i control variables  λ is the estimated coefficient of the control variables and ε is the error term.

The SCP hypothesis is accepted if $\beta_{con}$ is greater than zero and statistically significant and $\beta_{ms}$ equals zero and the efficient structure hypothesis is accepted if $\beta_{con}$ and $\beta_{ms}$ are equal to zero and $\beta_{EFF}$ and $\beta_{SEFF}$ have values greater than zero and statistically significant. If RMP holds, the value of βms is positive and statistically significant.

Model II

$$MS_i = \alpha + \beta_{EFF} TE + \beta_{SEFF} SE + \sum_{i=1}^{n} \lambda_i z_i + \varepsilon_i$$

Model III

$$CONC_i = \alpha + \beta_{EFF}TE + \beta_{SEFF}SE + \sum_{i=1}^{n} \lambda_i z_i + \varepsilon_i$$

The relationship between market structure and efficiency establish that efficient firms will gain market share and will also responsible for higher market concentration. Therefore, in the

above two equations the $\beta_{SEFF}$ and $\beta_{EFF}$ are both positive and statistically significant. The EFS hypothesis will be valid if more efficient firms are more profitable and have more market share.

The proxy for technical and scale efficiency of the banks are obtained from the BCC technical and scale efficiency scores obtained from main paper based on intermediation approach as it was applied in the chapter

The secondary data of all variables except the efficiency scores is obtained from unbalanced cross-sectional time series panel data of audited financial statements compiled in NBE for the last twenty four years from 1990-2013.

### Table 1: Predictors

| Variables | Definition | Expected sign |
|---|---|---|
| TE | CCR Technical efficiency (intermediation approach) | |
| SE | BCC DEA estimated score from previous section. | |
| ROA | Return on total asset | Positive |
| CONC | HHI (total deposits) | Positive |
| CAP | The ratio of equity capital to total asset. | Positive |
| LQ | This is the ratio of liquid assets to deposits. | Negative |
| AQ | The ratio of nonperforming loans to total loans. | Negative |
| MS | The ratio of total bank deposit of each in relation to the sum total of all deposit banks in the sample. | Positive |

### 1.4 Results and Discussion

The analysis presented on table 1.2 shows the result of the regression analysis. The regression result excluded some variables as they caused multicollinearity and the exclusion resulted in

### Table 2: Regression results (Equation I)

| | Coefficient | T | sig. | VIF |
|---|---|---|---|---|
| (Constant) | -.102 | -1.625 | .122 | |
| TE | .035 | 2.751 | .014** | 1.717 |
| SE | .001 | .014 | .989 | 2.719 |
| CAP | .026 | .523 | .608 | 8.346 |
| BS | .009 | 2.261 | .037** | 7.678 |
| MS | .018 | 2.392 | .029** | 8.591 |
| CONC | -.016 | -1.535 | .143 | 8.254 |
| R square | 0.722 | | | |
| Adj R sq | 0.624 | | | |
| D-W | 1.768 | | | |
| F-stat | 7.359 | | | |

Source: Own computation

(Dependent variable: ROA   predictors: TE, SE, CAP, BS, MS, HHI, and t-values indicate coefficients at significant level of 1%, 5% and 10 %.)

The results above are based on equation I which assess the effect of technical efficiency, scale efficiency, market share, concentration and other control variables such as capital adequacy and bank size on ROA.

Based on the regression, technical efficiency has a positive and statistically significant effect on bank's performance. This implies that technically efficiency is one of the deriving factors in improving bank's performance which suggests that the more

technically efficient the bank is the more profitable they become. The variable representing concentration has negative which suggests that the performance of the Ethiopian banking industry can be improved by escalating competition and reducing market concentration ratio even though the values assigned to concentration has statistically insignificant relationship with performance. This provides evidence to reject the SCP hypothesis in the Ethiopian banking sector which further shows the collusive power of larger banks do not necessarily influence performance.  The SCP states that a positive correlation between profitability and market concentration shows lack of competition in the banking market. The collusive behavior firms can be associated to various elements not just to the prices they set for their services rather it is about the most dominant bank in the country (CBE). Contrary to this, the positive and statistically significant values of market share provides evidence to the existence of RMP hypothesis in Ethiopia suggesting that firms with higher market power or market share exhibit better operational performance than those with smaller market size. The coefficient of scale efficiency and capital adequacy are observed to have positive but statistically insignificant value indicating that an increase in scale of operation and capital strength do not significantly influence bank's operational performance.

Therefore, improvements in technical efficiency, superior bank size and higher market shares are the variables that define the performance of the Ethiopian commercial banks.

**Table3: Regression Result (Equation II)**

|  | Coefficient | T | sign. | VIF |
|---|---|---|---|---|
| (Constant) | 1.789 | 1.138 | 0.269 |  |
| TE | -0.743 | -2.12 | .047** | 1.359 |
| SE | 1.111 | 0.866 | 0.398 | 2.59 |
| CAP | -4.192 | -4.095 | .001* | 3.659 |
| BS | -0.139 | -1.717 | 0.102 | 3.442 |
| R square | 0.88 |  |  |  |
| Adj R square | 0.855 |  |  |  |
| F-stat | 34.865 |  | 0.000 |  |

Source: own computation

(Dependent variable: MS and predictors: TE, SE, CAP, BS and t-values indicate coefficients at significant level of 1%, 5% and 10 %.)

The result on table 3 is based on equation II which shows technical efficiency, bank size and capital adequacy have negative and statistically significant effect on increasing the market share of the banks which is quite the contrary to the theoretical belief. Scale of operation plays positive but insignificant role in increasing the market share of the banks as the values reported for SE is statistically insignificant. Also the negative coefficient observed on concentration variable again supports the claim that the Ethiopian banking sector does not follow the SCP hypothesis.

An interesting fact that can be observed from the table above is an increase market share or power does not necessarily improve operational efficiency of banks rather increased market share creates inefficiency problems due inefficient management of which is observed and discussed as the Ethiopian banks lack managerial efficiency Another interesting fact is the relationship between bank size and capital adequacy and the effect they have on banks in increasing market share. As market share is defined in this paper as the ratio of individual bank deposits to total bank deposits, expansion in branch and investments in fixed assets do not necessarily increase customer base to affect the level of deposits.

**Table4: Regression Result (Equation III)**

|  | Coefficients | t | Sig. | VIF |
|---|---|---|---|---|
| Constant | 2.91 | 2.59 | 0.018 |  |
| SE | 0.26 | 0.283 | 0.78 | 2.59 |
| TE | 0.266 | 1.062 | 0.301 | 1.359 |
| BS | -0.242 | -4.161 | .001* | 3.442 |
| CAP | -1.472 | -2.011 | .059*** | 3.659 |
| R square | 0.875 |  |  |  |
| Adjusted  R square | 0.849 |  |  |  |
| F-stat | 33.311 |  | 0.000 |  |

Source: Own computation

(Dependent variable: CONC and predictors: TE, SE, CAP, BS and t-values indicate coefficients at significant level of 1%, 5% and 10 %.)

As can be seen from the regression results above there exists a negative and significant relationship between technical efficiency and market share or power which might suggest that efficiency of firms is not the necessary requirement to earn higher market share. Therefore, an increase in market share in the banking sector could be explained by variables other than technical efficiency. Meanwhile, bank's scale of operation has positive but statistically insignificant influence on market share and market concentration. This shows that bank's scale of operation does not have any influence in determining banks market share and concentration. i.e. more branches do not necessarily generate proportional number of new customers and deposits.

1.5 Conclusions

The three regression model result suggested that improvements in technical efficiency, higher market share and larger bank size can significantly improve the performance of commercial banks.

Concentration measures have shown negative and statistically insignificant relationship with performance suggesting that intensifying competition and reducing market concentration could improve bank's performance and from this point of view the RMP hypothesis could suit the banking sector better.

The negative and statistically insignificant correlation observed between concentration and performance did not provide sufficient evidence to reject the SCP hypothesis. Therefore, reduced market concentration and improved competition will do greater good in perking up the performance of banks as it still is observed oligopolistic.

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