

Determinants of Net Interest Margin in the Ethiopian Banking Industry

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Abstract Determinants of Net Interest Margin (NIM) of commercial banks vary from economy to economy due to variation in country, industry and firm specific factors. This study aims to assess and identify the determinants of NIM in the Ethiopian banking industry. It mainly used unbalanced panel data collected from annual reports commercial banks and the National Bank of Ethiopia for the period 1997 to 2014. Specific macroeconomic data such as Real GDP and Inflation were collected from annual reports of Ministry of Finance and Economic Development. In addition, expert opinions are obtained from officials operating in both private and public banks and used to examine the effects of changes in internal and external factors on the performance of banks. Fixed Effect unbalanced panel data model is used for data analysis. The findings of the study indicated that cost efficiency, implicit interest payment, competition and scale efficiency consistently have positive and significant effects on NIM. On the other hand, liquidity risk and management efficiency has negative and significant effect on NIM. However, macroeconomic variables like inflation and gross domestic product do not seem to have significant effect on NIM. From this finding it is possible to conclude that both bank specific and industry factors are indispensable determinants of commercial banks' performance in Ethiopia. This, in turn, shows that operational efficiency and business growth are important areas of emphasis to register optimal return. Thus, bank executives, bank advisors and the monetary authority of Ethiopia need to focus on these two pillars performance to ensure optimal NIM in banks.

Keywords: net interest margin, banking industry, macroeconomic variables, banking performance

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1. Introduction

Finance is an integral part of any financial system and allows businesses to take advantage of opportunities. Financial institutions are important in managing and circulating fund within the economy. In doing so, financial institutions contribute towards economic growth and efficiency of a country through optimal allocation of resources. They provide platform for continuous restructuring of the economy through reallocating financial resources to the fastest growing sectors. For financial institutions to play their expected role, a well functioning financial system is a must, as a weak financial system is one of the reasons for many countries to remain poor [20].

In less developed economies like Ethiopia where the financial sector is largely dominated by banks¹, the effective and efficient functioning of the banking sector plays significant role in accelerating economic growth. In order to achieve the goal of efficient allocation of resources, the intermediation role of banks should be carried out at the lowest possible cost.² However, studies conducted to assess the effect of intermediation cost

(interest margin) of banks in different parts of the world show variations. The main reason behind this variation associated with both internal and external factors such as credit risk, liquidity risk, interest rate risk, cost efficiency, management quality, competition, inflation, GDP growth, etc. and change in any of these factors leads to change in interest margin and economic growth.

Increase in interest margin leads to growth in profitability and capital; but it may affect efficiency and competition, thereby economic growth. This indicates that Net Interest Margin (NIM) is one factor that affects economic efficiency. As a result, policymakers in different part of the world have been working to establish optimal intermediation cost that bring stable and efficient banking system, leading to economic efficiency and growth. However, Demirgüç-Kunt and Huizinga [9] revealed that decrease in NIM may not match with efficiency improvement of banks. It is, therefore, essential for policymakers and bank experts to look for those determinants of NIM that affect efficiency of banking business. This study is, therefore, intended to fill this research gap and identify the determinants of NIM in the banking industry of Ethiopia.

2. Overview of Banking in Ethiopia

Financial sector of Ethiopia has been registering nearly 15% annual growth for the past ten years (MoFED, 2014).

¹ In 2014, more than 85% asset share of the financial sector of Ethiopia is occupied by banks.

² Bernanke [4] expressed the cost of intermediation as the difference between costs incurred by borrowers and net return received by savers.

Banking industry is the largest of all financial sectors in Ethiopia both in resource and national contribution. It constitutes more than 86% of the finance sector and 90% of the total asset (NBE report, 2014). In 2014, there are sixteen private and two public owned commercial banks in Ethiopia. Overall asset of these banks reached more than Birr 350 billion and these banks have more than 2300 branches and created an employment opportunity for more than 35,000 people.

In 2006, the total number of branches of all banks has been only 322 and this figure is now increased by more than six folds and reached around 2,105 in 2014. Deposit and loan portfolio of the industry shows consistent growth during the same period. In 2005, deposit of the industry was around Birr 37 billion and rose to around Birr 292 billion in 2014, indicating an annual growth of 26%. In the same period, the return on asset (ROA), the return on equity (ROE) and the net interest margin (NIM) of the banking industry shows consistent growth with slight variations.

In 2002, the performance of the industry exhibited incidental change and became negative in all the three parameters because of losses recorded on CBE's record, which is an outcome of the overall adjustments and restructuring in the Bank's balance sheet.

Since 1997, the share of private banks has been consistently growing during the past consecutive years. Reports of the NBE indicated that the combined asset share of private banks was around 5.5% in 1997 and it increased to around 33% at the end of 2014. Similarly, in 1997, loans and advances and total deposit of private banks were around 5.3% and 4.9% respectively, and this figure increased to 35% and 32% percent at the end of 2014 respectively. Considering the share of these banks, the average performances of private banks have been encouraging and better than the industry average. However, unlike fast growth in number of firms, the market share of private banks is still low, indicating the need for further effort.

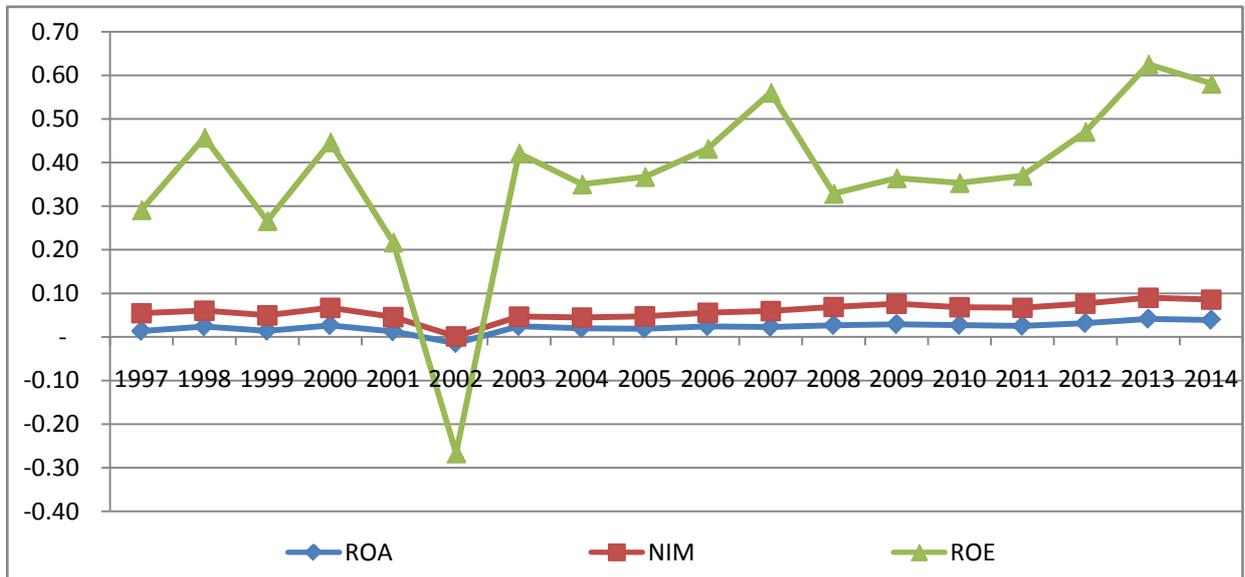


Figure 1. Profitability of the banking industry in the past one and half decades

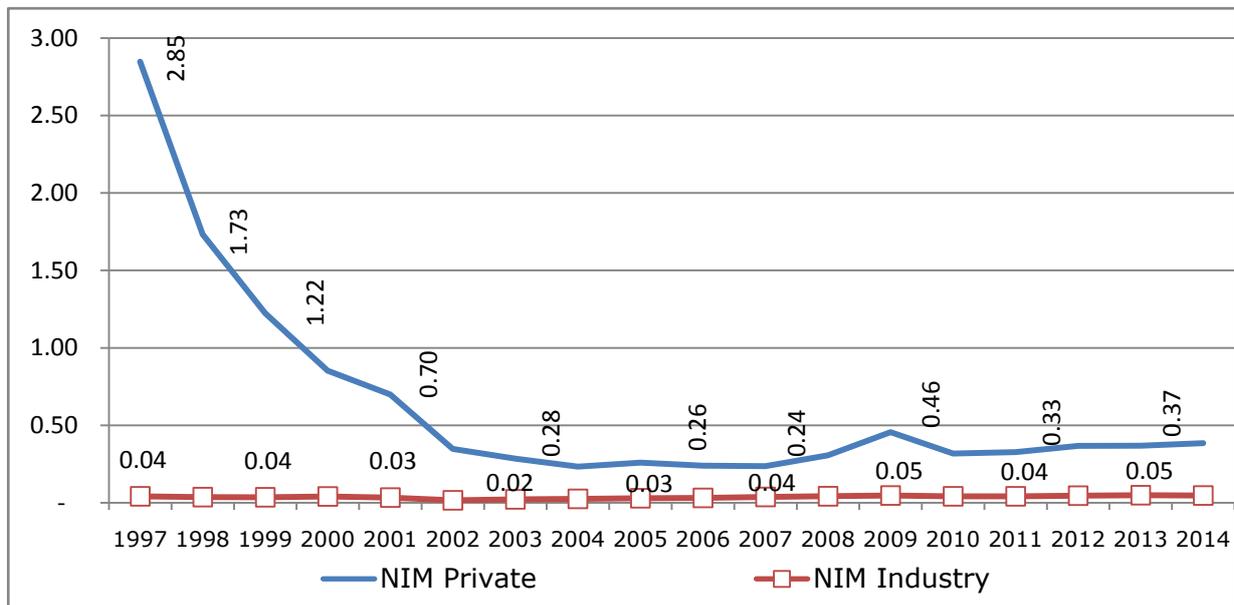


Figure 2. Performance of Private Banks measured by NIM

Figure 2 above indicated that NIM of private banks has been declining between 1997 and 2004 and started to be consistent and sustainable since 2004. This variation in the value of NIM may arise from differences in spread among banks. In addition, the variation in income between private banks and the industry still wide, indicating spread variation among private and public banks, i.e. private banks are borrowing and lending at higher rate than public banks.

3. Literature Review

Relatively large numbers of studies were conducted to assess the determinants of NIM. Some of the earlier studies used the two stage dealer model.³ This model assumes that banks are risk-averse financial intermediaries that accept deposits and make loans in a passive way [14]. As per this model, the mark-up of banks over market interest rates depends on four major factors, (1) risk aversion; (2) banking market structure; (3) the average size of bank transactions and (4) interest rate volatility (ibid). Here, the random nature of deposit and loan force banks to hold an inventory and thus takes the interest-rate risk. As the model ignores other internal and external variables, other authors like Angbazo [1] extended the model by incorporating default or credit risk and its interaction with interest-rate risk. Wong [27] further expanded the determinants NIM over a group of factors like degree of competition, market power, as well as operating expenses. In both cases, the authors underlined the existence of positive and significant relation between NIM and the stated factors except the degree of competition, which is the opposite.

Empirical review of literature revealed that both external (industry and macroeconomic) and internal (firm-level) factors determines the level of NIM, i.e. both factors are correlated with cost of intermediation of banks. However, there is variation in the determinants of NIM in different part of the world. Researches made in some Latin American countries showed that volatility in inflation, economic growth and interest rates negatively affects financial stability through intermediation costs and credit allocation [7]. Doliente (2005) assessed the determinants of NIM and identified that liquidity risk have negative relationship with NIM but is not significant. On the other hand, Saunders and Schumacher [25], and Liebeg and Schwaiger [18], found a significant and positive relationship between net interest margin and bank capitalization. Brock and Franken (2002), unlike the two, found a negative relationship between these two variables, explaining more capitalized banks tend to be more conservative in granting loans (resulting in lower margins) because more shareholder equity is at risk.

Liebeg and Schwaiger [18] and Naceur [21] assessed the determinants of NIM and identified significant and positive relationship between net interest margins and

operating expenses. Other studies made on the same business confirmed that high capital adequacy may reflect greater banking stability and contribute to lower interest rate margins [13,15]. Studies made on similar topic identified that leading banks have competitive power over other banks. As a result, market power variables take positive value. However, due to economies of scale, banks tend to lower interest margin [21]. As a result, unlike small banks, large banks generate lower return, which may be compensated by size.

Non-interest income usually has negative effect on interest margins. Banks tend to lower this margin if they compensate the lower interest incomes by higher commission or non-interest incomes. Commission incomes and interest incomes are complementary and correlation between net interest margins and commission become positive [11]. Other studies identified that NIM have positive relationship with interest rate risk (interest rate volatility) and bank interest margins [1,13,25]. However, Liebeg and Schwaiger [18] argue that higher interest rate risks increases the likelihood of default.

In a competitive banking system, variation between prices of loans and deposits, which is expressed by Net Interest Margin, is expected to be lower so as to foster greater efficiency (Rudra and Ghost, 2004). Inefficiencies in banking sector are likely to reflect absence of competitive environment [12]. Competition lowers bank interest rate spreads on policy market rates and increases the speed of adjustment for interest rates (Van Leuvensteijn et. al, 2008). Excessive competition may lead to excessive risk taking of banks, gambling, fragilities and instabilities, and ultimately lead to financial crisis (Stilgitz 2000).⁴ Demirguc-Kunt et al. (2003) indicated that higher interest margins is associated with increased regulation aimed at restricting bank operations and freedom to entry.

Angbazo [1] and Maudos and Fernández de Guevara [19] stated that good management picks high quality assets (low risk and high return assets) and low cost liabilities. Opportunity cost of keeping reserves must be compensated by setting higher loan rates. In their studies, Estrada et al. [11] and Gelos [12] have found positive coefficient for this variable. Higher economic growth creates investment opportunities through lending more and charge higher interest rates. Bernanke and Gertler (1989) have concluded that solvency of borrowers is countercyclical. Demirguc-Kunt and Huizinga [9] suggested that the relationship between bank profits and GDP growth varies between developed and developing countries. In a financial system where banking sector is large relative to GDP, banks have smaller profits margins and less profitable.

Inflation may increase or decrease interest rate and interest rate margin. In economies with high inflation, intermediaries will lend less and allocate capital less effectively, and equity markets will be small and less liquid [5]. Perry [23] stated that when inflation is anticipated, banks can adjust interest rates and operating expenses at a faster rate than inflation, thus making it possible to increase net revenue. However, unanticipated

³ Brock and Rojas Suarez [7] and Jude [16] used two-stage model to analyze the effects of explanatory variables on net interest margin. On the other side, authors like McShane and Sharpe (1985), Claeys and Vennet (2008), and Kasman et al. (2010) have used the extended one-step model of Angbazo [1] and Maudos and Fernandez de Guevara [19] to assess the determinants of NIM.

⁴ Competition and Net Interest Margin;
<http://www.imf.org/external/np/seminars/eng/2014/lic/pdf/Moyo.pdf>

inflation result in an ineffective adjustment of costs and hence the likelihood that costs rise faster than earnings leading to lower profit [2].

4. Research Methodology and Data

Both qualitative and quantitative research methods are used to assess the determinants of NIM. In addition, primary and secondary data, including bank financial performance indicators, macroeconomic indicators and professional opinions are used in the study. Major sources of data used for this study include financial reports of commercial banks, for bank specific variables, reports of the National Bank of Ethiopia, for industry variables, and reports of MoFEC, for macroeconomic variables. Besides, opinions of bank experts were collected from seven individuals selected from public and private banks. The data used for analysis covered a period between 1997 and 2014. Banks with less than three years of service were exempted from the data set. As a result, 16 of the total 18 commercial banks were included in the study. In addition, unbalanced panel data model is used to account the effects of data variation arising from years of service between different banks.

Studies use different models to assess the determinants of Net Interest Margin. However, this study used the extended to one-step model, which was developed by Angbazo [1] and later improved by Maudos and Fernandez de Guevara [19]. In this model, it is possible to use additional explanatory variables that are not mentioned in the initial model. Accordingly, list of explanatory variables examined in the study and their expected effect on NIM are presented in Table 1.

As stated in Table 1, expected effects of each variable are not the same. Credit risk has negative effect on net interest margin, as increasing non-performing loans decreases interest income. Liquidity is an opportunity cost for bank's profitability. Hence, liquid bank's net interest margin is expected to be lower. In most cases, equity

financing is considered to be more costly than debt financing, however, this is compensated by safety. As a result, positive values are expected for capital risk. In Ethiopia, interest rate has been increasing for the past successive years. Hence, banks with more sensitive asset has been generating more interest income, indicating positive value for interest rate risk. As the cost of operations increases, net income is expected to decrease. Negative value of cost efficiencies reflects this hypothesis.

Implicit interest payment is indeterminate as it could have positive or negative effect. Improvement in managerial efficiency is expected to have positive effect on NIM. Hence, positive value is assigned for this variable. High required reserves denote low interest income. Hence, the required reserve is expected to have negative impact on NIM. Dummy variable is introduced to isolate between private and public banks. However, priority was not given to this variable as both groups have advantages and disadvantages, which could lead to positive or negative impact. Since leading banks have competitive advantage over other banks, market power variable takes positive value. Competition leads to low interest income and increases cost of debt, which in turn leads to decrease in NIM and has negative correlation. Scale efficiencies are characterized by market share of assets; however, market share of loans is used for this study. It is argued that scale efficiencies lower cost and increase banks' NIM. As a result, positive value is expected for this variable.

Macroeconomic variables also play important role in the intermediation function of banks. The study is, therefore, incorporated selected macroeconomic variables considering their effect on lending and deposits interest rates of banks. In this regard, real growth rate of the economy is expected to affect NIM in either direction. Under positive real growth rate scenario, banks may not lend to riskier private sector or lend at higher rates. Inflation expectations lead banks to increase their interest rate, which cause the margin to increase. As a result, positive sign is expected for inflation.

Table 1. Variable description and expected effect on Net Interest Margin

Variables	Description	Expected Sign NIM
Dependent Variable		
Net Interest Margin (NIM)	Interest income minus interest expenses divided by total earning assets	
Independent Variables		
Credit Risk (CR)	Provision for loan losses divided by total loans	-
Liquidity Risk (LR)	Cash and due from accounts divided by total assets	-
Interest Rate Risk (IRR)	Sensitive asset minus sensitive liability divided by total equity	-
Capital Risk (CRK)	Total equity to total assets	+
Cost Efficiency (CE)	Total cost to total assets ratio	-
Implicit interest payment (IIP)	Non-interest expenses minus non-interest revenue to total earning assets	?
Managerial Efficiency (ME)	Earning assets to total assets ratio	+
Reserve Requirement (RR)	Required reserves at central bank to total earning assets	-
Dummy Variable (DUM)	One for private and zero for public banks	?
Lerner Index (LRI)	Total revenue minus total cost to total revenue	+
Scale Efficiency (MSL)	Bank loan to total industry loan	+
Inflation Rate (INF)	Annual inflation growth rate	+
Real GDP Growth (RGDP)	Annual Real GDP growth rate	+

On the basis of nature of the variables, three models are developed to assess and analyse the determinants of NIM. Model three used the maximum thirteen explanatory variables as potential determinants of net interest margin (NIM). Model one and two relied on bank specific and industry variables respectively. , the explanatory variables are equated against NIM as presented below.

$$NIM_{it} = \sum_{t=1}^n B_i (BSV_{it}) + \sum_{t=1}^n B_i (IV_{it}) + \sum_{t=1}^n B_i (MEV_{it})$$

Where: -

$\sum_{t=1}^n B_i (BSV_{it})$ – Sum of bank specific variables

$\sum_{t=1}^n B_i (IV_{it})$ - Sum of industry variables, and

$\sum_{t=1}^n B_i (MEV_{it})$ – Sum of macroeconomic variables.

Three related models were developed with different number of variables and characteristics. Model one associates NIM with bank specific variables and identifies the impact of each variable on NIM. It is expressed as:

$$\begin{aligned} NIM_{it} = & B_{it} + B_1 (CR_{it}) + B_2 (LR_{it}) + B_3 (IRR_{it}) \\ & + B_4 (CRK_{it}) + B_5 (CE_{it}) + B_6 (IIP_{it}) \\ & + B_7 (ME_{it}) + B_8 (RR_{it}) + E_{it}. \end{aligned} \quad 1$$

Model two included industry variables in model one and assesses the impact of both bank specific and industry variables on NIM. It is expressed as:

$$\begin{aligned} NIM_{it} = & B_{0it} + B_1 (CR_{it}) + B_2 (LR_{it}) + B_3 (IRR_{it}) \\ & + B_4 (CRK_{it}) + B_5 (CE_{it}) + B_6 (IIP_{it}) \\ & + B_7 (ME_{it}) + B_8 (RR_{it}) + B_8 (DUM_{it}) \\ & + B_9 (LRI_{it}) + B_{10} (MSL_{it}) + E_{it}. \end{aligned} \quad 2$$

Model three included macro variables such as inflation and RGDP in model two above to have broader view of

the model. As a result, the third model assesses the determinants of NIM using macro, micro and bank specific factors. It is expressed as:

$$\begin{aligned} NIM_{it} = & B_{it} + B_1 (CR_{it}) + B_2 (LR_{it}) + B_3 (IRR_{it}) \\ & + B_4 (CRK_{it}) + B_5 (CE_{it}) + B_6 (IIP_{it}) \\ & + B_7 (ME_{it}) + B_8 (RR_{it}) + B_9 (DUM_{it}) \\ & + B_{10} (LRI_{it}) + B_{11} (MSL_{it}) \\ & + B_{12} (RGDP_{it}) + B_{13} (INF_{it}) + E_{it} \end{aligned} \quad 3$$

Where: NIM_{it} – Net Interest Margin of bank i (i = 1...16) and year t (t = 1...17); CR – Credit Risk; LR – Liquidity Risk; IRR – Interest rate risk; CRK – Capital Ratio; CE – Cost Efficiency; IIP – Implicit Interest Payment; ME – Managerial Efficiency; RR – Reserve Requirement; LRI – Learner Index; MSL – Bank Size (Scale Efficiency); RGDP – Real Gross Domestic Product growth; INF – Inflation; and E_{it} – Error term.

5. Results of Descriptive Statistics

Results of descriptive statistics revealed that there is significant difference in standard deviation, min and max value of bank specific variables, indicating that banks behave differently and independently. Here the maximum deviation is observed among values of interest rate risk followed by management efficiency; and the minimum deviation is registered for cost efficiency and implicit interest payment. There is also slight variation among values of industry and macroeconomic variables. In this case, vale of competition varies from -1.9 to 0.70 and that of scale efficiency and inflation varies from 0.0 to 0.94 and 0.03 to 0.36 respectively. Results of the analysis show maximum deviation between data of interest rate risk (1.8) while minimum data variation was observed in case of cost efficiency (0.012) and real GDP growth (0.013).

Table 2. Summary of Descriptive Statistics

Variable	Observation	Mean	Std. Dev.	Min	Max
NIM	177	.0458154	.0157394	.0090063	.0914882
CR	177	.0473975	.0561164	.0000000	.3316871
LR	177	.2098577	.0889739	.0414103	.5233246
IRR	177	-.8658429	1.801787	-8.124577	5.316265
CRK	177	.1327360	.0704512	.0097602	.5060041
CE	177	.0491143	.0121050	.0179000	.0983561
IIP	177	-.0101905	.0317872	-.1712876	.1375522
ME	177	.6110582	.1396043	.2796221	.9262002
RR	177	.1188135	.0887704	.0017425	.5226865
LRI	177	.3384879	.2879484	-1.910573	.7047347
MSL	177	.1009616	.1875187	.0000000	.9470330
INF	177	.1396384	.1071177	.0280000	.3640000
RGDP	177	.1118870	.0128959	.0870000	.1260000

Source: Annual reports of commercial banks.

In addition, result of the analysis shows that credit and liquidity risk have a mean of 0.047 and 0.21 respectively, indicating credit and liquidity risk has been below the international and NBE standard of 5% and 15% respectively. In addition, reserve share of banks has been 0.11, which is above the 5% reserve requirement for banks. In all case, it is possible to conclude that commercial banks have been operating within the given threshold. However, the level of competition is 0.33, which is above 0.25, indicating low level of competition in the banking industry of Ethiopia.

6. Model Specification Tests

Inherently, linear regression cannot be directly used to estimate the value of variables, because the unknown parameters are not captured in the model. As a result, three different forms of regression models are commonly used with different assumptions in case of panel data. These are pooled regression or panel least squares (PLS), Fixed Effect Model (FEM), and Random Effect Model (REM). Panel Least Square (PLSM) has an assumption of no time series or cross-sectional effects. Fixed effect model (FEM), on the other hand, assumes that individual bank differences are captured by differences in the intercept parameters. Unlike the two, the random effect model (REM) treats individual firm differences as random rather than fixed.

In the case of panel least square (PLS), it is important to check for serial correlation, i.e., look for the possibility that the error is first order autoregressive (AR (1)). If the coefficient AR (1) is significant, it indicates the existence of serial correlation in the errors. This means the error term in each period contains a time constant omitted factor. If the model contains serial correlation, the PLS is likely to be biased and inconsistent. This bias arises from omitting a time constant variable, sometimes also referred to as unobserved heterogeneity bias. Such unobserved individual heterogeneity, however, can be appropriately modeled through fixed effect (FEM) and random effect (REM).

In line with the above facts, results estimation test show symptom of serial correlation among the errors. However, the data are normally distributed for all the variables. As a result, it is preferable to use either Fixed Effect Model (FEM) or Random Effect Model (REM) than Pooled Regression (PLS). Hence, Hausman test was conducted to decide between FEM and REM. Results of the test show that the “p” value of Chi-square test is significant, suggesting the null is rejected and fixed effect is redundant. Thus, it is possible to reject the null hypothesis that random effects are redundant and use FEM for further analysis. In addition, an option ‘robust’ is used to control the impact of Heteroskedasticity. Thus, FEM with robust cluster estimation (RCE) is used for this study. Outputs of robust cluster estimations (RCE) also show uniformity in terms of signs of all coefficients of PLS and FEM. In addition, correlation test was made to check for problem of multicollinearity. Results of correlation matrix revealed that there is no strong correlation between variables used in the study.

7. Determinants of NIM in Ethiopian Commercial Banks

Results of the study show that cost efficiency, implicit interest payment and competition have positive and significant effect on NIM in two of the three equations. However, liquidity risk and management efficiency has negative and significant effect. Analysis results indicate that microeconomic factors are more important to have changes on NIM and create dynamism than macroeconomic factors (Table 3).

Table 3. Robust Cluster Estimation Results of the Banking Industry

Variables	(1) NIM	(2) NIM	(3) NIM
CR	-0.0274 (0.0290)	-0.00621 (0.0254)	-0.00704 (0.0222)
LR	-0.0542** (0.0142)	-0.0340* (0.0118)	-0.0288* (0.0114)
IRR	-0.00107 (0.00122)	-0.000532 (0.000593)	-0.000745 (0.000563)
CRK	-0.0118 (0.0264)	0.0409 (0.0326)	0.0391 (0.0316)
CE	0.304* (0.126)	0.417** (0.120)	0.410** (0.0109)
IIP	-0.109* (0.0476)	0.202** (0.0637)	0.174* (0.0685)
ME	-0.0311 (0.0171)	-0.0473* (0.0171)	-0.0400* (0.0170)
RR	0.0247 (0.0203)	0.0379 (0.0185)	0.0276 (0.0162)
LRI		0.0432*** (0.00950)	0.0401*** (0.00947)
MSL		0.0509** (0.0145)	0.0533** (0.0137)
INF			0.0161 (0.0112)
RGDP			-0.0597 (0.127)
Cons	0.0592*** (0.0135)	0.0335** (0.0109)	0.0346 (0.0218)
N	177	177	177
R-sq	0.374	0.568	0.588
adj. R. sq	0.345	0.542	0.558
Rmse	0.0108	0.00900	0.00884

Legend: * p<0.05; ** p<0.01; *** p<0.001; Standard error in parenthesis.

Findings of the study show existence of various relationships between NIM and its determinants. Detail analysis of the findings and their implications to banks are discussed as follows.

Credit Risk: Results of the study revealed that credit risk has negative but insignificant effect on NIM, indicating it seems to have no impact on NIM. However, Maudos and Fernández de Guevara [19], and Brock and Franken [6] have found a positive and significant relationship between interest margins and credit risk in

Latin America. The result, however, is consistent with the opinion of bank experts who are arguing that the financial market of Ethiopia has large demand for finance, and most business sectors in Ethiopia are highly profitable. As a result, risks associated with credit are very minimal. In addition, banks with more problematic loan take necessary actions to achieve high NIM.

Liquidity Risk: Negative and significant relationship is identified between NIM and liquidity risk in all the three models. The result is consistent with the findings of Darkos (2003), Angbazo [1], etc., indicating liquidity position of banks has significant effect on NIM; and an increase in liquidity position lead to a decrease in NIM and vice versa. Hence, most banks try to minimize the amount of idle liquid asset and use most of their liquid asset to generate revenue. The finding is consistent with the hypothesis set and the views of different bank experts in the assessment.

Interest Rate Risk: During the past decade, the Ethiopian banking industry has experienced slight increase in interest rate. This may indicate that banks with more interest sensitive assets generate better income from interest rate growth. However, the negative relationship, though insignificant, indicates that banks with more interest sensitive assets have been registering low NIM. This may be due to regulatory measures and directives that are applied in the banking industry. However, Liebeg and Schwaiger [18] argue that higher interest rate risks will increase the likelihood of default.

Capitalization (Capital Risk): Banks with large capital face lower costs of borrowing and low risk of bankruptcy, which is helpful to set lower margins. Result of the regression, however, shows that capital ratio is insignificant in all case. Other studies report positive and significant relationship, including Kasman et al. (2010); Saunders and Schumacher, [25]; Angbazo, [1]; etc. This may support the view that equity financing is costly and needs to be recovered through charging higher interest on borrower. In addition, as per trust and safety role of banks, safe and healthy banks deserve to pay lower deposit rate, hence lowering cost and reaping higher margin. Yet, banks in Ethiopia do not seem to pass the higher cost of equity financing to clients. In addition, banks are raising capital to fulfill regulatory requirement, i.e., solvency regulations on lending activities. Thus, ensuring bank stability has no implications on cost of intermediation.

Implicit Interest Payment: Implicit interest payment has negative and significant effect on NIM under model one and positive and significant relationship in the case of model two and three. Negative and significant effect implies that banks have been charging high interest on loan. Results of the remaining two models are consistent with studies made by Angbazo [1], Saunders, and Schumacher, [25], etc. Change in the signs of the remaining two models indicate that banks in Ethiopia attempt to make extra payments to depositors and recover their cost through setting higher margin. Opinions of bank experts also goes with the findings that banks are paying extra cost to attract more deposit and compensate expenses with commission charges.

Management Efficiency: It has negative and significant effect on NIM in case of model two and three. The result is consistent with the findings of Angbazo [1],

Hawtrey and Liang [13], etc, indicating inefficient banks tend to have high costs, increasing charges and the NIM. Experts' opinions also confirm the views that bank management has significant role in determining the balance between profit earning asset and non-profit generating resources. It has also big role in allocating existing scarce resources for highly profitable sectors, given market dynamism of the industry. Most of the time, banks with better management succeed in registering better income and competing in the market. However, banks with inefficient management are still struggling to survive.

Reserve Requirement: Findings of the study show that reserve requirement has insignificant effect as expected. However, different studies report a positive and significant relationship, including Saunders and Schumacher [25], Maudos and Solis (2009), etc. The result may indicate that the effect of regulatory requirement is minimal in determining the performance of banks in Ethiopia. Most of the research participants, however, indicated that the regulatory requirement has forced banks to look for alternative use of fund; i.e., banks have been borrowing to offset the finance gap and support their operation.

Bank Ownership (Private and Public): Roles of public and private ownership of banks were assessed using a dummy variable. However, the result is insignificant, indicating other variables like liquidity risk, market power, efficiency, etc., are more important in the determination of NIM. In addition, the result may indicate that commercial banks have been using similar strategies in the same markets regardless of their ownership structure.

Learner Index: The study clearly shows that market power has strong impact on NIM of banks in Ethiopia. Positive and significant effect of learner index asserts that banks with market power possess price competitiveness and cost control. The finding is consistent with studies of Maudos and Guevara, [19], Khediri and Khediri (2011), etc. On the other hand, bank experts argue that due to rapid economic growth and high demand for finance, banks with market power are not exercising their power. According to these experts, the largest bank has been controlling the market for the last two decades and setting competitive price. However, due to high resource demand for finance from public investment, small banks, unlike the largest bank, are reaping higher benefit through charging higher interest rates on private investment.

Inflation: It is found insignificant in the determination of NIM, indicating changes in real interest rate has no effect in nominal interest rate. In most cases, an increase in inflation leads to increase in interest margin through the relationship between inflation and banks spread. Previous studies like Galos (2009) confirm that there is positive relationship between inflation and NIM. In economies with high inflation, intermediaries will lend less and allocate capital less effectively [5]. However, most of the experts emphasis that inflation encourages banks to generate higher income, but lower real income compared to the rate of inflation, as the inflation have not been anticipated in the industry.

Growth in Real Gross Domestic Product (RGDP): Economic growth plays important role in increasing individual income, which increases the ability to pay for consumption and increase savings. Result of the study

shows insignificant relationship between RGDP growth and NIM. Differing to the finding of the study, most bank experts argue that economic growth in Ethiopia has contributed to the expansion of lending and low risk of default. However, the result is consistent with the findings of Claeys and Vander Venet (2009) and others who identified that GDP growth has negative effect on NIM.

8. Conclusion and Recommendations

In this study, assessment was made to identify determinants of NIM, which is the ratio of net interest income to earning assets using panel data. Both qualitative and empirical technique is used in the study. Both internal and external factors that affect NIM of commercial banks are considered in the study. Estimation results of the study revealed that cost efficiency, implicit interest payment, competition, and scale efficiency have positive and significant effect on NIM. However, liquidity risk and management efficiency has negative and significant effect on NIM. On the other hand, credit risk, interest rate risk, capital risk, inflation and economic growth do not seem to have significant impact on banks' performance. The performance of commercial banks has not been affected by changes in macroeconomic variables mainly because they were not active enough to follow the economic dynamism and act accordingly. However, the finding of the study gives strong indication that quality of management and strategic road map has strong effect on the performance of banks. Banks with higher market share, in both deposit and loan, have also the power to set own margin and reap optimal return. On the basis of the findings of the study, it is possible to conclude that both internal and external factors have strong impact on the performance of commercial banks in Ethiopia. In order to register optimal return, it is important to set measures that help to minimize the impact of those factors constraining performance. In this regard, the study proposed the following specific measures.

- Results the study revealed that NIM is affected by cost efficiency. As a result, commercial banks are expected to work on reducing cost of operation. This may require improving service quality and efficiency through minimizing non-value adding activities and introducing modern banking technologies.
- Income diversification (implicit interest payment) is one of the key determinants of NIM, indicating diversification is important to enhance sources of income and maximize total revenue of commercial banks.
- Management efficiency is another important determinant of NIM, indicating problem of portfolio mix and asset allocation of banks. As a result, commercial banks are expected to enhance their capacity in asset management and resource allocation if they want to register optimal performance and goes with global and local economic and social changes.
- Market power has found to have a strong influence on NIM. In this regard, commercial banks are expected to focus on business growth, i.e.

increasing their capital, deposit and credit base through expanding customer base and raising additional share (capital), in addition to introducing all rounded, cost efficient and quality banking services.

In general, the findings of the study lead to an overall recommendation that commercial banks need to focus on operational excellence and business growth if they want to register optimal performance. Business growth contributes towards increasing credit volume and scale efficiency, which have indirect implication on NIM. In the same way, operational excellence minimizes risks of loss and increases the number of customers working with banks, which in turn contributes to higher NIM. In addition, these two pillars of operation are crucial to become sustainable and progressive in the business and attain maximum efficiency.

9. Limitations of the Study

Inability to access detail and organized information on the area of interest was one of factors affecting the quality of a research. In this case, it limited the research to focus on financial reports that were published before 2014. In addition, challenges of finance and time were other constraints limiting the study. In cases of gathering respondents' opinion, some bank experts were not cooperative because of undisclosed reasons. However, extra efforts were made to fill all these gaps and ensure the quality of the research.

10. Recommendation for Further Study

In this study, focuses were given only on identifying the determinants NIM in the Banking Industry of Ethiopian. Hence, further research is recommended to identify the extent to which market power, management efficiency and cost efficiency influences the profitability of commercial banks.

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