

# **An Econometric Analysis of the Nexus Between Banks' Sub-Sectoral Credit Allocation and Operating Profit: Evidence from Private Commercial Banks in Ethiopia**

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## **Abstract**

The purpose of this study was to investigate the link between private commercial banks' sub-sectoral loan and advance distribution and operating profit over the period 2010-2016 using unbalanced short panel. The paper was designed following post-positivist paradigm, correlational research design with the dimension of ex post control over variables; longitudinal time dimension; quantitative approach in depth; and deductive method of inquiry. Target population was all 16 private commercial banks in Ethiopia. From these, banks having seven years annual financial report from 2010 to 2016 were selected purposely. Comparison among Pooled OLS, fixed effect and random effect models was carried out to choose the best fitted model. Accordingly, a random effect was chosen. The regression results of random effects GLS revealed that credit distribution to domestic trade and service, manufacturing sector, and import and export has statistically positive effect on operating profit. On the other hand, credit to building and construction and transportation has statistically insignificant positive relationship with interest income. However, private banks' credit to agricultural sector has statistically insignificant negative association with operating profit.

**Keywords:** Credit Allocation, Operating Profit, Private Banks, Random Effect.

## **1. INTRODUCTION**

The financial sector is crucial to economic growth (Nkegbe & Ustarz, 2015). Most importantly, commercial Banks are core of this sector (Mohagheghnia & Shirgholami, 2013; Akpansung & Gidigbi, 2014; Masood, Ashraf, & Turen, 2015; Tsuma & Gichinga, 2016). Especially in developing economies like Africa, where capital markets are not very developed, the role of commercial banks is immense (Alu, Amidu, Osei, & Kuipo, 2014). Though commercial banks have many functions, the primary one is accepting deposits from surplus units and then providing loan from those deposits to different groups and economic sectors (Imoughele, Ehikioya, Ismaila, & Mohammed, 2013; Sheefeni, 2015; Andriani & Wiryono, 2015). This transformation of money from supply to demand side is not without return. Thus, commercial Banks charge interest, expecting to earn return (Antoine, 2015). So, Credit, the extension of money from the lender to the borrower, constitutes the largest single income-earning asset in the portfolio of most commercial banks (Olokoyo, 2011; Imeokpararia, 2013; Shahabuddin, Md, Alam, & Pervin, 2013; George et al., 2013; Ebi & Emmanuel, 2014; Damankah, Anku-Tsede, & Amankwaa, 2014). Although commercial Banks are expected to be socially responsible, support local communities and ensure adequate supply of credit to all legitimate sectors, the viability of these institutions shouldn't be jeopardized (Antoine, 2015). Therefore, they have to earn profit since it is a measure of success and the means of their survival and growth (Singh, 2015). And profitable banking system is better able to improve financial system stability and economic growth (Noman, 2015; Gyamerah & Amoah, 2015). In addition, researchers note that the sustainability of commercial banks is largely determined by their level of profitability. This profitability leads to increased wealth of investors (shareholders of banks) through higher dividends. In the same fashion, it also contributes to economic development of a country through the fact that the profits can be reinvested back, offering additional employment to the citizens of the country and increase revenue for the country through taxation (income tax and corporate tax) (Asantey & Tengey, 2014; Tsuma and Gichinga, 2016). Therefore, the role of commercial banks goes beyond the intermediation function, in that it also rewards the shareholders for their investment as a result of good financial performance, in turn encourages additional investment and brings economic growth (Sheefeni, 2015).

## **2. STATEMENT OF THE PROBLEM**

In finance literature, bringing economic growth and increasing wealth of investors are two folds while commercial banks provide credit. On the one hand, there is a general consensus that for economic growth to take place there should be strong support from the financial sector, particularly banks to provide credit (Mbulawa, 2015). Hence, the extent of literature related to Bank credit and economic growth is vast (Murty, Sailaja, & Demissie, 2012; Olusegun, Akintoye, & Dada, 2014; Yakubu & Affoi, 2014; Akpansung & Gidigbi, 2014; Ebi & Emmanuel, 2014; Oni, Akinlo, & Oladepo, 2014; Korkmaz, 2015; Oladapo, 2015). On the other hand, however, research on the nexus between Banks' credit allocation and operating profit of commercial banks is very limited, leaving a margin for investigation. According to Yudistira & Anggono (2013), research needs to be held to

analyze the effect of distribution of credit based on economic sectors on the operating profit of banks due to the volatility of economic sectors. Therefore, this study is carried out to fill this gap by examining the nexus between private commercial banks' sub-sectoral credit allocation and operating profit in Ethiopia using panel data.

### **3. OBJECTIVE OF THE STUDY**

The objective of the study is to investigate the relationship between private commercial banks' sub-sectoral credit distribution and operating profit over the period of 2010 to 2016.

### **4. IMPORTANCE/SIGNIFICANCE OF THE STUDY**

This study examined the relationship between sub -sectoral credit allocation and operating profit of private commercial banks in Ethiopia using unbalanced short panel in order to fill a gap in banking literatures. As a result, the finding of this study is supposed to benefit the management of each bank under investigation and the shareholders on how to allocate credit to economic sub -sectors to maximize their operating profit and in turn their dividend. The study is also expected to contribute implications for policy makers and regulators like national bank of Ethiopia. In the same vein, it can be used as a literature and base for further direction to other academic researchers who are willing to conduct studies.

### **5. LITERATURE REVIEW**

The banking industry has achieved great prominence in the developed world than developing countries. Developing Countries such as the Ethiopian economic environment have promising situations for and a predominant role in granting credit facilities (Getahun, Anwen, & Bari, 2015). As primary function, commercial banks mobilize fund from surplus economic units (savers) in the form of deposit and provide it to the deficit economic units (ultimate borrowers) in the form of credit (Assefa, 2014). Then, they generate interest income which is the difference between interest rate on deposit and credit. In Ethiopia, there has been growth in these activities in the post reform period than pre reform (Deribie, 2012). Before the reform period, the Ethiopian economy was characterized as a command economy whereas after 1992 when the new EPRDF government comes to power a free market economy was declared. As a result several private firms have flourished (Hagos & Asfaw, 2014). Accordingly, number of private commercial banks including Awash International Bank, Dashen Bank, United Bank, Wegagen Bank, Bank of Abyssinia, Cooperative Bank of Oromia, Lion International Bank, Oromia International Bank, Zemen Bank, Bunna International Bank, Nib International Bank, Berhan International Bank, Addis International Bank, Debub Global Bank, Abay Bank, and Enat Bank are established and provide banking service. Given the good performance of the economy, and attractive profits declared in the private banking industry, investors are attracted to invest in this sector with the hope that the future value of their shares will be high (Deribie, 2013). Thus, in terms of the fresh loans annually disbursed, the share of private banks is at par with public commercial banks (Gashayie & Singh, 2016). The government of Ethiopia continues to implement repressive policies that negatively impact and weaken private commercial banks; making interferes with the credit allocation decisions of private banks (Bezabeh & Desta, 2014). Although, the government often issues strict directives favoring public sector banks and to the contrary impacting private banks, still private banks support Government's development plan (Deribie, 2013). With regard to this, Private banks in Ethiopia provide credit to different economic sub sectors including agriculture sector, domestic trade and services, transport and communication, manufacturing, International trade (import and export), construction and building , Hotel and tourism, and other productive sectors. However, according to Hagos & Asfaw (2014), the share of loan disbursement to real sector (agriculture, industry and housing & construction) shows an increment from time to time. On the other hand, National Bank of Ethiopia set limitations on loans and advances according to licensing and supervision of banking business directives No. SBB/53/2012 to ensure that commercial banks have diversified their credit risks minimizing losses due to default. . According to the banks manual, credit concentration can occur when a bank's credit portfolio enclose a high level credits to: counterparties; specific industry; specific geography; type of credit (i.e. overdrafts); and to specific collateral (Hagos & Asfaw, 2014). As said by Turkmen & Yigit (2012), diversification is one of the important issues of finance literature that is also crucial for a bank as a financial institution. Distribution of credit according to economic sectors is important to maximize income and to minimize risk simultaneously (Kazan & Uludag, 2014; Mokaya & Jagongo, 2014).

### **6. RESEARCH METHODOLOGY**

This study was designed following post-positivist paradigm that reflects a deterministic philosophy in which causes probably determine outcome and knowledge creation is restricted to what can be observed and measured. The dimension of the research design was an arrangement of ex post control over variables; longitudinal time dimension; quantitative approach in depth; and deductive method of inquiry. Target population of this study was all 16 private commercial banks in Ethiopia. From these, banks having seven years annual financial report from 2010 to 2016 were selected purposely. Thus, data were collected from audited annual report of each commercial

bank.

## 7. ECONOMETRIC MODEL SPECIFICATION PROCEDURES AND DISCUSSION

All data that have been gathered from secondary sources were processed using STATA 13. It's obvious that the choice of dependent and independent variables with their measurement is an important issue while specifying an empirical model. In line with this, dependent variable is operating profit. Besides, independent variables are loan and advance distributions to economic sub sectors including credit to: domestic trade and service, Building and construction, Manufacturing, Transportation, Agriculture, Import and Export. Further, Comparison among pooled OLS, random effect and fixed effect models was made to select the best fitted model using Breusch and Pagan Lagrange Multiplier test, Chow test, and the Hausman test. Based on the result of chow (F) test, appropriateness of pooled OLS was rejected, suggesting fixed effect (Prob> F = 0.0003). In the same fashion, Breusch and Pagan Lagrangian multiplier test for random effects also rejected null hypothesis for the appropriateness of pooled OLS and suggest random effect over pooled OLS (Prob> chibar2 = 0.0031). The result of these two tests revealed existence of individual effect (individual heterogeneity) for the reason that Pooled OLS which cannot consider the effect of observed and unobserved heterogeneity that do not vary over time is rejected. In such a case, it's appropriate to choose between random and fixed effect. To this end, Hausman test was applied to check whether the individual heterogeneity in the disturbance term and the individual (group or time) effect is correlated or not correlated with any independent variables. Accordingly, the test made random effect appropriate, assuming that individual effect is not correlated with any regressor due to the statistical insignificant result (Prob>chi2 = 0.7872). As a result, the following baseline model was formulated to examine the nexus between private commercial banks' sub sectoral credit allocation and operating profit.

$$OPROF_{it} = \alpha + \beta_1 DTRS_{it} + \beta_2 BUACON_{it} + \beta_3 MAN_{it} + \beta_4 TRANS_{it} + \beta_5 AGRI_{it} + \beta_6 IMPO_{it} + \beta_7 EXPO_{it} + (\mu_i + \epsilon_{it})$$

Where:

Variable	Symbol	Expected sign
<b>Operating profit of private commercial bank</b>	OPROF	
<b>Banks' Credit to Domestic Trade and Service sub –sector</b>	DTRS	+
<b>Banks' Credit to Building and Construction sub –sector</b>	BUACON	+
<b>Banks' Credit to Manufacturing sub –sector</b>	MAN	+
<b>Banks' Credit to Transportation sub –sector</b>	TRANS	+
<b>Banks' Credit to Agricultural sub –sector</b>	AGRI	+
<b>Banks' Credit to Import sub –sector</b>	IMPO	+
<b>Banks' Credit to Export sub –sector</b>	EXPO	+
$\alpha$ = constant; $\beta_1-7$ = parameters estimated		
$\mu_i$ = Unobserved random effect that varies across banks but not over time		
$\epsilon_{it}$ = An idiosyncratic error term and $i$ = Bank $i$ during year $t$		

Before running the panel regressions, the data were checked for normality, multicollinearity, and model specification tests to fit the classical liner regression model assumptions. A multicollinearity test has been done so as to assure the orthogonality of the variables applying the variance inflation factor. The results of VIF for all explanatory variables appear less than 6. For this reason, multicollinearity was not a problem in this case. Shapiro wilk test for normality revealed insignificant result (Prob>z = 0.2544), indicating variables are normally distributed. Heteroscedasticity and autocorrelation were controlled using clustered robust standard error.

### Random-effects GLS regression

OC	Coef.	Robust Std. Err.	Z	P> z
DTRS	.1439427	.0239566	6.01	0.000
BUACON	.0347283	.101493	0.34	0.732
MAN	.1507344	.043046	3.50	0.000
TRANS	.0675491	.0683031	0.99	0.323
AGRI	-.0914013	.1603497	-0.57	0.569
IMPO	.2118356	.12665	1.67	0.094
EXPO	.1937629	.0840396	2.31	0.021
CONS	12,900,000	17,700,000	0.73	0.468
R-square=0.9456				
Number of observations = 69				
Prob> chi2 = 0.0000				

Source: STATA output

The explanatory power of independent variables is 94.56%. The implication is that distribution of loan and advances to economic sub sectors impacts 94.56 % towards interest income (operating profit) of private commercial banks in Ethiopia. However, the rest is influenced by other factors, not included in this study. Based

on random-effects GLS regression result, Credit to domestic trade and service sub sector, Manufacturing sector, Import and Export has positive and significant effect towards operating profit of private commercial banks in Ethiopia, indicating positive movement between the variables. Therefore, results of these variables are concurrent with the expected hypotheses. As credit allocation to these sectors increase, operating profit will raise in the same direction. However, bank credit to building and construction, and Transportation are not considered as powerful to explain operating profit due to their insignificant result.

## **8. CONCLUSION**

The paper tried to investigate empirically the relationship between loan and advance distribution to economic sub-sectors and interest income from credit which is counted as operating profit of privately owned commercial banks in Ethiopia using unbalanced panel data. The regression results revealed that credit distribution to domestic trade and service, manufacturing sector, and import and export has statistically positive effect on operating profit. On the other hand, credit to building and construction and transportation has statistically insignificant positive relationship with interest income. However, private banks' credit to agricultural sector has statistically insignificant negative association with operating profit.

## **9. RECOMMENDATIONS/IMPLICATIONS**

According to Creswell (2012), research is important for three reasons. First, research is undertaken to contribute to existing information about issues by providing additional results to confirm or disconfirm results of prior studies and add value to existing knowledge. Second, it is undertaken to suggest improvements for practice. Third, it provides information to policy makers. In line with this, the findings of this study have theoretical, practical and policy contributions and suggestions that can be applied for.

### **9.1. IMPLICATION FOR MANAGEMENT AND SHARE HOLDERS**

The study recommends that Private commercial banks should distribute more credit to sectors with significant positive effect because they will have more result in generating commercial banks' operating profit. However, do not forget to consider the risk that high return on investment may bear. As a result, Trying to diversify the credit distribution to minimize risk of loss make the banks better-off. In addition, the banks under investigation should reconsider in distributing credit to sectors that have negative effect as they will result in decreasing the operating profit. Nevertheless, as it is mentioned in the background of the research, economic sectors are volatile. Therefore, commercial banks should update the latest news of each sector. Because, as economic sectors are volatile, the trend is changing through time, banks should be careful in lending money to each economic sector to minimize risk.

### **9.2. IMPLICATION FOR NATIONAL BANK OF ETHIOPIA AS REGULATOR**

As regulator, National Bank of Ethiopia issued credit limit guideline to individual counterparties and groups of connected counterparties of banks. This is good direction for the reason that excessive lending may induce a process of overheating the economy, favoring a generalized increase in prices, hyper inflation (Moinescu, 2012). However, commercial banks under this study may ignore credit to agricultural sector due to its negative effect on operating profit. Further, this decision may reduce the contribution of agricultural sector to the national growth. Because insufficient lending to the economy may pose a problem of slow growth (Arsene & Guy-Paulin, 2013). Therefore, the policy insight of this study is concurrent with Kistana, Aregawi, & Abraha (2014), suggesting the National Bank of Ethiopia to put a minimum percent of credit allocation to agriculture, for easy access to finance, in its directives as long as the main development agenda of the Ethiopian government is poverty eradication and Agricultural sector is the central pillar to do so.

### **9.3. IMPLICATION FOR THEORY AND LITERATURE**

Along with the theoretical contribution, the present study contributes to the ongoing debate in banking literature through its examination on the nexus of commercial banks' credit allocation and operating profit. More importantly, to the best of the researcher's knowledge, this study is original study that examined the nexus between private commercial banks' sub- sectoral credit allocation and operating profit in the case of Ethiopia where there is deficiency of the same study. Hence, it may give insight for academicians as literature for further studies.

## **10. LIMITATIONS OF THE STUDY AND DIRECTION FOR FUTURE RESEARCH**

This study was carried out based on short panel of private commercial banks only. Hence, future research can be conducted using long panel even by including public banks to increase the number of observation. Besides, the finding of this study revealed that Banks' credit affects profitability. On the other hand, profitability is a key to economic growth (Adekola, 2016). Moreover, economic growth has significant impact on banks' credit (Assefa,

2014). Hence, there is a margin for future research, suggesting to investigate the link between banks' credit to economic sectors, profitability and sub sectoral economic growth to determine whether the three variables granger causes each other, and their reciprocal joint effects.

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