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GEOGRAPHIC DIVERSIFICATION AND BANK PERFORMANCE: EVIDENCE FROM ETHIOPIA

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ABSTRACT
This paper examines the effect of geographic diversification on financial performance of selected banks from Ethiopia. The data consists of twelve private and government commercial banks for a period of 6 years from 2008/09-2013/14. The fixed effects model was used to estimate the regression and geographic diversification was found to have a positive and significant effect on both return on average asset and average equity. However, this positive effect of increased geographic diversification on performance tends to dissipate as banks get bigger in size as well.

KEYWORDS
Ethiopia, geographic diversification, bank performance, financial intermediaries.

I. INTRODUCTION

Modern portfolio theory predicts that if the streams of cash flows from different activities are not perfectly positively correlated, a firm that is as diversified as possible will be able to stabilize its reported performance, or conversely, will be able to maximize profits given the level of risk. For financial institutions, these forms of diversification may be geographic, income, broad asset sector, or industrial. The heavily accumulated evidence over the years on this particular area points to either direction as to how diversification affects firms' performance/risk, however. Some have found evidence that diversification indeed benefits firms as it brought about stability in returns and/or resulted in maximum returns for given amount of risk. Others have documented evidence substantiating the opposite, diversification worsens a firm's risk return profile. Still others found evidence that diversification did not affect a firm's risk return profile whatsoever.

The differences and, at times, the contradictions among studies that explored the issue of diversification and performance/risk can be numerous. Differences in models/perspectives by scholars, complexity of the nature of the relationship between performance and diversification could be the source of the difference. According to Pandya & Rao, 1998, Intervening variables (mode of diversification, institutional context, managerial capability, ownership structure) that affect the way diversification and the return/risk indicators (return on assets, return on equity, efficiency measures, stability/variability of returns, market valuations) could intensify this relationship.

To our knowledge, no study has been conducted to investigate the effect on financial performance, if any, of geographic diversification by commercial banks in Ethiopia. This paper tries to investigate the impact of geographic diversification on profitability of Ethiopian commercial banks.

II. BRIEF REVIEW OF THE LITERATURE

Does Diversification enhance or destroy firms' financial performance? This question has been explored extensively since Markowitz, (1952) came up with the theory that predicted returns will have minimal variability if investments in securities is shared among various assets. The greater the number of assets in a portfolio, the more stable are the stream of cash flows for given return and the maximum the returns will be given the amount of risk. In an attempt to test if this theory holds if applied to firms, many researchers have posed this question and came up with some times confirming and sometimes refuting answers.

The studies that have found evidence for a positive effect of bank diversification on returns and/or risks include: Boyd, Graham, & Hewitt, (1993), Templeton & Severiens, (1992), Pandya & Rao, (1998), Lown, Osler, Sufi, & Strahan, (2000). Others advise against the diversification strategy for they found evidence of decreased returns, increased exposure or risk of failure and loss or dissipation of shareholders' wealth and even diseconomies of scale associated with increased diversification Lang & Stulz, (1994), Berger & Ofec, (1995), Comment & Jarrel, (1995), Stiroh (2002), Hayden, Porath, & Westernhagen, (2007), Laeven & Levine, (2007), Delong, (2001).

If returns from different areas are not perfectly positively correlated, banks benefit from diversifying geographically as this diminishes risk of failure Diamond, (1984) and Pyle, (1971). Economies of scale and resulting elevated earnings is another benefit that accrues to diversifiers into new areas (Chandler, (1977); Gertner, Scharfstein, & Stein, (1994); and Berger, Demsetz, & P., (1999)). The aforementioned scholars' theories however were challenged by corporate governance theorists that brought to light the agency problem that surfaces if affiliates are to be located in a geographically dispersed areas (Jensen, (1986), Jensen & Meckling, (1976), Jensen & Murphy, (1990) and Scharfstein & Stein, (2000).

Though to a lesser extent than it deserved as noted by Morgan and Samolyc (2003), geographic diversification by banks has been explored using data from different countries with varied institutional settings over the years.

Jayratne & Strahan, (1996) examined the effect of the Riegle-Neal Interstate Banking and Branching Efficiency Act that allowed US banks to operate outside their home state. They found that performance of the banks improved after entry restrictions were lifted and the loan qualities progressed. Berger & DeYoung, (2001) studied the effect of geographic expansion on cost and profit efficiency for over 7,000 U.S. banks, for the period 1993-1998. They found that parent banks expanding into neighboring states are able to achieve better efficiency but this tends to dissipate as affiliates move away from their parent companies.

Emmons, Alton, & Yeager, (2001) simulate mergers of community banks both within and across economic market areas. They found that the potential for reduction in idiosyncratic risk dominates the possible marginal reduction in risk by diversifying across markets. Deng & Elyasiani, (2005) studied 388 bank holding companies for the period 1994-2003. Unlike previous studies, their data accounts for both the number of locations in which a bank holding company operates, and the level of activity in each location. Their results show that total risk, idiosyncratic and systematic risk decline significantly with geographic expansion.

Acharia, Hassan, & Saunders, (2002) studied 105 Italian banks over the period 1993–1999 for the various forms of diversification effect on bank risk and return. Their study revealed that geographical diversification results in an improvement in the risk–return tradeoff for banks with low levels of risk. Schmid & Walter, (2008) investigated if geographic diversification is value-enhancing or value destroying in the financial services sector for a rather long period from 1985-2004 and found that geographic diversification is value-destroying when there are more geographic segments and the activities are distributed relatively evenly over these segments except for the investment banking sector. More recently, Jochem, (2013) studied American banks' performance during the 2008-11 US financial crisis. His findings showed that banks geographically diversified can reduce risk of failure by a sizeable amount.

III. METHODOLOGY

Data source and sample selection: Included in the sample are all private and state owned banks that have been in operation and have issued annual reports for at least five years, excluding the Development Bank of Ethiopia, that has been set up specifically to help execute development policies formulated by the government. A total of twelve banks were part of the study for covering the period 2008/09 to 2013/14. The data type is entirely a secondary. The data was gathered from the banks' annual reports, reports from the National Bank of Ethiopia, and annual reports from the Ministry of Finance and Economic Development.

Variables: To test the relationship between the banks' geographic diversification and their financial performance, three sets of variables (the independent variable, the dependent variables and control variables) are measured and their relationship analyzed using the STATA 12 statistical package. Return on average assets (ROAA), and return on average equity (ROAE) are calculated as the ratio of after tax income to total assets and to total equity respectively. These measures show the percentage of profit that a company earns in relation to its overall resources.

Geographic Diversification: This measures the degree with which the banks have diversified into the nine regional states and the two chartered cities in the country. To gauge the extent of geographic diversification, use was made of the Herfindahl Hirschman Index (HHI_Geo) as was put forward by Morgan & Samolyk, (2003), Alessandrini, Croci, & Zazzaro, (2005), Cotugno & Stefanelli, (2012) and, Brighi & Venturelli, (2013). The measure is given by:

$$HHI\_Geo_{it} = 1 - \sum_{j=1}^{k}\left(\frac{Bank\ branches\ in\ state_{ijt}}{Total\ bank\ branches\ _{it}}\right)$$

Where the subscripts *i, j* and *t* represent the banks, the regional states and, year respectively (j= 1, 2, 3,… k, where k is equal to the 11 regions in the country). The values of this measure range from 0 to 1, where the value 1 highlights maximum geographical diversification, (with branches equally distributed among the regions throughout the country) while the values close to zero represent no geographic diversification at all. The different company specific and macro level control variables that have a bearing on the profitability of the banks are discussed below.

Bank Size: Despite fear that banks should not be allowed to grow so large in Size as to become too big to fail, various researches show that big banks are more profitable and have better capital adequacy than small banks (Short, 1979). Shehzad, Haan, & Scholtens, (2013)) found this to be true in their paper that studied bank profitability in Organization for Economic Co-operation and Development (OECD) countries. This was in contrast to the empirical works by Athanasoglou, Brissimis, & Delis, (2008) and Goddard, Molyneux, & Wilson, (2004) who studied European banks and found a weak relationship between size and profitability. In this paper, bank size is the main control variable that enables us to distinguish the effect of diversification from scale effects. It is measured by taking the natural logarithm of average assets of the banks and a positive effect of size on profitability is anticipated.

Capital: Whether well capitalized banks outperform the highly leveraged ones is an issue extensively explored in the capital structure literature. The widely held theory is that higher capital-asset ratio (CAR) is associated with a lower after-tax return on equity (ROE).

In the world of Modigliani and Miller with perfect capital markets and no bankruptcy costs, the capital structure (whether the assets were financed with debt or equity) should not matter, and value can only be generated by the assets. However, with asymmetric information and bankruptcy costs, the way with which assets are financed could create value (Modigliani & Miler, (1958), Modigliani & Miller, (1963)). Berger (1995) found evidence that CAR and ROE are positively related. This was attributed to the fact that highly capitalized banks tend to face lower cost of funding due to lower prospective bankruptcy costs.

Banks that operate in a highly regulated environment which requires them to hold a higher amount of capital regard this binding restriction as a cost. To the extent that banks try to pass some of the regulatory cost on to their customers, a positive relationship may be anticipated between capital and profit [Flamini, (2009)]. In Ethiopia the banking sector is strictly regulated and banks could not transfer this regulatory cost to their customers as the most important source of income (i.e., the lending rate) is set by the central bank. Hence a negative relation between capital and profitability (or conversely, a positive association between leverage and profit) is expected.

Credit Risk: The ratio of loan loss provisions to total assets is used to proxy for the level of credit risk the banks are taking on. Poor loan screening and monitoring practices result in a higher value of this ratio. This variable is expected to have a negative effect on the banks' earnings.

Expenses Management: Operating expenses can be used to measure how efficiently management has been using the assets at its disposal. Improved management of these expenses will increase efficiency which translates to better profits. It is measured as the ratio of operating expenses to total assets and is expected to be negatively related to profitability.

Inflation: How Inflation affects bank profitability depends on whether the inflation is anticipated or unanticipated (Perry, (1992)). If an economy of a nation is mature enough to make reasonable forecast of inflation possible, then banks may be able to adjust their interest rates beforehand to counter the increase in operating costs. Hence, inflation and profitability may be associated positively. The variable inflation is expected to have a negative sign in the regression outputs.

GDP: Total economic activity in a country is primarily measured by gross domestic product (GDP). Growing GDP (favorable economic condition) is expected to influence various factors that in turn affect the supply of (demand for) deposits and funds. This variable is expected to have a positive effect on the profitability of the banks.

Model Specification: We estimate a regression of the form:

$$y_{it} = \alpha + \beta_1 Size_{it} + \beta_2 HHI\_Geo_{it} + \beta_3\, Capratio_{it} + \beta_4 Genexpratio_{it} + \beta_5 Llratio_{it} + \beta_6 Inflation_{it} + \beta_7\, Gdp + \varepsilon_{it} \qquad (1)$$

Where y_{it} is a measure of a bank's financial performance (either return on average asset or average equity). The subscripts *t* and *i* denote time (year) and individual banks respectively. The parameters β_1 through to β_7 are the coefficients of the explanatory variables, (discussed above) to be estimated. $\varepsilon_{it} = \mu_i + v_{it}$, where μ_i is the unobserved heterogeneity that is time invariant and, v_{it} the idiosyncratic error that varies over time and entities. The hausman test shows that the fixed effects model is appropriate to estimate the model.

To examine if the effect of geographic diversification varies across different sizes of the banks, we estimate a model that includes an interaction term between size and diversification index following (Morgan & Samolyk, 2003). The model with the interaction term is given by:

$$y_{it} = \alpha + \beta_1 Size_{it} + \beta_2 HHI\_Geo_{it} + \beta_3\, Capital_{it} + \beta_4 Size * HHI\_Geo_{it} + \beta_5 Genexpratio_{it} + \beta_6 llratio_{it} + \beta_7 Inflation_{it} + \beta_8\, Gdp + \varepsilon_{it} \qquad (2)$$

The notations in this equation are the same as the ones in equation one above (except the inclusion of an additional control variable) and this model has also been estimated using the fixed effects method.

IV. RESULTS AND DISCUSSION

Tables 1 and 2 provide summary statistics for the variables and correlation matrix among the explanatory variables used in the analysis. After outliers have been eliminated, the number of observation for all the variables is 61 except for loan loss ratio.[1] The return on average asset and has a mean value of 3.16% and a standard deviation of 0.68%. Return on average equity has a mean and standard deviation of 25% and 6.9% respectively. The mean herfindhal index is 0.63 roughly indicating a strategy by the banks favoring geographic diversification. The variance covariance matrix does not show strong correlation among any two of the independent variables which indicates that there is no problem of multicollinearity in the model. The variance Inflation factor (VIF) has also been run and there is no indication of multicollinearity among the variables.[2]

[1] This is because loan loss provision data for construction and business bank of Ethiopia and a few other banks could not be obtained.

[2] The results of this test would be availed upon request from the authors.

TABLE 1: DESCRIPTIVE STATISTICS

Variable	Obs	Mean	Std. Dev.	Min	Max
ROAA	61	3.1621	0.6793	1.2400	4.9500
ROAE	61	25.1843	6.8922	12.0423	40.4437
Size	61	22.5287	0.8660	20.3982	24.9200
HHI_Geo	61	0.6344	0.1267	0.2455	0.9075
Capratio	61	13.1774	3.5373	7.9100	22.0974
Genexpratio	61	1.4573	0.4829	0.3515	2.8219
Llratio	52	0.3576	0.5349	-0.1031	3.4946
Inflation	61	18.1574	12.4517	2.8000	36.4000
GDP	61	2.3047	0.0824	2.1633	2.4336

TABLE 2: CORRELATION MATRIX BETWEEN EXPLANATORY VARIABLES

	Size	HHI_Geo	Capratio	Llratio	Genexpratio	inflat~n	GDP
Size	1						
HHI_Geo	0.1347	1					
Capratio	-0.3866	0.2178	1				
Llratio	-0.067	0.0859	-0.0807	1			
Genexpratio	-0.7493	-0.1339	0.1658	0.0416	1		
Inflation	0.0179	0.0788	-0.1634	-0.1316	-0.1661	1	
GDP	-0.0433	-0.0191	-0.0043	0.0199	-0.003	-0.5658	1

Table 3 presents regression result based on the first equation without the interaction term between geographic diversification and asset size. Size (natural logarithm of total assets) has a positive and statistically significant impact on both measures of returns as expected. Capital ratio (Capratio) is found to significantly affect performance negatively (ROAE) during the sample period as hypothesized. The negative relationship reflects a standard risk-return payoff: firms with higher capital ratio are less risky and therefore generate lower earnings. The banks' management may be extremely risk averse that operates cautiously and ignores profitable investment opportunities.

GDP growth and inflation are found to be negatively related to bank profitability but the coefficients are not statistically significant. The negative sign for GDP purports to lend support to the view that improved economy and the resulting developed business environment lowers bank entry barriers. This intensifies competition harming the banks' profitability as was suggested by Tan & Floros, (2012). Unreported regression of per capita income on banks' earnings also had the same effect as GDP on performance measures. The negative effect of inflation on the banks' performance was expected. This may be an evidence of the banks' failure to anticipate inflation and consequently adjust the prices of their services before the effect of inflation sets in to heighten their costs of operation.

TABLE 3: REGRESSION RESULTS WITHOUT INTERACTION TERMS BETWEEN GEOGRAPHIC DIVERSIFICATION AND BANK SIZE

	Dependent Variables	
	ROAE	ROAA
Size	4.100*	0.578**
	0.0121	0.0051
Capratio	-1.449*	-0.0180
	0.0225	0.8126
HHI_Geo	38.67**	4.618*
	0.0093	0.0124
Genexpratio	-9.035*	-1.170*
	0.0321	0.0266
Llratio	-3.691*	-0.4080
	0.0420	0.0699
Inflation	-0.0378	-0.0035
	0.5495	0.6573
GDP	-2.2430	-0.2660
	0.7936	0.8038
_cons	-51.2200	-9.8700
	0.2962	0.1106
N	*52*	*52*
R-sq	*0.4672*	*0.3944*
F (7,33) =4.13 p-value = [.0023]		
Hausman test H0: RE vs. FE: CHISQ(7) = 15.20, p-value = [.0355]		

p-values in parentheses. * p<0.05, ** p<0.01, *** p<0.001

The hypothesized negative relationship between the variables Llratio (Loan loss ratio) and Genexpratio (general expenses ratio) have also been confirmed by the regression results. These coefficients are highly statistically significant. The variable of our major interest, geographic diversification positively affects both returns on asset and returns on equity and significantly so at 95% level for ROAE and at 90% for ROAA.

TABLE 4: FIXED EFFECTS REGRESSION RESULTS WITH INTERACTION TERM BETWEEN BANK SIZE AND GEOGRAPHIC DIVERSIFICATION

	Dependent Variables	
	ROAE	ROAA
Size	20.18***	2.251***
	0.0000	0.0004
Capratio	-1.839**	-0.0587
	0.0011	0.3977
HHI_Geo	609.1***	63.98**
	0.0002	0.0022
Size_HHI_Geo	-26.81***	-2.790**
	0.0004	0.004
Genexpratio	-6.939*	-0.952*
	0.049	0.0441
Llratio	-2.989*	-0.335
	0.0486	0.0961
Inflation	-0.0369	-0.0034
	0.4813	0.6274
GDP	-3.206	-0.366
	0.6527	0.7011
_cons	-387.9***	-44.90**
	0.0002	0.0011
N	52	52
R-sq	0.6444	0.5346
F (8, 32 =7.25, p-value = [.0000]		
Hausman test H0: RE vs. FE: CHISQ(8) = 239.14, p-value = [.0000]		

p-values in parentheses. * p<0.05, ** p<0.01, *** p<0.001

Table 4 above presents regression coefficients along with their p-values for model (2) that includes interaction term variable between size and geographic diversification. The model has a better explanatory power than the previous one as its R-squared (0.6444 for ROAE and 0.5346 for ROAA) and F-statistic (0.0000) are higher for this model. The interaction term has a statistically significant negative effect with p-values 0.0004 and 0.004 for ROAE and ROAA respectively. If firms' geographic diversification is accompanied by commensurate increase in asset size, then the banks' profitability declines. This implies that large sized banks do not reap as much benefit from geographically diversifying as the smaller banks do. The benefits from diversifying tend to get smaller with bank sizes. The coefficients for the other control variables are positive in this model and have a larger statistical significance.

V. CONCLUSION

The study set out to investigate the effect of geographic diversification strategies on the financial performance of Ethiopian commercial banks during the period 2008/09 2013/14. To our knowledge, this paper is the first of its kind to examine this phenomenon in Ethiopia. The profitability of Ethiopian commercial banks is found to be highly affected by their size, capital ratio, loan loss ratio and general expenses ratio. The negative coefficient of capital ratio implies that the banks should only aspire to have the bare minimum capital requirements by the National Bank of Ethiopia and leverage their operations to boost their profitability.

The macro variables GDP and inflation have been found to have no statistically significant effect on the earnings of the banks. The banks should focus on their core internal competences to improve their performance. The geographic diversification index has a highly significant positive effect on the returns on asset and equity. An interesting outcome of the regression results is that interaction between size and the diversification measure impacts performance negatively. Diseconomies from diversification sets in once the size effect is controlled for by an interaction term. The implication is that for the banks to reap the benefits of geographic diversification, the banks should be cautious on the scale inefficiencies that result from the accompanying increase in their asset size. The National Bank of Ethiopia should devise policies and incentives that encourage geographic diversification by the banks even more.

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