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Full Length Research Paper

Determinant of financial performance of commercial banks in Ethiopia: Special emphasis on private commercial banks

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This study aims at examining the determinants of the financial performance of private commercial banks in Ethiopia. The study uses secondary data for eight private banks which are in the industry for more than ten years. These banks are chosen from sixteen private commercial banks which are currently functional in Ethiopia banking industry. The data for this study is obtained from annual reports of the banks, minutes and the national bank report. Correlation and multiple linear regressions of panel data for the eight banks for the years 2007 to 2016 is analyzed using random effect model. E-Views 9 software was used for analyzing the data. Return on Asset and Return on Equity are the selected dependent variables while non-performing loan, capital adequacy ratio, bank size, leverage ratio, credit interest income ratio, loan loss provision ratio and operation cost efficiency were the independent variables. Results show that Capital Adequacy Ratio (CAR), Credit Interest Income (CIR) and Size of the bank (SIZE) have positive and statistically significant effect on financial performance. Non-performing Loans (NPLs), Loan Loss Provision (LLP), Leverage Ratio (LR) and Operational Cost Efficiency (OCE) have negative and statistically significant effect on banks' financial performance. The study suggests that Ethiopian commercial banks are advised to manage their loan loss, be cost efficient, and fix their leverage ratio at maximum level to enhance their profitability.

Key words: Ethiopia, commercial banks, determinants, financial performance.

INTRODUCTION

Financial institutions play significant role for economic development of nations in general and of developing countries like Ethiopia in particular, where the financial system as a whole is bank dependent due to poor development or even absence of the stock market. Banks are one of the deposit taking financial institutions that play pivotal role for financial stability and are also engines for economic development of a given nation (Al-Karim

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and Alam, 2013). One of the principal objectives of the financial institutions, particularity the banking sector is mobilizing resources from those who have excess supply especially in the form of saving deposits and channeling these funds to those who are with financial constraints, at the same time with productive investment opportunities.

According to Sufian (2009), financial institutions paly key role in economic growth as they are mobilizing savings for productive investments through facilitating role in capital flows towards various sectors of the economy. It is also worth noting that commercial banks in most of the world economies are dominant type of financial institution that provide installment, facilitate the internal and external trade and move money and capital when compared to any other financial institution (Greuning and Bratanovic, 2003).

The overall operation of the economy of developing countries is dependent on well-functioning of their commercial banks. If not, the entire economy will be illiquid, saving and investment will be divorced which could result in further economic stagnation.

According to Zawadi (2013), a healthy financial system of banks is the guarantee not only for depositors but also for all stakeholders who directly or indirectly are affected with banks' operation such as: shareholders, employees, investors, depositors, government and the whole economy at large. As a means to boost the confidence of these stakeholders, efforts have been exerted to assess the determinants of financial performance of financial institutions in general and the banking sector in particular by various researchers.

But, in order for the banks to successfully provide such intermediation function and contribute their best to financial stability and economic growth as well, their financial performance has profound role.

Private banking in Ethiopia is an infant practice as it exists only after two decades that private investors were allowed to invest in the industry. To this end, countless factors could set limit on their performance. Hence, these factors must be clearly identified so as to make the concerned governing body take corrective action.

This particular article therefore, is devoted to identify the determinants of the bank industry in Ethiopia by providing special emphasis on private commercial banks.

Statement of the problem

The economic development of any country depends on the existence of well-organized financial system. The aforementioned is possible because it is the financial system that could provide inputs for the production of goods and provision of service that in turn will affect the standard of living of nations. The financial system is a complex system that consists of financial institutions, financial markets and instruments. Financial institutions are intermediaries that transfer funds from the surplus unit to deficit unit.

Banks as financial institutions particularly provide unique function in an economy by bridging saving and investment activities. In the course of the desire to operate profitably, the banking sector acts as an engine in enhancing modern trade and commerce for business firms and individual traders (Melaku, 2016). But such function is not being provided smoothly without hindrances. Countless factors bottlenecked the operation of the financial system in general and the bank industry of developing countries like Ethiopia in particular. These factors are classified as internal and external factors. The internal factors are termed as micro or bank-specific factors like bank lending, bank size, efficiency of the management, deposit volume, bank liquidity, bank capitalization level and bank growth. The external factors are macroeconomic variables that are not related to bank management but reflect the monetary, economic and legal environment that affect the operation and performance of financial institutions (Gaiotti and Secchi, 2006). Bank performance could also be affected by external factors as social, economic, political and technological environments.

It would be difficult to manage banks and enjoy their benefits to the economy without understanding and managing such determinants of bank financial performance. Numbers of researches were conducted to analyze the determinants of financial performance of banks in different parts of the world. But researchers devoted to analyzing the performance of banks in general and of private ones in particular are scarce. Researches like Addisu (2015), Berhanu (2016), Melaku (2016) and Rani and Lemma (2017), were, devoted to analyzing the determinants of bank performance using only return on asset as their only measure of financial performance. However, the current study uses key variables which were not included in some of the previously mentioned researches such as interest income, leverage ratio and operational cost efficiency. Hence, this study mainly concentrated on determining key variables that could affect the financial performance of private commercial banks in Ethiopia by providing due emphasis to the bank specific variables as it could be difficult to bank managers to control the external factors.

Therefore, this study will fill the aforementioned gap by focusing on only bank specific factors by including new determinant variables such as credit interest income, leverage ratio and operational cost efficiency. This study also uses more recent data (2007 to 2016) and could pinpoint the critical factors that affect the financial performance of private commercial banks in Ethiopia.

Objectives of the study

The main objective this study is to investigate the determinants of financial performance of private

commercial banks in Ethiopia.

More specifically the study is expected to achieve the following objectives.

1) To examine the effect of Non-performing Loans (NPLs) on financial performance of private commercial banks in Ethiopia.
2) To examine the effect of Loan Loss Provision (LLP) on financial performance of private commercial banks in Ethiopia.
3) To examine the effect of Capital Adequacy Ratio (CAR) on financial performance of private commercial banks in Ethiopia.
4) To examine the effect of Leverage Ratio (LR) on financial performance of private commercial banks in Ethiopia.
5) To examine the effect of Credit Interest Income (CIR) on financial performance of private commercial banks in Ethiopia.
6) To examine the effect of Bank size (SIZE) on financial performance of private commercial banks in Ethiopia.
7) To examine the effect of Operational Cost Efficiency (OCE) on financial performance of private commercial banks in Ethiopia.

Significance of the study

This study is useful in a number of ways. It will assist the banks to identify the specific determinants of bank performance and direct their operation accordingly. The study will also assist government to frame national policy by taking such determinants into account. The study will also bridge the literature gap as it will be used by upcoming researchers.

LITERATURE REVIEW

Poudel (2012) studies the impact of credit risk management on financial performance of commercial banks in Nepal for the period of 2001 to 2011. The result revealed that there is significant relationship between return on assets and all independent variables specifically, default rate, cost per loan assets and capital adequacy ratio. Funso et al. (2012) carried out an empirical investigation on the effect of credit risk on performance of five commercial banks in Nigeria of the years 2000 to 2010 and found that non-performing loans and loan loss provision have statistically significant negative impact on return on assets while loans and advances has statistically positive impact on performance. Habtamu (2012) further reached on the determinants of profitability of Ethiopian private commercial banks for the years 2002 to 2011. Return on assets, return on equity and net interest margin was used as measurement of performance. The fixed effect

regression output revealed that Gross Domestic Product has positive effect on the three measurements of profitability. Management efficiency and bank size have positive effect on both return on assets and return on equity but have no significant effect on net interest margin. Capital adequacy has negative relation with both return on assets and net interest margin but has no significant effect of return on equity. Assets quality has negative relation with net interest margin but have no effect on the remaining two proxies of performance. Ogboi and Unuafe (2013) examines the impact of credit risk management and capital adequacy on banks financial performance in Nigeria using a time series and cross sectional data from 2004 to 2009. Loan Loss Provisions (LLP), Loans and Advances (LA), Non-performing Loans (NPL), and Capital Adequacy (CA) were the proxies of the independent variable whereas; Return on Asset (ROA) was the measure of financial performance. The researcher found that the higher the loan and advances, the worst the performance of banks in Nigeria. The result further indicated that sound credit risk management and capital adequacy enhance performance of the banks under the study. Moreover, Tesfaye (2014) investigated the determinants of Ethiopian Commercial Banks Profitability taking into account bank specific and external variables for the 1990 to 2012 periods. Accounting measures mainly Return on Assets (ROA) was used to measure the banks' performance. The result indicated that management efficiency, expressed by non-interest expense to total expense has negative and significant relation with profitability. Result also showed that capital adequacy serves for providing assurance for liquidity position of banks than enhancing profitability and that liquid asset to total deposit have no significant effect on profitability. From the external determinants of profitability identified by the researcher, the inflation has been observed to have significant effect on profitability. Bank size and real GDP have got no significant effect on profitability. Kenenisa and Chawla (2015) who analyzed the effect of bank size and ownership on financial performance also for the years 2000 to 2013 revealed that bank size, measured by logarithm of total assets got significant effect on the three measurements of performance; mainly return on assets, return on equity and net interest margin. But the bank ownership has effect on performance measured by return on assets revealing that private banks outperform in generating profit on their assets especially those state-owned ones. Million et al. (2015) investigated the impact of credit risk management on profitability of commercial banks in Ethiopia using return on assets and return on equity and found that non-performing loan ratio, has negative and significant impact on return on assets and return on equity. Loan loss provision ratio has statistically significant positive impact of both proxies of performance. Capital adequacy ratio has negative impact on return on equity but found to have
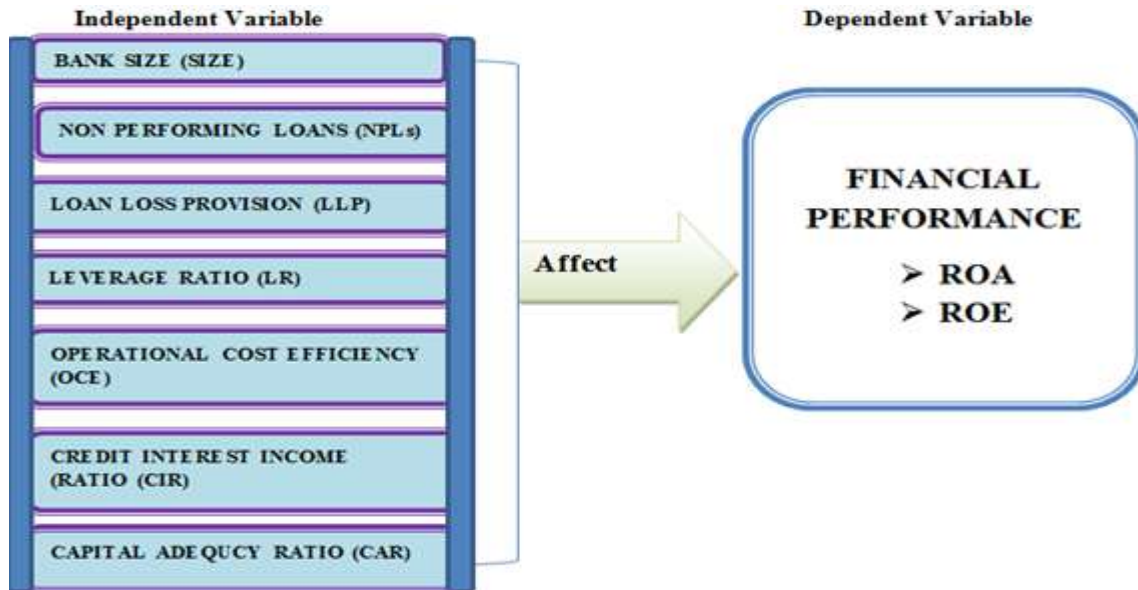
Figure 1. Theoretical model.

no impact on return on assets. Tilahun and Chawla (2016) also assessed the determinants of commercial banks' profitability in Ethiopia for the years 20001 to 2013. The researchers used Net Interest Margin (NIM) as proxy of profitability whereas; number of branches, loan amount, ownership structure, and deposit amount and bank size were used as independent variables for their study. The Ordinary Least Square (OLS) regression indicated that loan to deposit ratio, branch size, and ownership have significant effect on NIM; while bank size has no significant effect. Melaku (2016) also investigated the determinants of profitability of private commercial banks in Ethiopia using data of 2004 to 2011. Return on assets was the measure of performance, whereas capital, assets size, loan to total assets, liquidity, labor productivity, overhead, credit risk, interest income, GDP growth rate, interest rate and market share were the dependent variables. The regression output revealed that provision for loan loss, overhead, have significant negative effect, while earning, net interest income, bank size, and productivity have positive effect on profitability measured by return on assets. Gemechu (2016) also researched on determinants of profitability of bank industry in Ethiopia for the years 2002 to 2012 using return on assets and net interest margin as measure of performance. The finding revealed that loan to advances, efficiency and productivity, have positive effect on both return on assets and net interest margin. Liquidity risk and exchange rate have positive effect on return on assets but have no effect on net interest margin. At the same time, regulation, market concentration, economic growth, interest rate has positive effect on net interest margin but have insignificant effect on return on assets.

But expense mismanagement has negative effect on both measure of performance but capital adequacy has no effect on performance. Lemma and Rani (2017) analyzed the determinants of financial performance of commercial banks in Ethiopia data from two public and seven private banks for the years that were considered for the study. Return on assets was used as proxies of financial performance while the internal and external factors were considered to analyze the factors. Descriptive, correlation and regression analysis were used to analyze the data and the findings revealed that liquidity and earnings ratio have positive relation with return on assets. The findings further revealed that CAR, the ratio of non-performing loan to total loans, and industry growth has negative relation with profitability.

METHODOLOGY

Theoretical model

The following theoretical model was developed from the prevailing literature (Figure 1).

Research design

Explanatory design with quantitative approach was used to accomplish the purpose of the study. All private commercial banks in Ethiopia were used as population of the research from which samples were selected. Purposive sampling was used to deliberately select sample banks based on the selection criteria set by the researchers. Accordingly, out of sixteen private commercial banks, ten banks were purposively selected as a sample based on the availability of data during the years 2007 to 2016. The only state owned bank, commercial bank of Ethiopia was excluded as it is an

Table 1. Descriptive statistics of the dependent and independent variables.

Variables	Observations	Mean	Max	Min	Std. Dev.
ROA	80	0.026360	0.038500	0.002300	0.007430
ROE	80	0.213500	0.356700	0.018400	0.059864
OCE	80	0.548835	2.125000	0.31700	0.485594
NPL	80	0.071805	0.328700	0.013100	0.140955
LLP	80	0.031466	0.254500	0.010600	0.028049
SIZE	80	22.70258	23.89580	19.86520	0.919124
LR	80	7.234944	11.36880	0.133900	2.425154
CIR	80	0.170144	0.385600	0.012800	0.433310
CAR	80	0.083291	0.159100	0.013200	0.038459

Source: Financial statement of sampled banks and own computation through E-views 9.

old aged bank and is also being favored by government policy and comparing it with other private banks could prejudice the findings. Accordingly, Awash International Bank S.C (AIB), Bank of Abyssinia S.C (BoA), Dashen Bank S.C (DB), Nib International Bank S.C (NIB), United Bank S.C (UB) and Wogagen Bank S.C (WB), Lion International Bank (LIB), and Cooperative Bank of Oromia (CBO) were selected as the sample for this particular study. Secondary data mainly collected from the audited financial statements of each banks obtained from website of the National Bank of Ethiopia (NBE) was mainly used to see the effect of the independent on dependent variable. The collected data were analyzed using descriptive statistics, correlations and multiple linear regression analysis of panel data for the years 2007 to 2016. Based on Hausman specification test conducted, random effect regression was conducted using E-views 9 econometric software package, to test the casual relationship between the independent variables and the financial performance.

Study variables

Return on assets expressed as the ratio of net profit after tax to average total assets and return on equity measured by the ratio of net profit after tax to shareholders' equity are the dependent variables of this research. Whereas, non-performing loan which is the ratio of non-performing loans to total loans and advances, loan loss provision, measured by the provision to loan loss to that of total loan outstanding, capital adequacy ratio-measured by paid up capital to total assets, leverage ratio-the proportion of total debt to total equity, credit interest income ratio-the proportion of interest income to credit facilities granted, bank size-which is the logarithm of total assets and operating cost efficiency- the ratio of expenses to revenue are the explanatory variables for the study.

Model specification

The following model was developed based on the variables of the study

$$ROA_{it}=\alpha+\beta_1 NPL_{it}+\beta_2 LLP_{it}+\beta_3 CAR_{it}+\beta_4 CIR_{it}+\beta_5 LR_{it}+\beta_6 SIZE_{it}+ \beta_7 OCE_{it}$$
(1)

$$ROE_{it}= \alpha +\beta_1 NPL_{it}+ \beta_2 LLP_{it} + \beta_3 CAR_{it} + \beta_4 CIR_{it} + \beta_5 LR_{it} +\beta_6 SIZE_{it} + \beta_7 OCE_{it}$$
(2)

Where,
ROA_{it}: is the Return on Asset of ith bank at year t

ROE_{it}: is the Return on Equity of ith bank at year t
NPL_{it}: is the Non-performing Loan ratio of the ith bank at year t
LLP_{it}: is the Loan loss Provision ratio of the ith bank at year t
CAR_{it}: is the Capital Adequacy ratio of the ith bank at year t
CIR_{it}: is the Credit Interest Income ratio of the ith bank at year t
LR_{it}: is the Leverage ratio of the ith bank at year t
$SIZE_{it}$: is the SIZE of the ith bank at year t
OCE_{it}: is the Operational Cost Efficiency of the ith bank at year.

RESULTS AND DISCUSSION

Descriptive statistics

Table 1 provides a summary of the descriptive statistics of the dependent and independent variables for eight private Commercial Banks from the year 2007 to 2016 with a total of 80 observations.

Table 1 show that the mean value of dependent variable that is return on asset was 2.6% with a minimum of 0.2% and a maximum of 3.8%. That means during the period under consideration sampled banks earned an average of 2.6 cents of profit before tax for a single birr invested in their assets. The standard deviation for ROA was 0.007 which indicates that the profitability variation between the selected banks was very small.

The mean value of the second dependent variable, that is, ROE was 21% with the maximum and minimum value of 35 and 1.8%, respectively. This revealed that private commercial banks in Ethiopia were able to generate an average positive return of 21% on their equity for the last 10 years.

As far as independent variables are concerned, the mean value of OCE was 54.8% with maximum value 212% and minimum value 31.7%, which shows that there was a higher variation on the operational cost efficiency over the sample period for this study.

The mean of NPLs was 7.18% with a minimum of 1.3% and a maximum of 32.8%. This indicates that, from the total loans that private commercial banks (PCBs) disbursed, an average of 7.18% were being default or uncollected over the sample period. The standard

Table 2. Correlation matrix of dependent and independent variables.

Correlation	ROA	ROE	OCE	NPL	LLP	SIZE	LR	CIR	CAR
ROA	1								
ROE	0.5820	1							
OCE	-0.3919	-0.5418	1						
NPL	-0.5725	-0.2804	0.1098	1					
LLP	-0.1236	-0.0279	0.0836	0.6822	1				
SIZE	0.2274	0.3400	-0.6113	-0.0290	-0.4068	1			
LR	-0.3435	0.3072	-0.3593	0.2087	-0.3277	0.5032	1		
CIR	-0.0115	-0.1653	0.7477	-0.1422	0.2214	-0.6644	-0.4157	1	
CAR	0.6704	0.0116	0.1828	-0.3285	0.3817	-0.3353	-0.7482	0.3874	1

Source: Financial statement of sampled banks, NBE reports and own computation through E-views 9.

deviation of 14% of NPLs from its mean value shows the existence of variation among PCBs in terms of their loan recovering capacity.

The mean value of capital adequacy was 8.32% with a maximum of 15.9%. The average capital adequacy ratio surpassed the minimum ratio of 8% set by NBE on Directives № SBB/50/2011. This can indicate existence of sound financial condition in Ethiopian commercial banks. The standard deviation statistics for capital strength was 3.84% which shows the existence of variation of equity to asset ratio between the private commercial banks in Ethiopia.

The standard deviation (2.4251), in leverage ratio indicates the existence of high variation among PCBs in terms of their leverage ratio and the same is true for bank size (0.9191).

The credit interest income ratio of banks was between 38 and 1.28% with the standard deviation of 0.433 also indicating relatively high disparity among PCBs interest credit interest income to total asset. Among the independent variables, the smallest standard deviation was reported in loan loss provision ratio which was 0.028. This indicates the existence of less variation among the banks in terms of setting their loan loss provision amount.

Correlation analysis

Correlation is a way to index the degree to which two or more variables are associated with or related to each other Brooks (2008). The most widely used bi-variant correlation statistics is the Pearson product-movement coefficient, commonly called the Pearson correlation which was used in this study. Table 2 shows the correlation between the variables used for this particular research.

Table 2 shows that capital adequacy ratio and size of the banks had positive relation with ROA. The capital adequacy ratio positively affect their performance shows the banks tendency to boost up their paid up capital to gain strength and leading role in the industry.

Results also show that bigger banks or banks with higher total asset amount are more profitable than smaller banks indicating that bigger banks could have high economies of scale. Further the operational cost inefficiency and leverage ratio have negative relation with return on asset, which indicate that the more costly and in debt the banks are, the lower will be their profit.

As far as return on equity is concerned, operational cost inefficiency, non-performing loans and loan loss provision and credit interest income ratio have negative relation with return on equity. Whereas, size and leverage ratio have positive relation with return on equity.

Regression analysis

Return on assets model

Table 3 clearly shows the random analyzed effect of the independent variable indicated in the Return on Assets model.

Table 3 depicts the estimation results of regression model of Return on Asset as dependent variable and bank specific explanatory variables for the sample of eight private commercial banks in Ethiopia. The R-squared and adjusted R-squared 73 and 70% respectively and the F-Statistics of (0.000000) indicates the fitness of the model.

Table 3 shows that loan loss provision has statistically significant negative effect on return on assets of the private commercial banks in Ethiopia. That is, when Loan Loss Provision ratio (LLP) increased by one percent, Return on Asset (ROA) of sampled private commercial banks would decrease by 2%.

Table 3 further shows that NPL has statistically significant negative effect on ROA. This indicates that holding other independent variables constant at their average value, an increase in NPLs by one percent, decreased Return on Asset (ROA) by 0.8033%. This negative association between nonperforming loans and return on asset could be attributed to the fact that, when

Table 3. Random effects model regression results.

Dependent Variable: ROA
Method: Panel EGLS (Cross-section random effects)
Date: 05/12/17 Time: 12:58
Sample: 2007 2016
Periods included: 10
Cross-sections included: 8
Total panel (balanced) observations: 80
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.042479	0.008771	-4.843364	0.0000
OCE	-0.013920	0.001077	-12.92271	0.0000
NPL	-0.008033	0.001895	-4.238441	0.0001
LLP	-0.021113	0.009543	-2.212420	0.0301
SIZE	0.003025	0.000389	7.786757	0.0000
LR	-0.000386	0.000163	-2.363468	0.0208
CIR	0.022585	0.002320	9.734806	0.0000
CAR	0.109012	0.010274	10.61078	0.0000

Effects specification			
		S.D.	Rho
Cross-section random		6.48E-09	0.0000
Idiosyncratic random		0.002022	1.0000

Weighted Statistics			
R-squared	0.732182	Mean dependent var	0.026360
Adjusted R-squared	0.695589	S.D. dependent var	0.007430
S.E. of regression	0.002027	Sum squared resid	0.000296
F-statistic	141.3809	Durbin-Watson stat	1.956514
Prob(F-statistic)	0.000000		

Unweighted Statistics			
R-squared	0.932182	Mean dependent var	0.026360
Sum squared resid	0.000296	Durbin-Watson stat	1.956514

Source: Financial statement of sampled banks, NBE reports and own computation through E-views 9.

the amount of non-performing loan increases the interest income that the banks get from these loans will decrease, which in turn, decrease the return on asset. This would in turn affect the banks' ability to extend more loans to other customers that can generate more income.

Table 3 also reveals that banks size has positive relationship with profitability which is statistically significant at 1% significance level. This implies that every 1% increase in the banks size keeping other variables constant increase profit by 0.3025%. This would be because the bigger the bank, the more economies of scale and hence more profitable it will be.

The result ratio of debt to asset has negative effect on ROA, which is statistically significant at 5% significance

level. This result also shows that debt financing have a negative impact on profitability measured by ROA. The negative association between leverage ratio and return on asset of private commercial Banks in Ethiopia could be attributed to the fact that, when the amount of debt of the banks increases their commitment will rise which indirectly affect their liquidity and as a result their capacity to provide loans to their customers will decrease, which further decreases their ROA.

As indicated in Table 3 the coefficient of capital adequacy measured by the ratio of paid-up capital to total asset is 0.109012 and its p-value is 0.0000. This indicates that holding other independent variables constant at their average value, when capital adequacy

Table 4. Random effect model regression on ROE.

Dependent Variable: ROE
Method: Panel EGLS (Cross-section random effects)
Date: 05/12/17 Time: 13:09
Sample: 2007 2016
Periods included: 10
Cross-sections included: 8
Total panel (balanced) observations: 80
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.056256	0.126405	-0.445045	0.6576
OCE	-0.170704	0.015525	-10.99520	0.0000
NPL	0.006309	0.027315	0.230964	0.0480
LLP	-0.108866	0.137539	-0.791526	0.4312
SIZE	0.011447	0.005599	2.044324	0.0446
LR	0.006475	0.002355	2.749956	0.0075
CIR	0.302737	0.033437	9.053968	0.0000
CAR	0.111644	0.148070	0.753997	0.4533

Effects Specification				
			S.D.	Rho
Cross-section random			2.00E-07	0.0000
Idiosyncratic random			0.029149	1.0000

Weighted Statistics				
R-squared	0.687058	Mean dependent var		0.213500
Adjusted R-squared	0.656633	S.D. dependent var		0.059860
S.E. of regression	0.035076	Sum squared resid		0.088585
F-statistic	22.58209	Durbin-Watson stat		1.790596
Prob(F-statistic)	0.000000			

Unweighted Statistics				
R-squared	0.687058	Mean dependent var		0.213500
Sum squared resid	0.088585	Durbin-Watson stat		1.790596

Source: Financial statement of sampled banks, NBE reports and own computation through E-views 9.

ratio increased by one percent, return on asset (ROA) of sampled private commercial banks would be increased by 11% and statistically significant at 1% level of significance. Therefore, the researcher failed to reject the null hypothesis that capital adequacy ratio has a positive impact on return on asset.

The result shows that there exists statistically significant negative relation between operational cost inefficiency and return on asset of private commercial banks in Ethiopia. The result of this study indicates that the financial performance of private commercial banks in Ethiopia decrease when the amount of their expense increase.

Return on equity model

The operational panel regression model is used to analyze the determinants of financial performance of private commercial banks in Ethiopia measured by return on equity.

Table 4 shows that R-squared and adjusted R-squared are 69 and 66%, respectively. It indicates that the model is a good fit. This means, more than 66% of variations in return on equity of private commercial banks in Ethiopia were explained by independent variables included in the model. The F-statistics (0.0000) also assures that the overall model is highly fit to see the effect of independent

variables on the dependent variables.

As indicated in Table 4, Bank size (SIZE) and Leverage Ratio (LR) And Credit Interest Income Ratio (CIR) have positive and statistically significant impact on the financial performance of private commercial banks in Ethiopia measured by return on equity.

Table 4 also shows that there is a positive and statistically significant impact of Bank Size on return on equity. The result shows a positive coefficient of 0.011447. This indicates that the bank size is significant factor for bank performance even at 5% significance level. This implies that for one unit change in bank size, keeping the other things constant had resulted to 1% unit change on the level of ROE in the same direction. This is due to the fact that bigger banks extend more loans and advances to their customer and earns more income, which in turn boosts their return on equity.

Non-performing loans had positive and significant effect on the return on equity of private commercial banks in Ethiopia with a coefficient sign that was opposite to the case of return on asset.

Conclusion

The research analyzed determinants of the financial performance of private commercial banks in Ethiopia. From the regression output, it can be concluded that size of banks is the determining factor that boosts the financial performance because, it can help them achieve economies of scale. Loan loss provision and non-performing loans are the factors that negatively affect the performance of private commercial banks in Ethiopia. It can also be concluded that the larger the leverage position of the bank, the higher their ability of lend and their performance will be enhanced. It can also be concluded that capitalized banks could extend more loans and advances to their customers and could generate more income than poorly capitalized banks. The finding also enables us to conclude that operational cost inefficiency reduces return on assets and hence banks are expected to work on minimizing their avoidable costs.

RECOMMENDATIONS

1) Private commercial banks in Ethiopia are advised to work towards improving their assets especially the liquid ones and level of capitalization so as to increase their lending ability and to ensure their profitability.
2) Non-performing loans, operational cost efficiency and leverage ratio were factors that negatively and significantly affect the return on asset of private commercial banks in Ethiopia. Thus, private banks in Ethiopia are recommended to revise their credit procedures and policies to reduce the nonperforming loans.

3) Banks should give due attention to their operational cost efficiency and leverage ratio, because excess expenses in relation with their revenue and engaging in debts beyond their capacity will have significant negative effect on their performance.
4) Currently, Ethiopian commercial banks that were sampled in this study were considering collateral as prime factor for assessing loan application in all conditions and hence, providing appropriate focus for factors such as repayment capacity of the client, the feasibility of the project and the experience of the management of the company in credit approval process could improve the quality of their loan portfolios.
5) Banks are also advised to leverage on technology to cut costs and enhance their profitability.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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Full Length Research Paper

Business development and sustainability of selected petrol stations in Anambra state of Nigeria

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The essence of most investments is quality return. Continuous quality returns are guaranteed by patronages enjoyed by the investment, this therefore sustains the business. Hardly has this been achieved by most patrol stations that litter the roads of Anambra state of Nigeria due to the location of such businesses. Pursuant to the aforementioned problem, the study seeks to ascertain the extent to which business development relates to sustainability of petrol stations in Anambra state of Nigeria. The paper is anchored on the 'Central Place Theory'. The population of this study consists of the customers who patronize these petrol stations in Anambra state. The study specifically identified the extent of relationship that exists between location and service sustainability of selected petrol stations. The research question and hypothesis were formulated in line with the specific objective. Infinite population was used because customers that visit the petrol stations cannot be determined, and sample size was determined using Z score for infinite population. Pearson Product Moment Correlation was used to test the hypothesis. The study revealed that there is a significant positive relationship between location and service sustainability of these petrol stations. Based on the finding, the study recommended that relevant regulatory bodies should enforce the compliance of the rules and regulations of Department of Petroleum Resources on location of petrol stations in the state to ensure improvement in the sustainability of these petrol stations.

Key words: Business development, sustainability, central placed theory, Nigeria.

INTRODUCTION

The expectation of every business or investment among other things is for quality returns and sustainability. This

can be achieved by strategic positioning and satisfying the customers need without neglecting other key parameters and its consequences.

To ensure regulation and sustenance, location of any kind of businesses and the service activities in the state are guided by rules, planning principles and standards, and in terms of location, structure or land use development plans. Though relevant authorities oversee, the implementation of these plans based on the advice of professionals like the urban planners, consultants on environmental protection and sustainability, there appears to be indiscriminate and unguided sporadic emergence of petrol/filling stations in obscure locations within and outside cities, highways and roads in Anambra state of Nigeria.

The significant roles petroleum products play in any economy are well known. Chinambu (2011) acknowledges that petroleum is a key driver of industrial activities. Besides industrial development, the transportation sector is presumed to be the major consumer of fuel to facilitate the movement of men, goods and services around the globe.

The increasing instability of consumer preferences and the growing intensity and sophistication of competition force firms to analyze further opportunities. Exploiting existing competencies as well as newer ones depict the possibilities for a firm to attain business sustainability. Today's business environments are complex and increasingly characterized by intense competition. Sellers no longer dictate the pace. Customers' expectations of products, goods and services quality have been on the increase as a result of ease of access to information due to availability of ever increasing modern technologies that facilitate rapid communication globally (Chinambu, 2011), and enable efficiency in production and service to a larger audience.

Organizations are obliged to contend with the rapidly changing environment and at the same time, ensure the satisfaction of their customers' expectations. Organizations are forced to continuously update or revert to improving their business processes if they must cope with uncertainty associated with changes. Business development therefore, aims at changing or innovating the current portfolio in terms of content, technologies or models (Siemer, 1995; Koppers and Klumpp, 2000).

Business development, the authors posit, is not limited to expanding a firm's portfolio, but can also be aimed toward reducing a portfolio. It entails efficiency in tasks and processes to develop and implement growth opportunities within and between organizations. Business development is the creation of long term value for an organization from customers, markets, and relationships.

Apart from being the 6th world oil producing nation with

2.7 million barrels of crude oil and 445000 barrels of refining capacity per day, Nigeria is also one of the biggest consumer of petroleum products in Africa with a consumption capacity of about 48 million liters daily (Oduntan, 2015). Almost every home in Anambra state of Nigeria has a power generator that works all day to provide electricity and just like millions of cars and trucks on the roads, these generators run on premium motor spirit (PMS/Fuel) or automotive gas oil (AGO/Deisel). Offices, factories, schools, hospitals and other businesses depend on private power generated by petroleum powered equipment also. Incidentally, all these oil products are dispensed almost 100% through petrol/filling Stations; it therefore became inevitable to patronize them.

The approval to construct and operate petrol products filling stations is usually obtained from the Department of Petroleum Resources (DPR) (Omeh, 2015). It is no longer news that many petrol stations boycott these bodies in establishing their businesses perhaps to avoid paying the required fees thus, operating in an unapproved and unconducive environment, that is most of the time detrimental to human and other economic activities (Omeh, 2015).

Many of the petrol service stations in Anambra State of Nigeria if not located outside the city, along the express ways in the middle of nowhere, close to residential buildings or public places, in an undulated site or sharp corners where buying decisions cannot be compelling, it is located in city centers where over congestion of traffic will hardly encourage patronage. Those located in the living neighborhood, may even be causing serious hazards to residents in the close proximity of the filling stations but they still enjoy their patronage (Ehikwe and Ngwoke, 2013).

Many of these petrol stations, in addition to insensitivity to customer's basic psychological need, do not care about some important selling points like courtesies, dispensing pump accuracy, quality of product, good attention, orderliness of the station, neatness of the station and its staff, and timely dispatch of customers. Other probable problems include lack of good convenience and functional car service centers with modern equipment. Most petrol stations have closed shops due to wrong location and low patronage. This was supported by John (2015) who maintained that location affects many aspects of business operations. In view of the aforementioned issues, the study seeks to identify the extent to which location relates to sustainability of petrol stations in Anambra State of Nigeria.

The broad objective of the study is to determine the extent to which business development relates to sustainability of petrol stations in Anambra State. The

research question is:

1. "To what extent does location relate to service sustainability of petrol stations in Anambra State of Nigeria?"

Research hypothesis

This hypothesis is formulated to guide the study:

H_a: There is significant positive relationship between location and service sustainability of petrol stations in Anambra State of Nigeria.

LITERATURE REVIEW

Conceptual review

The relevant and basic concepts were reviewed and various authors' views highlighted in an attempt to give meaning to the study. The review is done under the following subheadings.

Business development

Business Development (BD) has been explained in many different forms in literature. From a managerial and competitive perspective, Davis and Sun (2006) point to Business Development as a corporate entrepreneurial capability. Kind and Knyphausen-Aufseß (2007) clarify the role of BD into three levels which are: implicit, established and institutionalized.

In particular, BD is said to be implicit when it lacks any task description or planned effort, established when its relevance and mission are officially recognized within the company and institutionalized. Business development implies the establishment of an ad hoc organizational unit managed by one or more BD specialists. In more established firms, Business Development function is typically organized as a staff function that refers to senior management (Davis and Sun, 2006) who also work closely with the line functions, such as Research and Development (R&D), production and marketing/sales (Sørensen, 2012). In the view of Kind and Knyphausen-Aufseß (2007) through BD, the following three business activities are usually carried out:

(1) The identification of new business opportunities, through a screening of market information and networking activity.

(2) Evaluation of the most profitable opportunities, by analyzing potential partner profiles, market and financial evaluation and strategic fit with the company.
(3) Negotiation of terms and conditions and adaptability of internal resources to enable implementation.

Adding to the aformentioned, Sørensen (2012) maintains that in sufficiently large and specialized organizations, the opportunity identification phase may be carried out by people outside the business development function, such as specialists from research, product development or marketing.

Business development manager's task usually varies based on different phases of the business process. Prior to the decision to pursue a particular growth opportunity, the business developer prepares a business plan based on a sound business model for senior management. Through a synergic business planning activity, BD managers compile, synthesize necessary data, and carry out due diligence as input for the decision-makers. This process usually involves close collaboration with the specialist business functions for the retrieval of intelligence that must be integrated for the business model and business plan (Lorenzi and Sørensen, 2014). They stressed that if the growth opportunity is considered worth pursuing, it is the business developer's task to supervise the implementation of the initiative.

Mshella et al. (2015) posit that business development is the creation of long term value for an organization from customers, markets and relationships. It is all about figuring out how the interactions of business forces combine together to create opportunities for growth. Grand United Theory of Business (2015) defines business development as pursuing opportunities for long term growth from customers, markets, and relationships. Business development is focused on three activities:

(1) Customers: Find new ones and extract value from current ones.
(2) Markets: Figure out where new customers live and find a way to reach them.
(3) Relationships: Build and leverage relationships founded on trust and integrity to facilitate opportunities.

Business development is necessary nowadays for businesses to achieve sustainable business growth (Beltz and Frank-Martin, 2009). It focuses on creating long-term value rather than quick cash solutions. To be a business developer, the manager must align the overall strategy with business development to explore synergies, embrace an innovative and iterative mindset and creatively think about everything about the business. Also monitoring and analyzing are key drivers of growth.

Sustainability

The concept of sustainability has received growing recognition, but it is a new idea for many business executives (Beltz and Frank-Martin, 2009). For most, the concept remains abstract and theoretical. Protecting an organization's capital base is a well-accepted business principle. Yet, many have not considered the need for sustainability of their businesses. The International Institute for Sustainable Development in conjunction with Deloitte and Touche (2000) stated that if sustainability is to achieve its potential, it must be integrated into the planning and measurement systems of business enterprises. They stressed that sustainability means adopting business strategies and activities that meet the needs of the enterprise and its stakeholders. Sustainability.com in conjunction with Rochelle and Aiste (2016) believe that sustainability is simply the ability to sustain. They posit that it is about the future of any business from today's commercial success. They insist that as simple as their disposition is, it captured the expectation and meaning of sustainability vividly and in a nutshell.

Petrol service station

The term 'petrol service or fuel filling station' is an expression commonly used in Nigeria and it is synonymously understood differently in different countries of the world. In an attempt to define it, Taylor et al. (2016) considered different expressions such as filling station, petrol station, gas station or petroleum outlet as any land, building or equipment used for the sale or dispensing of petrol or oil for motor vehicles or incidental thereto and includes the whole of the land, building or equipment. Similarly, Nieminen (2005) defines petrol station as "an area including fuel equipment and piping, storage tanks, forecourt and possible building premises for the sale of fuel (inflammable liquids) to customer's vehicles". Most filling stations sell petrol or diesel; some deal on specialty fuels such as liquefied petroleum as LPG, natural gas, hydrogen, biodiesel, kerosene or butane, while many add shops or eateries to their primary business.

Taylor et al. (2016) noted that some of the factors considered when selecting location for this utility outlet are:

(1) Proximity to population centers
(2) Distance from neighboring petrol filling stations
(3) The easements of using existing utility
(4) The topography
(5) The traffic flow

(6) Competition
(7) Ease of accessibility and exit
(8) Future government plan
(9) The magnitudes of environmental pollution parameters.

Other factors to take into account when making a decision about the location of business include customers, transport, the neighborhood, finances, and other long factors (Ayodele, 2011).

Traffic count

Considering the aforementioned factors, it is important to ascertain the potentials of the location by conducting a simple analysis of that location. There are various methods to follow but the most commonly used by some major marketers like Total Nigeria PLC is traffic count (Afolabi et al., 2011). It involves hourly physical observation, counting and documentation of the number of vehicular movement transiting the side of the road of the proposed location for weeks or months, even seasons, recently it is important to recognize those that fetch in jerry-cans for generators at home or offices and kerosene and Liquid Purified Gas (LPG). During the exercise, vehicles are segmented in motorcycle, cars, lorries, then summarized according to product type consumption such as automotive gas oil (AGO), premium motor spirit (PMS), Biogas or LPG etc… Until recently, it may not make sense to include other users like PMS and AGO generator in the count. But today it will be out of place to ignore these voluminous consumers in their jerry-cans and drums. The outcome of the traffic count is further expressed as a percentage of the company's market share. This gives a glimpse of the potential of the location and possible returns, which should be the motivation to approach the approving authorities, like the Department of Petroleum Resources, town planning authorities etc…

DPR guidelines for approval to construct and operate petroleum products filling station

The procedure and conditions for granting approval for the construction and operation of Petrol Station in compliance with Petroleum Act (Amendment decree no. 37 of 1977 safety rules and regulations) comprises of;

Suitability inspection

The intending marketer is expected to submit an

application to DPR for site suitability inspection. The inspection shall among other issues report on the following basic requirements (Department of Petroleum Resource (DPR), 2007):

(1) Size of the proposed land site.
(2) The site must not lie within pipeline or Power Holding Company of Nigeria (PHCN) high tension cable Right Of Way (ROW).
(3) The distance from the edge of the road to the nearest pump will not be less than 15 meters.
(4) Total number of petrol stations within 2km stretch of the site on both sides of the road will not be more than four including the one under consideration.
(5) The distance between an existing station and the proposed one will not be less than four hundred (400) meters.
(6) The drainage from the site should not go into a stream or river.
(7) In some instances where site is along Federal Highway, a letter of consent from the Federal Highway Authority is required.
(8) A DPR guided/supervised EIA study of the site by DPR accredited consultant is expected.

If suitability report on the aforementioned preliminary issues is favorable, the following documents would be required;

(1) Application letter addressed to the Operations Controller of the DPR Zonal/Field office nearest to where the location of the proposed station site.
(2) Two (2) photocopies of certificate of Incorporation.
(3) Two (2) photocopies of memorandum and article of association.
(4) Two (2) photocopies of current tax clearance.
(5) Original and photocopy of police report.
(6) Original and photocopy of fire report and certificate.
(7) Two (2) original copies of approved building plan.
(8) Two (2) photocopies of letter from land and survey.
(9) Two (2) photocopies of deed of conveyance.
(10) Environmental impact assessment (EIA) report for underground storage tank capacities greater than 270,000 liters (Department of Petroleum Resource (DPR), 2014).

THEORETICAL FRAMEWORK

The study is anchored on the Central Place theory. This is a geographical theory that seeks to explain the number, size and location of human settlements in an urban system. The theory was developed by a German geographer, Walter Christaller in 1933. The theory posits

that settlements simply function as 'central places' in providing services to surrounding areas (Procedure and Conditions for Granting Approvals for the construction and Operation of a Petrol Station, 2010).

Central place theory essentially concerns the provision of convenient point of focus for easy consumer patronage (Gbakeji, 2014). Centrality refers to a state of high accessibility, the quality of being at the center of a business system (Inyang and Ogbonna, 2001). Thus, central place describes the relationship between a point and other points in the surrounding region, and the central place is that point which can be most 'easily' reached from other locations in the region.

In application to the study, it is expected of filling station operators to locate their businesses at a central place where they can attract motorists and enhance sustained patronage. In other words, to be sited in places that would minimize travel costs and inconveniences to the consumers in gaining access to the services they require. Centrality implies that consumers generally use service centers that will enable them satisfy their wants with minimum effort (Gbakeji, 2014).

Even though filling station operators often have location preferences, it should be understood that, the location of filling stations generally despite its importance to the economy, is expected to be guided by a defined standards (Mshelia et al., 2015). According to Bolen (1988) every location on the earth has its analyzable advantages and disadvantages and Mshelia et al. (2015) assert that before the planning permission is granted to construct a petrol filling station, it is a requirement to conduct an Environmental Impact Assessment (EIA). Therefore, only when this is done correctly and rules applied will customers be disposed to compelling patronage of filling stations for improved patronage (Njoku and Alagbe, 2015).

Empirical review

Scholars have made useful effort in the study and understanding of BD and sustainability. It could be said that there appears to be paucity of empirical literature on the area of petrol service stations. However, Lorenzi and Sørensen (2014) carried out a study that explored the organization of business development on the basis of existing empirical literature and three case studies from the biotechnology industry were used. The study adopted the dynamic capabilities perspective to create a theoretical framework for building business development capability that served as a source of competitive advantage. The in-depth case study methodology of interviews and other secondary data were used. The result showed that competitive advantage not only stems

from valuable, rare and difficult-to-imitate resources and capabilities, but from how they are configured and organized by managers. The findings also indicate a strong foundation for firms that are willing to set up business development units to pursue growth opportunities more systematically or for firms that may have rudimentary BD activities, but need to make changes because of poor performance.

Taylor et al. (2016) carried out a research that tried to identify location implications of filling stations in the city of Kitwe, Zambia. The research design was a case study which employed a descriptive cross sectional survey. The sampling frame consisted of all residents above the age of 18 years living within 100 meters from petrol filling stations within Kitwe. The sample size was 385. In view of the 28 filling stations in the city, a sample of 10 was used as reference points to identify the residents to represent the public's perception. The main finding was that filling stations location is influenced by choices made by service station entrepreneurs. It was also found that 77.38% of filling stations in the City of Kitwe were not located according to the established planning standards, guidelines and regulations.

Okeyo et al. (2014) examined the influence of business development services on entrepreneurial orientation and performance. The study analyzed a total of 97 small and medium enterprises in Kenya out of a sample of 150 organizations. Data was collected in Nairobi county through a combination of drop and pick methods. The collected data was analyzed using statistical package for social sciences (SPSS) program "Statistical Product and Service Solutions, an IBM product acquired by IBM in 2009 (Hejase and Hejase, 2013).

Descriptive, correlation and multiple linear regressions techniques were used. The results showed that there is a positive relationship between business development services and performance. They also demonstrated that business development services affect entrepreneurial orientation of the studied firms. However, the results indicate that entrepreneurial orientation does not mediate the relationship between business development services and performance.

Arokoyu et al. (2015) examined the proliferation of petrol filling stations in relation to the minimum environmental safety requirements by the Department of Petroleum Resources (DPR) in Obio-Akpor Local Government Area of Rivers State, Nigeria. The Global Positioning System (GPS) was used to acquire the coordinates of each filling station in the study area, and then imported to the Geographic Information System ArcGIS 9.3 software environment. Distances between filling stations from the road to each other were determined using the ArcGIS 9.3 measurement tool alongside buffering analysis in respect to their

coordinates. Z ratio analytical technique was used to examine the conformity of petrol filling stations to the required distance of 400m and 15m from each other to the road respectively as stipulated by DPR amendment decree 37 of 1997. Findings from the z ratio analysis at 152 degree of freedom and 95% confidence level reveal that the petrol filling stations in the study area neither conform to the required distance of 400m nor to the required distance of 15 m from the road.

Literature has shown that scholarly efforts have been made towards giving meaning to business development and sustainability. Interestingly, Lorenzi and Sørensen (2014) and Okeyo et al. (2014) tried to explore the organization of business development outside the oil and gas industry, while Taylor et al. (2016) looked at the location implications of filling stations in Zambia.

Again, Arokoyu et al. (2015) examined the proliferation of petrol filling stations, with no consideration on business development circuit, but focused on the minimum environmental safety requirements by the Department of Petroleum Resources (DPR). Not only that the studies were conducted outside Anambra State, but none was able to study the two key variables (business development and sustainability) in relation with petrol service stations. This presents a gap in knowledge as one cannot empirically lay claim on business development and sustainability in petrol service stations in Anambra State. Filling of this apparent gap in knowledge becomes the point of departure for this study.

METHODOLOGY

The study employed survey research design. This was adopted to ensure that the information collected is relevant and useful to conduct the study. The information was collected from the variables of the study to show the extent of relationship that exists between these variables.

Structured questionnaire was used for collection of relevant data for this study. The questionnaire consists of section A and B. Section A sought information on personal data of the respondents while section B consists of information relating to statement of the problem, objective of the study and research questions. The questionnaire was structured on a five-point Likert scales ranging from strongly agree to undecided to strongly disagree. The questionnaire is attached in Appendix A**.** The population of this study was the customers who patronize these petrol stations in Anambra state. The population was infinite because the number of customers that visit the petrol stations cannot be determined.

Simple random sampling was performed using a table of computer generated random numbers to select 500 (five hundred) petrol stations out of 963 (nine hundred and sixty three) petrol stations currently operating in Anambra state. This technique gave the petrol stations in the sample frame the equal opportunity of being selected. About 157 are abandoned for inability to breakeven.

The sample size was determined using $n = p(1-p) \left[\frac{Z}{e} \right]^2$

Table 1. Reliability test result.

Variable	Scores
Value	0.980
Part I	-
Number of items	5[a]
Cronbach Alpha value	0.948
Part 2	-
No of Items	5[b]
Total number of items	10
Correlation between forms	0.981
Spearman-brown equal length	-
Coefficient unequal; Length	0.981
Guttman split-half coefficient	0.979

Source: Field survey (2017).

Where n = Sample size
P = Population Parameter (0.5)
Z = Level of confidence (1.96) (corresponding to 95% confidence)
e = Researcher desired level of accuracy 5%)

Substituted;

$$n = 0.5(1-0.5) \left[\frac{1.96}{0.05} \right]^2$$
$$n = 384 \ (282)$$

In measuring the underlying theoretical construct, content validity approach was adopted for this study. Applying this approach, a panel of unbiased experts was carefully selected in the field of statistics and managers of the selected petrol stations. Then, after critical evaluation of the instrument, the panel certified it fit to elicit the actual responses and measure what it is supposed to measure. To test reliability, Spearman-Brown Split Half reliability technique was used in this study, and it was ran using Statistical Product and Service SPSS Version 20. 46 copies of questionnaire representing 12% of the sample were used in the reliability test. The result was 0.981, any reliability coefficient above 0.7 is regarded as reliable and therefore the instrument was confirmed reliable. Table 1 shows the result. Spearman Brown prophecy formula was used to determine the correlation between the two halves;

$$r_{SB} = \frac{2rhh}{1+r_{hh}}$$

$$r_{SB} = \frac{2 \times 0.963}{1+0.963}$$

$$r_{SB} = 0.9812$$

Data analysis

Pearson's Product Moment Correlation which measures the strength of linear relationship was used to test the hypothesis formulated. Statistical Product and Service Solutions, Version 20

(SPSS Ver. 20) was used to aid in running the analysis.

Analysis of research questions

A total of 384 (Three hundred and eighty four) copies of the questionnaire were distributed to the respondents, and two hundred and thirty six copies were retuned (response rate 61.46%) (Table 2).

Hypothesis testing

There is a significant positive relationship between location and service sustainability of petrol stations in Anambra State (Table 3).

Interpretation

The correlation value of 0.929 is an indication of strong positive relationship between the variables which is also statistically significant with p-value of 0.000 (< standard error of 0.05).

DISCUSSION

Results showed that there is a significant positive relationship between location and service sustainability of petrol stations in Anambra State. The implication is that where petrol stations are located will determine the performance of the petrol stations. This is in line with the views of Chan et al. (2004), Martin (2009), Mohammed et al. (2014), Iman et al. (2009) and Okonkwo et al. (2014) that location of petrol stations has a significant positive relationship with performance of these petrol stations. Results from Table 3 also show that there is a statistically significant positive relationship between location of petrol stations and service sustainability Going by the decision-rule, the research hypothesis is accepted which states that there is a significant positive relationship between location and service sustainability of selected petrol stations in Anambra State.

Conclusion

Though relevant authorities oversee the implementation of location plans based on the advice of professionals. There appears to be indiscriminate and unguided sporadic emergence of petrol stations in obscure locations within and outside cities high ways and roads in Anambra State of Nigeria. The study concludes that if petrol stations in Anambra State adhere to the rules and regulations of the approving body regarding location or site of stations, their service delivery and sustainability will be enhanced.

Table 2. Respondents views on how location relates to petrol stations service sustainability.

Questionnaires items	SA	A	SD	D	UN	X	μ
To what extent does location relates to service sustainability of petrol stations in Anambra State	-	-	-	-	-	-	-
Business development (location)							
The petrol stations I buy fuel from are located close to residential buildings	20	31	99	82	-	2.90	236
Many petrol stations are located close to the petrol station I normally buy my fuel and kerosene from	14	45	27	150	-	2.67	236
Petrol stations should be sited meters away from residential buildings	19	31	81	105	-	2.85	236
Land should be allocated specially for petrol stations	-	29	52	147	10	2.44	236
Petrol stations located close to residential area can be dangerous to the health of the residents	13	14	95	112	2	2.68	236
Sustainability (service sustainability)							
The services rendered by the petrol stations I buy fuel and kerosene make me to always patronize them	106	87	10	31	2	4.12	236
I am satisfied with the quality of products I buy from the petrol station	46	44	69	68	9	3.21	236
The petrol station I buy fuel and kerosene from always respond to complaints positively	51	61	47	75	2	3.36	236
The petrol stations I patronize do not manipulate its fuel pump	133	54	21	217	-	4.21	236
The petrol station I buy kerosene and fuel from sells its products at government approved prices	17	29	68	118	4	2.73	236

Source: Field survey (2017).

Table 3. Statistical analysis of the hypothesis.

Correlation		SL	SS
SL	Pearson correlation sig (2-tailed)	1	0.929[**]
		-	0.000
		236	236
SS	N Pearson correlation Sig (2-tailed)	0.929[**]	1
		0.000	-
**N Correlation is significant at the 0.05 level (2-tailed)		236	236

Source: Field survey (2017) software output.
Computation: SPSS Version 20.
Key: SL: Service location; SS: Service sustainability.

RECOMMENDATIONS

The petrol stations in Anambra State in addition to strict adherence to the rules of the approving authority in the location of their stations, developers must respect the location potential factors in locating a petrol service station. On the other hand, government should device strategies to enforce compliance of the rules and regulations of DPR on these petrol stations. Even the owners of these petrol stations should strengthen their union to help government in enforcing these rules and regulations. It will help to improve patronage and

performance, subsequently sustain the business.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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APPENDIX

Appendix A

Questionnaire

Questionnaire items	SA	A	UN	D	SD
The petrol station I buy fuel from is located close to residential building	-	-	-	-	-
Many petrol stations are located close to the petrol station I normally buy my fuel and kerosene from	-	-	-	-	-
Petrol stations should be sited meters away from residential buildings	-	-	-	-	-
Land should be allocated specially for petrol stations	-	-	-	-	-
Petrol stations located close to residential area can be dangerous to the health of the residents	-	-	-	-	-
The service rendered by the petrol stations I buy fuel and kerosene makes me to always patronize them	-	-	-	-	-
I am satisfied with the quality of products I buy from the petrol station	-	-	-	-	-
The petrol station I buy fuel and kerosene from always respond to complaints positively	-	-	-	-	-
The petrol station I patronize does not manipulate its fuel pump	-	-	-	-	-
The petrol station I buy kerosene and fuel from sells its products at government approved prices	-	-	-	-	-

Full Length Research Paper

Expected cost of financial distress in small and medium-sized enterprises (SMEs): A German-Italian comparison

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This study aims to identify a number of qualitative and quantitative elements that affect financial distress costs between Italian and German small and medium-sized enterprises (SMEs). We propose a model that interprets "expected costs" as the product between "expected financial distress likelihood" and "total amount of financial distress costs due to insolvency". The model is estimated using panel data methodology on samples from two European countries (Italy and Germany). The results indicate that expected costs depend on the use of derivative financial instruments, use of intangible assets and the relation with local banks (small local banks rather than large banking groups); in particular, the results obtained from cross-country comparison shows that German SMEs (or Mittelstand companies) have characteristics that limit financial distress costs. It should be emphasized that the present work limits its field of investigation to a few variables without fully addressing other elements of uncertainty which may adversely affect the expected cost of financial distress in SMEs. This work will be useful to stimulate debate on policies to support SMEs. The originality of this study is to focus on determinants of financial distress in SMEs using panel data methodology.

Key words: Cross-country comparison, derivative instrument, expected cost, financial distress, small and medium-sized enterprises (SME).

INTRODUCTION

This study is finalized to identify a number of qualitative and quantitative elements that affect financial distress costs of small and medium-sized enterprises (SMEs). The survey model analyzes SME samples from two European countries, Italy and Germany, whose financial and entrepreneurial systems show significant differences.

Data were extracted from BvD databases, and panel data methodology was used to control potential endogeneity and unobservable heterogeneity.

The results obtained applying survey model revealed that parameters are significant and with the expected signs. More specifically, the expected financial distress

costs decrease in relation SME's ability to provide themselves with intangible assets, derivative financial instruments and small partner banks (local banks rather than international banking groups).

Financial distress means severe liquidity problems that cannot be resolved without a sizable rescaling of the entity's operations or structure (Foster, 2005). Financial distress refers to the inability of the firm to pay current obligations on the dates they are due (Baldwin and Mason, 1983). Any enterprise is susceptible to financial distress if it has frequent cash shortages and few revenue streams. Therefore, small enterprises are more likely to experience financial distress. Companies facing insolvency often liquidate assets to settle debts. However, small enterprises have few assets to sell and tend to fall victim to secured creditors who focus on debt collection to the detriment of the firm (Gopinath, 1995). Several streams of research have explored financial distress. The literature on organizational decline describes this phenomenon in terms of a loss of slack or the surplus resources that cushion the firm against environmental jolts.

In line with studies by Keasey et al. (2015), we develop a definition of financial distress based on financial criteria. Thus, using an approximation of Keasey et al. (2015) concept of business failure, we consider financial distress companies as those that meet some of the following conditions:

(1) Its earnings before interest, taxes depreciation and amortization (Ebitda) are lower than its financial expenses for two consecutive years; and/or
(2) Increase in the debt-to-net worth formula for two consecutive periods with concomitant decrease of the denominator. Other previous studies on business failure have used those proxies (Manzaneque et al., 2016).

Post-crises financial costs are heavily influenced by a number of variables that characterize firm activity: intangible capital, financial partner type (local or not) and provision of financial derivative instruments; while the first two variables are useful to reduce informational asymmetries and thus to facilitate access to (re)financing, the third variable reduces the likelihood of financial crisis.

THEORETICAL BACKGROUND

The common causes of financial distress and business failure are often a complicated mix of problems and symptoms but the common causes of SMEs' failure and financial distress can be examined from different perspectives:

(1) The capital structure
(2) The degree of bank localism
(3) The size of the bank, the rating models adopted and,

the degree of customer relationship;
(4) The endowment of invisible intangible assets;
(5) The endowment of derivative financial instruments;
(6) The country's system.

Much of the literature agrees that SMEs are characterized by the high probability of financial distress; this phenomenon is justified by their typical capital structure (Keasey and Watson, 1993; Andrade and Kaplan, 1998; Frank and Goyal, 2009; Mac an Bhaird, 2010).

Capital structure theory begins with the Modigliani and Miller (1958) paradox of "capital structure irrelevance", where firm value is not affected by its financing mix. Since then, corporate finance literature has grown enormously and basically distinguishes between two main theoretical approaches (Balios et al., 2015):

(1) The trade-off theory
(2) The pecking order theory.

The core of the trade-off theory refers to the balancing process of benefits of debt (tax shield, reduction of agency costs of equity, lower issuance costs) and costs of debt (direct and indirect financial distress costs, rising agency costs of debt) which leads to the concept of an optimal capital structure. The pecking order theory emerges from the pioneering studies of Myers (1984) and Myers and Majluf (1984); these studies focus particularly on the concept of information asymmetries. Studies on information asymmetries have seen many authors focus on SMEs. Within this line of studies, there are several prospects of investigation: agency costs of equity and agency costs of debt. In this respect, precious are the studies of Scott (1977), Ang et al. (1982), Pettit and Singer (1985), van der Wijst (1989), Harris and Raviv (1990), Ang (1991, 1992), Holmes and Kent (1991), Psillaki (1995), Michaelas et al. (1999), Boot and Thakor (2000), Watson and Wilson (2002), Hall et al. (2004), Sogorb-Mira (2005), Daskalakis and Psillaki (2008), Frank and Goyal (2009), Psillaki and Daskalakis (2009), and Balios et al. (2015).

The theoretical debate about financial distress is rooted in the studies that explore the causes of credit rationing. In short, studies suggest a series of variables in computing bankruptcy likelihood. For instance, Diamond (1984), Fama (1985), Diamond (1991), Berger and Mester (1997), Cesarini and Ferri (1997), Uzzi and Gillespie (1999), Goddard et al. (2001), De Laurentis (2001), DeYoung et al. (2004), De Bruyn and Ferri (2005), De Laurentis (2011), and Chen and Yao (2017) suggest to investigate the degree of bank localism (bank proximity). Other authors suggest to investigate the size of the bank, the rating models adopted and, the degree of customer relationship (Jayaratne and Wolken, 1999; Berger and Udell, 2002; Stein, 2002; Takats, 2004; Berger et al., 2005; Berger and Udell, 2006; Formisano,

2016).

The endowment of intangible assets not visible on the financial statements can affect the financial distress of the enterprise. In this regard, there are two different schools of thought. The first current of thought states (Harris and Raviv, 1991; Degryse and Ongena, 2002; Frank and Goyal, 2003; Berry, 2004; Cohen, 2005; Heiens et al., 2007; Hulten and Hao, 2008; Parsons and Titman, 2009; Fukao et al., 2009; Degryse et al., 2010; Roulstone, 2011; Campello and Giambona, 2011; Marrocu et al., 2012; Koksal et al., 2013; Lim et al., 2014; Bulot et al., 2015; Cucculelli and Bettinelli, 2015):

«Firm specific skills, invisible in the budget and that escapes from the traditional analysis, are strategic factors to get out of the business crisis or to alleviate bankruptcy/financial distress costs».

More specifically, part of this school of thought states that firm specific skills allows the (re)financing under economic conditions to restructure their business. The second school of thought, on the other hand, points out that intangibles not visible at the accounting level are a source of problems which ultimately reflect negatively on the company's ability to contain financial distress costs.

In this regard, some authors point out that the high intangible capital endowment it's not easily perceivable and quantifiable by stakeholders outside the firm, it determines significant information asymmetries between shareholders/management and third lenders (Warner, 1977; Haugen and Senbet, 1988; Cutler and Summers, 1988; Giammarino, 1989; Altinkilic and Hansen, 2000; Thorburn, 2000; Jostarndt and Sautner, 2010; Gennaioli and Rossi, 2010; Ashraf and Zheng, 2015). These information asymmetries increase when the lender adopts transaction-based banking model rather than relationship-based model, which favors the collection of quantitative and standardized information (hard information). Other authors point out that distressed firms with plenty of intangible assets sustain high indirect costs of bankruptcy (Gilson et al., 1990; Asquith et al., 1994; Alves and Martins, 2014).

The theoretical debate about financial distress lights up further with the analysis of the role of derivatives. Empirical studies show that bankruptcy costs is a further source of incentive for the use of derivatives. Many empirical studies indicate that the use of derivatives is positively reflected on the creation of firm value. Hedging financial risks (currency, interest rate and commodity risk) reduces the volatility of cash flows and therefore allows the attracting funding to get out of the financial crisis or to mitigate exit costs from the market. Such evidence emerges from numerous studies (Stulz, 1984; Hoshi et al., 1991; Bessembinder, 1991; Dobson and Soenen, 1993; Froot et al., 1993; Geczy et al., 1997; Gay and Nam, 1998; Minton and Schrand, 1999; Haushalter, 2000; Mello and Parsons, 2000; Allayannis and Ofek,

2001; Haushalter et al., 2002; Iqbal; 2015; Shaowen (2015).

The study analysis of literature ends with a further aspect: the country's system. The aspects analyzed so far in the literature have to be interpreted in relation to the political, financial and entrepreneurial system of the country. German SMEs (so-called Mittelstand) have their own peculiarities to Italian SMEs. Their business policies tend to be especially long-term. The "German Mittelstand" companies are some of the most innovative in Europe: 54% of them launched an innovation onto the market in the 1999 to 2006 period. The "German Mittelstand" relies on sound financing models - chiefly equity and bank loans. The high equity ratio and a cautious approach to expansion enable the companies to undertake medium-term and long-term investments, even in times of crisis. Government supports the "German Mittelstand" on key issues like investment in R&D, the skills shortage, foreign trade and investment, financing needs, company start-ups and company hand-overs. The empirical evidence indicates that Germany's Mittelstand is exploiting its full potential to raise funds via alternative financing instruments (Casey and O'Toole, 2014).

It should be noted, in particular, German government's policy to achieve a tax and accounting system capable of encouraging the use of derivatives. The same is true for the use of public support programmes given. Unlike bank-firm relationships in Italy, the ones from Germany have their own features (Audretsch and Elston, 1997; Hainz and Wiegand, 2013):

(1) Mittelstand companies have close, confidential and long-term-oriented relationship with one main bank, their "house bank".
(2) Companies are willing to disclose sensitive economic data
(3) Relatively easy access to long-term bank loans, even under difficult economic circumstances.
(4) Broad supply of public (financial) support programmes on national and land-level, delivered mainly via house banks.
(5) The German "house bank" system valorize soft information in rating systems (through-the-cycle ratings).

Research hypothesis, data and empirical model

Most of the data used in the paper are taken from databases maintained by Bureau Van Dijk: Amadeus (a high quality European database), Aida and Mint Italy. From these databases, we gather information on the firm specific data, ownership data, and accounting data for every German and Italian company that satisfies a maximum size threshold. For Germany and Italy, the databases includes all companies that meet the following criteria:

(1) Revenues not exceeding €20 m
(2) Less than 250 employees
(3) Organized in the form of Ltd.

The study sample period started in 1999 (the first year for which we

can gather ownership data from the DVDs) and ends in 2006 (the last year before the outbreak of the crisis). Statistics are based on a sample of approximately 37.787 SMEs, and covers the 38% of the universe of small and medium sized enterprises active in Italy and in Germany at the end of 2006. The investigation has required 385.671 statistic observations.

We consider two measures of risk of bankruptcy. The first measure, Ebitda, is a measure of the degree of financial stress. The intuition is simple: the lower the Ebitda, the greater the company's inability to cover financial expenses. The second, debt-to-net worth is a measure of the degree of fragility of the entire financial structure; this was classify as deteriorated in the financial structure that introduces an increase in the debt-to-net worth formula for two consecutive periods with concomitant decrease of the denominator. A firm is also considered as financially distressed in the year that immediately follows these events.

From this classification, we can build a variable that captures the probability, ranging from 0 to 1, of a firm becoming financially distressed. We expect this financial distress likelihood to have a positive impact on the cost of financial distress. In the light of this study consideration we formulate four research hypotheses. Therefore, the first hypothesis is [*H1*]:

Regardless of the country of origin of the firm, financial distress likelihood and (ex-ante) financial distress costs are positively correlated

The analysis continues with the formulation of further three research hypotheses that show, regardless of the country of origin of the enterprise, the negative correlation with the expected financial distress costs (ExpFDC): Intangible assets (hypothesis 2), Banking localism (hypothesis 3) and Derivative financial instruments (hypothesis 4).

With respect to the second hypothesis, we believe that the weight of intangible assets (not recognised in the financial statements and its disclosure notes) on total assets (INTAN) is a useful indicator to understand the company's ability to create value. Moreover, it is important to emphasize the fact that, in the restructuring phase, intangibles create the premises to begin refinancing processes on advantageous terms

For the enterprises subject to restructuring, there are some focal aspects (Lenz, 1981; McNair et al.,1990; Neely, 1999; Bontisa et al., 1999; Buckmaster, 2000; Unger, 2000; Joia, 2000; Ching and Yang, 2000; Harris and Ogbonna, 2001; Dubrovski, 2001; Hoque et al., 2001; Schwarz et al., 2002; Catasús and Gröjer, 2003; Katcher, 2003; Kumar, 2017): clientele's quality, contractual power with the suppliers, reliability of the plans and sustainability of the investments, R&D investment, process control systems, management skills, credibility of management, brand development, investment in training, after sales, entrepreneurship and management experience, business continuity, and governance. Such data have been picked after an access to BvD databases.

The data have opportunely been quantified through a scoring and normalization process, and in order to get homogeneous values among 0 and 1 (Min. 0 - Max 1). Table 1 highlights the main results of the normalization process. Accordingly, the second research hypothesis affirms as follows [*H2*]:

Regardless of the country of origin of the firm, invisible intangible assets and expected financial distress costs (ExpFDC) are negatively correlated

Without prejudice to the previous considerations, the study research is enriched with the formulation of the following hypothesis [*H3*]:

The negative correlation between invisible intangible assets and expected financial distress costs (ExpFDC) is more significant if firm has local bank as partner. This correlation is considered valid

regardless of the country of origin of the enterprise

The third hypothesis of the research is verified using a dummy variables "LOCALB". In particular, we would use a 0. 1 dummy variable where a firm is given a value of 1 if it is a client of a local bank or a 0 in case of the presence of a national and/or international banking group. The typology of partner bank of the enterprise has been individualized by accessing BvD databases. This variable influences the study model in the part that considers the weight of the invisible intangible assets on total assets (INTAN); the dummy LOCALB variable assumes a critical role in estimating the effects of the intangibles on the expected financial distress costs (Table 1).

With reference to the fourth and last hypothesis, Smith and Stulz (1985) show that bankruptcy costs is a further source of incentive for the use of derivatives. The same conclusions are received from these studies Tuckman (2016), Xiao (2017), Bae et al. (2017) and Carroll et al. (2017). In fact, by reducing the fluctuations in corporate flows, hedging through derivatives makes it possible to reduce the likelihood of a financial crisis, which can lead to extremely critical situations such as bankruptcy, liquidation or, at the very least, corporate restructuring and the need to bear direct costs (legal costs, administrative costs and the lesser value attributed to assets at the time of liquidation) and indirect (loss of image and consequent reduction in contractual power) of a very high amount.

Based on this model, the likelihood of using derivatives is greater for companies with high financial loss costs. If these costs, as Nance et al. (1993) point out, are a fixed component, then smaller companies will be the ones that will most effectively use hedging derivatives because they have a stronger impact on the fixed component of costs. These statements were shared by Tuckman (2016).

In addition, given the ability of derivatives to reduce the company's default probability, they also make it possible to increase the level of indebtedness, and thus the value of the enterprise. In particular, this theory was developed by Stulz (1984) and Xiao (2017), where they suggests that by reducing the volatility of company profits and hence the likelihood of financial stress, the company is able to increase its potential debt capability. If companies increase leverage in response to this higher debt capability, the associated increase in financial burdens will lead to a reduction in taxation and, consequently, an increase in the value of the company. Starting from the foregoing considerations, the following search hypothesis is examined [*H4*]:

There is a negative correlation between SMEs' derivative financial instruments and expected financial distress costs (ExpFDC). The greatest endowment of derivatives determines the reduction of the expected financial distress costs. This correlation is considered valid regardless of the country of origin of the enterprise.

With reference to the hypothesis 4, it is believed that the endowment of derivative financial instruments on the total assets of a firm (DER) - shows the amount of derivative financial instruments as a percentage of total assets - is a measure of its ability to reduce the likelihood of financial distress. The study model was designed to provide a representation of the value loss of SMEs in financial crisis. This section clarifies how "probability of financial suffering" and "ex-post financial aid costs" can be useful drivers in building a model for estimating ex-ante financial distress costs.

In literature we see a rich literary production engaged in the formulation of ex-ante models to estimate the financial distress likelihood (FDL). Particularly, Grice and Ingram (2001), Pindado et al. (2008), Keasey et al. (2015) and Gupta et al. (2015) underline that the seminal models by Beaver (1966), Altman (1968, 1984) and Ohlson (1980) are revealed suitable in the classification of the sector (better for the manufacturing enterprises) but poorly sensitive

Table 1. Normalization process.

Focal aspects	Scoring	N. observations of total sample	N. observations Italian sample	N. observations German sample	Average score total sample	Norm (0-1) total sample
Clientele's quality	Min 28; Max 44	37787	25715	12072	29	0.20161
Contractual power with the suppliers	Min 28; Max 44	37787	25715	12072	33	0.45641
Reliability of the plans	Min 28; Max 44	37787	25715	12072	30	0.43323
R&D investment	Min 28; Max 44	37787	25715	12072	35	0.59692
Process Control Systems	Min 28; Max 44	37787	25715	12072	32	0.40006
Investment in training	Min 28; Max 44	37787	25715	12072	34	0.56014
Sustainability of the investments	Min 28; Max 44	37787	25715	12072	31	0.48897
Brand development	Min 28; Max 45	37787	25715	12072	37	0.78961
Credibility of management	Min 28; Max 45	37787	25715	12072	40	0.80010
After Sales	Min 28; Max 45	37787	25715	12072	43	0.89988
Entrepreneurship and management experience	Min 28; Max 45	37787	25715	12072	41	0.82243
Business continuity	Min 28; Max 45	37787	25715	12072	39	0.78013
Governance	Min 28; Max 45	37787	25715	12072	38	0.72215

Source: the study elaboration on BvD data.

to the typology of financial distress of the enterprise. To analogous conclusions, the studies of Zmijewski (1984) are reached. The aim of this section is to outline the empirical approach that we use to analyse the FDL. In this regard, we fellow Pindado et al. (2008) and Keasey et al. (2015), where FDL is specified as a function of three ratios (1):

$$\log\left(\frac{\text{Prob}(\text{Insolvency})}{\text{Prob}(\text{NoInsolvency})}\right) = \beta_0 + \beta_1\left(\frac{\text{EBITDA}_{it}}{\text{TA}_{i\text{-}1}}\right) + \beta_2\left(\frac{\text{FE}_{it}}{\text{TA}_{i\text{-}1}}\right) + \beta_3\left(\frac{\text{RE}_{it\text{-}1}}{\text{TA}_{it\text{-}1}}\right) + \varepsilon_{it} \tag{1}$$

The first ratio (EBITDA ÷ Total Assets) measures operating efficiency apart from depreciation, amortization, tax and leveraging factors. It is also an indicator useful to understand the firm's ability to attract financial resources or renegotiate debts. The second ratio (Financial Expenses ÷ Total Assets) indicates the impact of financial expenses on FDL; as with other model variables, it is scaled by total assets. The last ratio (Retained Earnings ÷ Total Assets) measures cumulative profitability over time as a proportion of total assets. FDL variable originates from proposed regression model; its value ranges between "0" and "1". It

appears evident as the FDL variable has a positive impact on the (ex-ante) financial distress costs (ExaFDC). Following financial distress, the company's loss of value is identifiable in terms of ex-post financial distress cost (ExpFDC). Consistent with the study ExaFDC definition, ex-post costs represent discount factor in estimating future firm value. In line with this, Keasey et al. (2005) model sees financial distress costs depends on FDL, expected cost of financial distress are quantified in terms of weighting of ExpFDC by the likelihood of financial distress (2):

$$\text{ExaFDC} \cong \text{ExpFDC} \times \text{FDL} \tag{2}$$

Consistent with the study ExaFDC definition, this can be represented in formula as follows (3):

$$\text{ExaFDC} = \text{FDL} \times e^{\beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 \ldots + \beta_n X_n} \tag{3}$$

Given that estimating a linear model has undoubted advantages in econometric analysis, the sides of the previous equation have been restated by taking natural

logarithms (4):

$$\varphi = \frac{1}{\tau} \ \mathrm{LnFDL} + \frac{\beta_1}{\tau} \ X_1 + \frac{\beta_2}{\tau} \ X_2 + \frac{\beta_3}{\tau} \ X_3 \ldots + \frac{\beta_n}{\tau} X_n$$

(4)

In line with Keasey et al. (2005) directions:

LnFDL is the natural logarithm of financial distress likelihood and τ is the horizon of time over which firms formulate expectations for the resolution of financial distress. Consequently, the estimated coefficients a₁, a₂ and a₃ represent the adjustment rate of the value of the firm due financial distress, devided by the number of periods till the resolution of financial distress.

The above mentioned directions lead to the following Equation 5:

$$\alpha_1 = \frac{1}{\tau}; \ \ \alpha_2 = \frac{\beta_1}{\tau}; \ \ \alpha_3 = \frac{\beta_2}{\tau}; \alpha_4 = \frac{\beta_3}{\tau}$$

(5)

We can see the following Equation 6 holds:

$$\varphi_{it} = \alpha_1 \mathrm{LnFDL}_{it} + \alpha_2 X_1 + \alpha_3 X_2 + \alpha_4 X_3 + \varepsilon_{it}$$

(6)

Equation 6 is completed with the attainment of the influential variables in the study model (7):

$$\varphi_{it} = \alpha_1 \mathrm{LnFDL}_{it} + \alpha_2 \mathrm{INTAN}_{it} + \left(\alpha_3 + \lambda_1 \mathrm{LOCALB}_i \right) \mathrm{INTAN}_{it} + \alpha_4 \mathrm{DER}_{it} + \varepsilon_{it}$$

(7)

Equation 7 highlights the variables (X_i) influencing our model:

(1) The ability to equip itself by invisible intangible assets (INTAN)
(2) The privileged relationship with local banks (LOCALB), and
(3) Financial derivatives usage by SME (DER).

All the variables in formula 7 are scaled by total assets in order to reduce frequently heteroskedasticity problems presents in regression models. In this model, the disturbance term, ε_{it}, is composed by the following investigation elements: $\varepsilon_{it} = \eta_i + d_t + v_{it}$, where v_{it} is a statistical fluctuations (error), and d_t is a yearly dummy variable reflecting macroeconomic factors. Finally, η_i is the SME individual effect; in this study, this variable captures those individual-specific effects that are time constant and impact on financial distress costs. Table 2 shows the number of firms from each country.

RESULTS

Summary statistics of the total sample are reported in Table 3. As a general rule data were trimmed at 99th percentile. Table 3 shows the standard deviation, mean, minimum and maximum values of the main variable, and Table 4 shows the results of the basic and local banks adjusted model.As shown in Table 3, the average stake of intangibles is around 45% of total assets. The average ratio of derivatives to total assets is 9.8%.

As can be in Table 4, all the coefficients are statistically significant and of the expected sign. The m_2 test detects that there is no second-order serial correlation and Wald test confirms that macroeconomic events can affect all firms. We ran a regression analysis using panel previously described (Normal: 68.2%; Financial distressed: 31.8%).

In future studies, we shall include further means such as Conic Multivariate Adaptive Regression Splines (CMARS), Robust Conic Multivariate Adaptive Regression Splines (RCMARS) and Conic Generalized Partial Linear Models (CGPLM). These methods can help to give new perspectives and developments in financial mathematics to make more accurate predictions about financial distress likelihood.

Several studies have been carried out to apply the aforementioned methods to various fields of study including finance, industry, business and environment. These includes; Özmen et al. (2010), Özmen et al. (2012), and Weber et al. (2012).

The empirical evidence corroborates this study initial hypothesis. As shown in column 1 of Table 4, the positive coefficient of the FDL variables confirms hypothesis 1 (*H1*: Regardless of the country of origin of the firm, financial distress likelihood and (ex-ante) financial distress costs are positively correlated) and supports the evidences emerged by Keasey et al. (2005) studies that the FDL is one of the main explanatory variables of financial distress costs.

Additionally, to confirm the second hypothesis (*H2*: Regardless of the country of origin of the firm, invisible intangible assets and expected financial distress costs (ExpFDC) are negatively correlated), we find empirical evidence supporting the negative correlation between SMEs' invisible intangible assets and expected financial distress costs, since the coefficient ($\beta_{1-\text{Total sample}} \div \tau = -0.2258$) obtained for INTAN_{it} is negative and significant.

The third hypothesis (*H3*: The negative correlation between invisible intangible assets and expected financial distress costs (ExpFDC) is more significant if firm has local bank as partner. This correlation is considered valid regardless of the country of origin of the enterprise) is tested using the dummy LOCALB_{it}. The negative correlation between SMEs' invisible intangible assets and expected financial distress costs (ExpFDC) is more evident for the SMEs that relate to local banks: $\beta_{2-\text{Total sample}} \div \tau + \lambda_1 \div \tau = -0.2258 - 1.5678 = -1.7936$. This finding confirms the results that emerge from the doctrine: the ability of local banks to attenuate information asymmetries that, especially in the phases of restructuring for financial distress, are critical in the bank-firm relationship.

The fourth hypothesis (*H4*: There is a negative correlation between SMEs' derivative financial instruments and expected financial distress costs

Table 2. Structure of the samples by country.

Country	Firms
Italy	25000
Germany	12072
Total	37072

Table 3. Summary statistics of the total sample.

Variable	Mean	SD	Minimum	Maximum
ExaFDC	-0.077	0.687	-2.798	0.579
LnFDL	-1.896	1.723	-6.988	-0.098
INTAN	0.457	0.158	0	1
DER	0.098	0.355	-2.987	0.689

Source: The study elaboration on BvD data.

Table 4. Results of the basic and localb adjusted model.

Model	Basic (total sample)	LOCALB adj. model	Italian sample	German sample
N. of SMEs	37787	37787	25715	12072
т	11.09	10.7	12.01	8.4
$LnFDL_{it}$	0.0999 (0.0000)	0.0883 (0.0000)	0.0823 (0.0000)	0.0900 (0.0000)
$INTAN_{it}$	-0.2258 (0.0000)	-1.7867 (0.0000)	-0.1832 (0.0000)	-0.7811 (0.0000)
$LOCALBINTAN_{it}$	-	-1.5678 (0.0001)	-1.4001 (0.6333)	-1.6956 (0.3410)
DER_{it}	-1.0006	-1.1445	-1.5367	-1.8874
z_1	758.2323	326.0089	500.6897	482.3666
z_2	206.2199	212.3456	199.2624	202.5589
t_1	-	9.0000	-	-
t_2	-	11.1025	-	-
m_1	0.0000	0.0000	0.0000	0.0000
m_2	0.0456	0.1022	0.0689	0.0489
m_3	0.5598	0.6589	0.5001	0.4589
Hansen	1658 (33)	1879 (105)	1101 (52)	1178 (78)

Source: The study elaboration on BvD data.

(ExpFDC). The greatest endowment of derivatives determines the reduction of the expected financial distress costs. This corrrelation is considered valid regardless of the country of origin of the enterprise) is tested using DER_{it}. As shown in column 1 of Table 4, the negative term ($ß_{3-Total\ sample}$ ÷ т = -1.0006) confirms the study hypothesis 4. In line with the evidence emerged by literature review, the greatest endowment of derivatives determines the reduction of the expected financial distress costs.

Moreover, the results obtained from the study cross-country comparison, provide additional evidence. Without prejudice to previous assumptions, Germany, compared to Italy, recorded more significant coefficients. Considering the first hypothesis (*H1*) as universally valid,

the most significant differences can be found in the other three hypotheses of research. In summary, German SMEs have their own peculiarities to Italian SMEs (Abel-Koch et al., 2015).

With regard to the second hypothesis (*H2*), the largest coefficient ($ß_{1-German\ sample}$ ÷ т = -0.7811) is justified by Germany's highest R&D investments: 33% of German companies invest 1% in R&D (24% invest 2%, 18% invest 4%, and 25% invest more than 4%). A key to the success of the "Made in Germany" strategy is, moreover, the After Sales, organized efficiently, precisely and in a very short time. Another important factor contributing to the success of the German Industry is the Common Labor Market - synergies through industry training - which shows that there is less competition in Germany than

Italian reality.

Certainly, greater financial solidity has been a key driver of the creation of world-leading industry leaders. While the suffering in Italy is 3 times higher than in Germany. Another interesting fact is that 61% of Mittlestand has an Advisory Board or Supervisory Board and 67% of the Advisory Board is made up of owners of other companies. Business continuity, entrepreneurship and management experience are also important drivers in generational steps.

With reference to the third hypothesis (*H3*), the coefficient recorded by the German sample ($ß_{2-German sample} \div \tau + \lambda_1 \div \tau = -2.4767$) is more significant than the Italian one and in line with the study hypotheses. As mentioned earlier, there are several factors that justify these differences. Mittelstand companies show strong relationships with local banks and, in particular, the German "house bank" system valorize soft information in rating systems. This is for the benefit of firms that have skills that are not visible at the accounting level.

In addition, the German banking system is characterized by maximum transparency. For example, in Germany, under the Initiative Finanzstandort Deutschland (IFD), banks tell enterprises their rating. In the context of the implementation of the Basel III Accord and to improve financial dialogue between the financial community and the public, IFD, working with the German banking associations, developed a brochure that explains in layman's language the nature of internal and external ratings and the advantages of ratings for SMEs. Although the IFD has been superseded, this brochure is still often referred to as a standard of quality and has contributed to the development of a "rating culture" in Germany.

With regard to the fourth hypothesis (*H4*]), German financial system shows peculiarities respect Italian system ($ß_{3-German sample} \div \tau = -1.8874$). These peculiarities concern the use of derivatives. Compared with Italian companies, German companies are more likely to use derivatives: 78% of German SMEs than 24% of Italian SMEs. As previously mentioned, German government's policy has been active to ensure a tax and accounting system capable of encouraging the use of derivatives. German firms are more likely to use derivatives than Italian firms. This is consistent with Germany being an open economy, leading to greater exposure of its firms to financial price risk, especially foreign exchange rates and commodity prices. Italian companies use less derivatives than German companies.

The use of derivatives is more significant among large companies for each category of risk suggesting the presence of economies of scale in the use of such tools. The most heavily hedged type of risk is the exchange rate risk followed by interest rate risk and ultimately credit risk. A recent Bank of Italy's annual report highlights that category of financial risk hedging services presents the most modest use grade. It also emerges that the SME has a low ex-ante perception of exchange rate risk and,

above all, the risk of interest. In addition, entrepreneurs are experiencing strong commercial pressure from banks on this product category, which is not balanced by proper coordination with financing operations.

DISCUSSION

The estimate of the variables LnFDL, INTAN, LOCALBINTAN and DER is useful in building a "matrix" capable of suggesting, at country level, policies for Italian SMEs for tackling the crisis as well as to mitigate the costs of exit from the market (Figure 1). SMEs have financial constraints that, compared with large companies, diminish the benefits of their expertise.

As evidenced by the results of this study research, expected financial distress costs are intimately linked to a number of variables considered influential in this analysis: the intangible assets, the close relationship with local banks and, the use of derivative instruments commonly used for risk management. German firms compared with Italian ones are more immune to financial distress phenomena and have been able to develop antidotes useful to face the crisis painlessly; the motives are different and must be sought in entrepreneurial culture and in the decisive role of Germany's government and local banks to support SME development policies (Figure 1).

German SMEs developed market leadership in global niches thanks to the high capacity of innovation and traditional skills that have kept pace with the technological innovation at a global level. Germany's government acknowledges their importance, and in 2012 launched an initiative to make "German Mittelstand" logo a quality brand that helps businesses both in expanding on global markets and skilled workers recruitment. The critical role of SMEs in Germany justifies the existence of governmental programmes that support their development.

In general, the policy of the financial support for the SMEs in Germany is concentrated on the promotion of the investment process, leaving the short-term financing to the private and cooperative bank sector. As a result, a strong relationship between cooperative banks and credit boxes is registered in the SMEs's financing.

In the financial field, the hybrid instruments are what is considered to be the center floor in architecture. In Germany, the instrument named "Mezzanine Kapital" has been developed with the aim of covering the intermediate spectrum (hybrid) between the own capital and the debt during the last years (Ulrich and Hilmar, 2003).

The emergency of this type of hybrid instruments originated as collateral tools of the business of the banks (operations of high performance but of high risks) in The United States and The United Kingdom in the seventies. In the eighties, the hybrid instruments were transformed into the ideal vehicle for the concision of the MBO
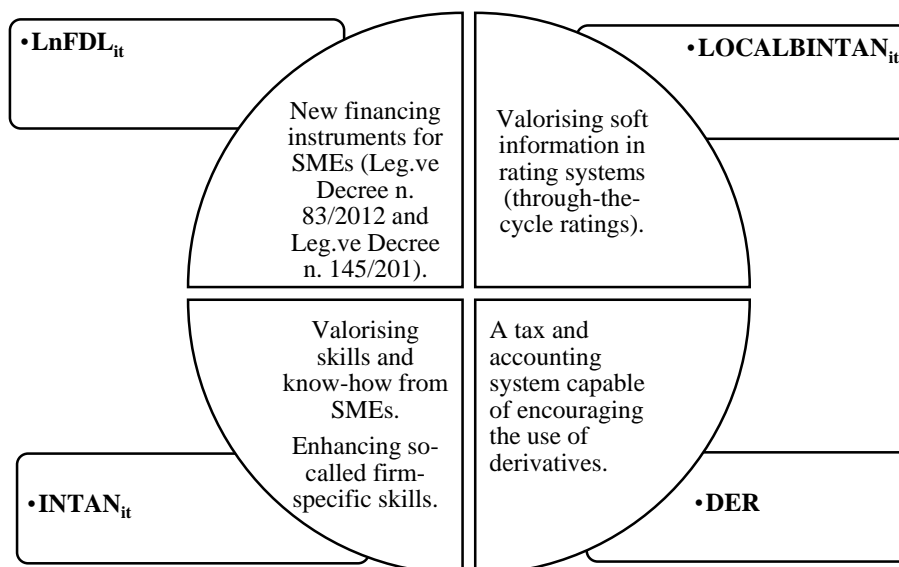
Figure 1. Policy matrix.
Source: The study elaboration.

operations and, at the same time, they were turned into an alternative for investors who look for high performances.

In Germany, the hybrid instrument had an important development that helped it being transformed into the third market with a world-importance at present. Mezzanine Kapital constitutes the German version of the financial hybrid instruments whose institutionalization is given through the equity issues of participation in order to attract investors and the divisibility of the application of the fund constituted in the SMEs.

Another mechanism present in Germany is the financing through the VC. Taking into account the "Own Capital" financing matter, an intensive field of VC activities through the specific legal figure over societies of participation in capital (KapitalBeteiligungsGesellschaft) has been developed in Germany since the nineties.

In order for the banks to achieve a better ratio performance-risk, they may enter a business to finance the process of creation of the Mittelstand companies replacing the traditional loan scheme with the use of the financial hybrid instruments via. For instance, the equity kickers constitute a vehicle that was proved in order to step up the performance with the receipt of the interests of both parts, agent and principal.

Local banks play an important role in Mittelstand financing. The savings and cooperative bank sector in Germany accounts for a distinctly higher share in credit financing of SMEs than in the Italy; compared to Italian SMEs, German SMEs have longer and closer relationships to their banks. In Germany, intensive competition among banks favours the establishment of long and close bank relations of SMEs, which improves the availability of loans. As shown by recent Bundesbank's annual report, banks, in particular small banks, adopt internal rating methodologies aim a through-the-cycle rather than at point-in-time rating; as already mentioned, such rating systems favor SMEs.

Financial instrument are be designed for the Mittelstand companies with due regard to the investors's interests and the capital needs that the Mittelstand companies must face; in this regard, the Kreditanstalt fuer Wiederaufbau K (fW) public bank plays an important role as the country's industrial policy instrument. KfW's supports COSME's promotional activities for start-ups within the "Start-Up Loan – StartGeld". KfW's supports InnovFin's promotional activities for innovative companies. With the help of a guarantee from the European Investment Fund KfW assume 80% of the credit risk normally incurred by the banks.

In many cases, this makes the loan financing possible for start-ups. The "Start-Up Loan - Universal" also enables companies to finance succession and takeover projects, an aspect that is becoming increasingly important in light of demographic changes. KfW offers a broad range of promotional programmes for SMEs financing needs, such as the "ERP Innovation Programme" or the "ERP Regional Promotion Programme".

The "ERP innovation program" supports SMEs by providing long-term loans at favourable conditions for close-to-market research and development of new products, processes or services; the aim of "ERP Regional Promotion Programme" is to promote investments in structurally weak regions at particularly attractive conditions. Considering the results of the study

and taking into consideration the German experience, the following remarks are suggested for tackling the crisis as well as to mitigate the costs of exit from the market:

(1) "New financing instruments". Even though Italy shows poor financial culture than Germany, current government policies are moving in the right direction. As evidenced by a recent study (Quintiliani, 2017a,b), at the end of 2012, the legislator intervened to facilitate the debt instruments' issuance for SMEs (mini-bonds, commercial papers, project bonds, equity crowdfunding). In fact, with the "Decreto Sviluppo" (legislative decree n. 83/2012) and "Decreto Destinazione Italia" (legislative decree n. 145/2013), they have eliminated fiscal constraints that hindered the debt capital issuance by companies not listed on a stock exchange. The lawmaker's goal was to diversify the sources of financing for SMEs in order to reduce the credit crunch and their financial dependence from the banking system. Thanks to the new legislation SMEs, but not "micro-companies", are allowed to issue debt instruments with short term (commercial paper), medium and long-term (mini-bond, project bond, equity crowdfunding);
(2) "Valorising soft information in rating systems". Italian banking system is strongly oriented to using cyclical internal rating systems that value hard information. Small local banks (for example, cooperative credit banks), unlike large banks, are more willing to evaluate soft information but have some structural limits: small size, poorly qualified staff, and a supply limited at traditional bank lending activities. A new "rating philosophy" is suggested that does not neglect the relationship with the clientele and that encourages "through-the-cycle" evaluation processes capable to capture and mix the positive elements of the statistical model with the positive elements of the judgemental model;
(3) "Valorising skills and know-how". Italian SMEs are characterized by innovation, proactivity and risk appetite, but their small size is a limit in a globalized context that lives a Fourth Industrial Revolution. In this sense, the "National Industry 4.0 Plan" is undoubtedly an important signal, and on this road it will be necessary to continue;
(4) "A tax and accounting system capable of encouraging the use of derivatives". The current system sees increased taxation on derivatives and their recording on-balance-sheet according to Italian Accounting Standards (OIC 32). This system discourages the use of derivatives and impacts negatively on the company's ability to mitigate financial distress. It is therefore suggested a low taxation and the recording on-balance-sheet as "memorandum item";
(5) All the findings in this research can be used for supporting or even completing other studies with similar or same concept, after necessary adjustments have been made.

In conclusion, the results of this study are in line with those emerging from the literature that consider the value

loss of the enterprise in financial distress strongly correlated to the following aspects:

(1) The endowment of invisible intangible assets (Harris and Raviv, 1991; Degryse and Ongena, 2002; Frank and Goyal, 2003; Berry, 2004; Cohen, 2005; Heiens et al., 2007; Hulten and Hao, 2008; Parsons and Titman, 2009; Fukao et al., 2009; Degryse et al., 2010; Roulstone, 2011; Campello and Giambona, 2011; Marrocu et al., 2012; Koksal et al., 2013; Lim et al., 2014; Bulot et al., 2015; Cucculelli and Bettinelli, 2015), (2) Bank proximity (DeYoung et al., 2004; Berger et al., 2005; Carter and McNulty, 2005; Udell, 2008; DeYoung et al., 2008; Modina, 2015; Formisano, 2016).
(3) Derivative financial instruments (Stulz, 1984; Smith and Stulz, 1985; Nance et al., 1993; Mello and Parsons, 2000; Allayannis and Ofek, 2001; Tuckman, 2016; Xiao, 2017; Carroll et al., 2017).

It should be emphasized that the present work limits its field of investigation to a few variables without fully addressing other elements of uncertainty which may adversely affect the financial distress likelihood and the value creation of the SME. An interesting starting point for future research is indeed represented by application of additional methods (RCMARS and CGPLM) useful to mitigate the uncertainty of the forecast and capable to analyzing further variables nonlinearly (environmental, political, social and labor).

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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