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Original Article

Determinants of Financial Performance and Default Prediction: An Empirical Study on Select Commercial Banks in Ethiopia

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Abstract *- The current trend of the Ethiopian banking industry is showing progressive performance, and almost all banks are reporting positive accounting profits. However, profit reported by banks is not a guarantee for survival and to fulfill their obligations. The main purpose of this research is to identify factor determine the financial performance and to predict default probability of selected commercial banks in Ethiopia. A total of 8 commercial banks, including one public sector bank, were selected based on their operational existence for more than 10 years. The study adopted a quantitative research approach. By using panel data, the bank's financial statements for the period 2005-2016 were considered for the study. Regression analysis was conducted by using E-views 9 software. The findings of the study revealed that capital adequacy, earning ability, operating cost, and the exchange rate have significantly affected the financial performance of commercial banks measured by return on asset and return on equity. Further, the financial health conditions of the selected commercial banks were analyzed using the Altman Z score model (ZETA Analysis) to predict financial distress. The finding of the study shows that the financial health of the selected commercial banks proved good and improving from time to time, even though fluctuations were noticed in some banks. Based on the study result, it is recommended that banks need to adopt efficient managerial skills and practices to have sustainable development and an edge over their competitors. In addition, the study recommends that customers and investors can rely on private commercial banks as an alternative similar to government commercial banks.*

Keywords *- Financial Performance, Return on Assets, Return on Equity, default prediction, Altman Z-score*

I. INTRODUCTION

Commercial banks play a vital role in the economic resource allocation of countries. They channel funds from depositors to investors continuously. Especially in developing countries like Ethiopia, where there is a shortage of capital, commercial banks become more important. They help both consumers and businesses to raise funds and to meet their needs. Good financial performance rewards the shareholders for their investment. This, in turn, encourages additional investment and brings about economic growth. On the other hand, poor banking performance can lead to banking failure and crisis, which have negative repercussions on economic growth.

The financial health of commercial banks is of great significance keeping in view the economic development of the country and for all its stakeholders' wellbeing. The financial performance of commercial banks may be influenced by factors such as bank size, capital adequacy, liquidity, market structure, and economic growth. Some of these factors may have a positive impact on the bank's profitability, while others could have a negative impact. Further, some of the factors that affect the profitability of a bank could be under the control of the bank's management (internal factors), and the others could be beyond its control (external factors). Knowledge of the underlying internal and external factors that affect the financial performance of a bank is vital for policymakers and bank supervisors, and regulators in framing future policies aimed at improving the financial performance of the banking sector [7] and [9].

In a country like Ethiopia, where commercial banks are active in the financial sector, any failure in the sector has an immense implication on the economic growth of the country. This is due to the fact that any bankruptcy that could happen in the sector has a contagion effect that can lead to bank crises and bring overall financial calamity and economic tribulations. In the rapidly changing economic environment, all the stakeholders of the commercial banks should always be keen on knowing financial distress well in advance to be on a safer edge. Altman Z score model is used in the direction of predicting the default probabilities of commercial banks in Ethiopia. Based on the above backdrop**,** the objectives of this study are:

- To examine the impact of internal and external factors on the financial performance of selected commercial banks in Ethiopia.
- To predict the default probabilities of selected commercial banks in Ethiopia.

II. RESEARCH METHODOLOGY

This part discussed the research methodology employed to achieve the objectives of the study.

A. Types and Source of Data

Secondary data was used to examine the determinants of bank performance. The data for the bank-specific factors were collected from the National Bank of Ethiopia (NBE) and from the respective commercial banks. But for the external factors, the data was obtained from the Ministry of Finance and Economic Development of Ethiopia (MoFED).

B. Sampling Design

The study includes all banks operating in Ethiopia as a population of the study. However, to nullify the short-term performance business, financial statements of twelve years of data were considered. Banks that operate less than twelve years were not taken into consideration since those others have no data for twelve years. Among the population of 19 commercial banks operating in Ethiopia, by using purposive sampling technique for this study select eight banks, namely, commercial bank of Ethiopia, Dashen bank, Awash international bank, Bank of Abyssinia, Wegagen bank, United bank, Nib international bank and Cooperative Bank of Oromia that were registered by NBE before 2007/08. Among these eight banks, one bank, namely, the commercial bank of Ethiopia, is a state-owned bank. Consequently, the study use panel data of eight commercial banks for twelve years with 96 observations.

C. Method of Data Analysis

Based on the objectives of this study, descriptive statistics, econometric, and the Altman Z model were employed to analyze the collected panel data. The statistical package 'REVIEW 9' software was employed in order to achieve the objectives of the study.

1) Model Specification for Factors Affecting Banks Performance: The empirical evidence on the determinants of Ethiopian commercial banks' performance is studied based on balanced panel data, where all the variables are observed for each cross-section and each time period. This study used Return on Equity (ROE) and Return on Asset (ROA) as dependent variables as a proxy for banks' performance while Operating cost, Capital adequacy, Earning ability, Bank size, Exchange rate, and GDP per capital used as an explanatory variable. A multiple regressions model was used to determine the most significant and influential explanatory variables affecting the performance of banks in Ethiopia. The model is described by the following equation:

$$Y_{it} = \alpha + \beta X_{it} + \varepsilon_{it}$$

Where

Y_{it} = is the dependent variable I in year t

α = is the intercept term

β = is parameters to be estimated on the explanatory variables

X_{it} = is the explanatory variables

ε_{it} = the normal error term.

2) Model Specification for Prediction of Default - Altman Z Score Model: Altman's Z developed a model in 1968 to predict business insolvency of publically traded companies, which is also known as the Z score model. The initial model developed in 1968 was further revised to apply it to non-manufacturing businesses and emerging markets. Later, Altman slightly amended his model and developed a new Z score model, which can be applied to non-manufacturing firms, including financial institutions as well. Accordingly, the new Z"-Score model is:

Z" = 6.56X1+ 3.26X2 + 6.72X3 + 1.05X4

Where:

X1= Working capital / total assets,

X2= Net operating profit / total assets,

X3= EBIT / total assets (where EBIT is earnings before interest and taxes),

X4= BVE / total debt (where BVE is the book value of equity and total debt is the book value of total liabilities)

Source: [1].

Altman's Z score analysis has been applied by financial analysts to evaluate the general trend in the financial health of the enterprises over a period by applying Multiple Discriminate Analysis (MDA). Altman's Z combined key financial ratios into a single measure Zeta score analysis with the help of Multiple Discriminate Analysis (MDA). As per the model, Altman stated Z' Score, which is less than 1.10 considered as financially distressed zone (Zone I), and is Z' score is greater than 2.60 as Zone II, which is financially not distressed zone. The result of the Z' Score, which is in between 1.10 to 2.60, is categorized as a "gray area". A "gray area" as defined by [2] is an area where there is no clear line of demarcation between bankruptcy and non-bankruptcy. It is in the deeded undesirable condition of the financial health of the firms.

III. RESULTS AND DISCUSSIONS

This chapter deals with the presentation of results and discussions of the study.

A. Descriptive Statistics Results and Discussion

The total observations for each dependent and explanatory variable were 96 (panel data of 8 commercial banks for 12 years). Table 1 demonstrates the mean, standard deviation, minimum and maximum values for the dependent and independent variables for sample banks over the year 2005 to 2016.

Table 1. Descriptive Statistics Result for Dependent and Independent Variables

	Variable	Observation	Mean	Min.	Max.	Std.Dev.
Dependent variable	Return on asset (ROA)	96	3.060705	1.354500	4.941177	0.731936
	Return on equity (ROE)	96	28.25680	3.543298	77.70970	13.54128
Independent variable	Capital adequacy (CA)	96	12.24803	4.200954	19.21772	3.707850
	Earning ability (EA)	96	61.06804	38.63556	79.77584	9.548287
	Bank size (BS)	96	9.906645	8.110590	11.42765	0.587499
	Operating cost (OC)	96	67.84167	29.42123	99.62859	15.66919
	GDP per capita (GDP)	96	10.71782	7.958071	13.53407	1.500623
	Exchange rate (ER)	96	14.33622	8.651800	22.07990	4.915942

Source: Own's computation based on data obtained from the national bank of Ethiopia

B. Econometric Model Results and Discussions

Prior to the estimation of the econometric model parameters, model diagnostic tests such as multicollinearity, heteroscedasticity, normality, and model specification tests were conducted whether the data fits the basic assumption of the classical linear regression model to ensure that the assumptions of the classical linear regression model are concerned. The multicollinearity, heteroscedasticity, and normality test result show that there are not serious problems with multicollinearity, heteroscedasticity, and normality in the data. To examine whether the fixed or random effect model is appropriate for this study, the Hausman specification test was conducted. The null hypothesis for this test is that the unobservable heterogeneity term is not correlated or random-effect model is appropriate with the independent variables [5].

H0: Random Effects model is appropriate

H1: Fixed Effects model is appropriate

Decision Rule: Reject H0 if p-value less than significance level 5%, otherwise accept Ho.

Table 2. Results of the Test for Correlated Random Effects (Hausman Test)

Variables	Test summary	Chi.sq. statistics	Chi. sq. d.f.	Prob.
ROA	Cross-section random	0.000000	6	1.0000
ROE	Cross-section random	0.000000	6	1.0000

Source: Computed from E-views 9 result

The Hausman test result in Table 2 shows that the P-values of ROA and ROE models were 1.0000, which are more than 5% level of significance. This was implying that the random effect model is more appropriate than the fixed-effect model. Therefore, the study adopts random effects model in order to examine determinants of bank financial performance.

1) Determinants of Return on Assets (ROA):

The adjusted R-squared values (0.481872), F-statistic value (15.72537), and Prob (F-statistic) value (0.000000) result reported in Table 3 below indicate that the overall model is fit well for this study. Among six independent variables used for analysis, four variables that Capital adequacy (CA), Earning ability (EA), Operating cost (OC), and Exchange rate (ER), significantly affect the return on assets in commercial banks during the study period of time. The result of the model (Table 3) is discussed below in detail.

Table 3. Result for Linear Regression Analysis Using ROA as a Proxy of Financial Performance

Variables	Coefficient	Std. error	t-statistic	Prob.
_cons	6.965108	1.912962	3.641008	0.0005
Capital adequacy (CA)	0.057906	0.016203	3.573722	**0.0006*** **
Earning ability (EA)	-0.031611	0.004865	-6.497724	**0.0001*** **
Bank size (BS)	-0.108867	0.157641	-0.690599	0.4916
Operating cost (OC)	-0.030567	0.015551	-1.965673	**0.0525***
GDP per capital (GDP)	0.027720	0.036677	0.755767	0.4518
Exchange rate (ER)	0.030567	0.015551	1.965673	**0.0525***
Weighted Statistics				
R-squared	0.514596	Mean dependent variable		3.060705
Adjusted R-squared	0.481872	S.D. dependent variable		0.731936
S.E. of regression	0.526856	Sum squared residual		24.70438
F-statistic	15.72537	Durbin-Watson statistic		0.645483
Prob(F-statistic)	0.000000			

**** &* statistically significant at 1% and 5% respectively.*
Source: Own's computation based on data obtained from the national bank of Ethiopia

Capital adequacy (CA), which is measured by the equity to asset ratio, was positive and statistically significant at a 1% significance level (p-value=0.0006), and the results (see Table 3) were in line with the hypothesis developed. The result of the study indicates that as capital adequacy increased by one percent, the Return on Asset (ROA) of sampled Ethiopian commercial banks increased by 0.057906 birrs. Moreover, the findings are consistent with previous studies [8].

Earning Ability (EA) measured by interest income to total income is -0.031611, and its P-value is 0.0001. When earning ability increased by one percent, ROA of sampled Ethiopian commercial banks would be decreased by 3.16% and statistically significant at a 1% level of significance. A negative relationship was noticed between EA and ROA, supporting the research hypothesis. This finding is consistent with previous studies to the fact that banks are concentrating more on interest income rather than non-interest income.

Operating cost provides information regarding the efficiency of operating costs relative to total revenue. As we predicted in the hypothesis, the negative relationship between operating cost and ROA was found to be significant at a 5% significance level (p = 0.0525). This (Table 4). The model diagnostic tests result in shows that there is a problem of heteroscedasticity. To solve the problem, they employed robust, which is available in Eview result reveals that when the operating cost of banks increases by 1%, the return on assets decreases by 3.06%, other factors are held constant. This implies that the commercial banks in Ethiopia earn much profit if they are able to exercise efficient cost management practices. The results are consistent with the studies of [4] and [6].

The performance of select commercial banks in Ethiopia is a positive and significant association with the exchange rate and found to be significant at a 5% significance level. When the exchange rate increases by 1%, the ROA increases by 3.05% could be attributed to the fact bank holds more assets in foreign currency in order to gain leverage over exchange rate appreciation. When the currency exchange rate increases, the bank converts assets that are held in foreign currency into local currency and disburse them as a loan in order to earn more interest income.

2) Determinants of Return on Equity (ROE): Among six independent variables used for analysis, three variables that Capital adequacy (CA), Earning ability (EA), and Operating cost (OC), significantly affect the return on equity of commercial banks of Ethiopia earn in a given period of time

9. The result of the model (Table 4) is discussed below in detail

Table 4: Result for Linear Regression Analysis Using ROE as a Proxy of Financial Performance

Variables	Coefficient	Std. error	z-statistic	Prob.
cons	78.66462	21.49723	3.659292	0.0003
Capital adequacy (CA)	-1.440821	0.182087	-7.912799	0.0000***
Earning ability (EA)	-0.161700	0.054671	-2.957709	0.0031***
Bank size (BS)	-0.820910	1.771517	-0.463394	0.6431
Operating cost (OC)	-0.027129	0.043943	-6.173744	0.0000***
GDP per capita (GDP)	-0.043877	0.412169	-0.106454	0.9152
Exchange rate (ER)	0.197082	0.174752	1.127780	0.2594
Robust Statistics				
R-squared	0.518654	Adjusted R-squared		0.486204
Rw-squared	0.793844	Adjust Rw-squared		0.793844
Akaike info criterion	157.7728	Schwarz criterion		176.8449
Deviance	1850.044	Scale		3.573264

**** Statistically significant at 1% respectively*

Source: Own's computation based on data obtained from the national bank of Ethiopia

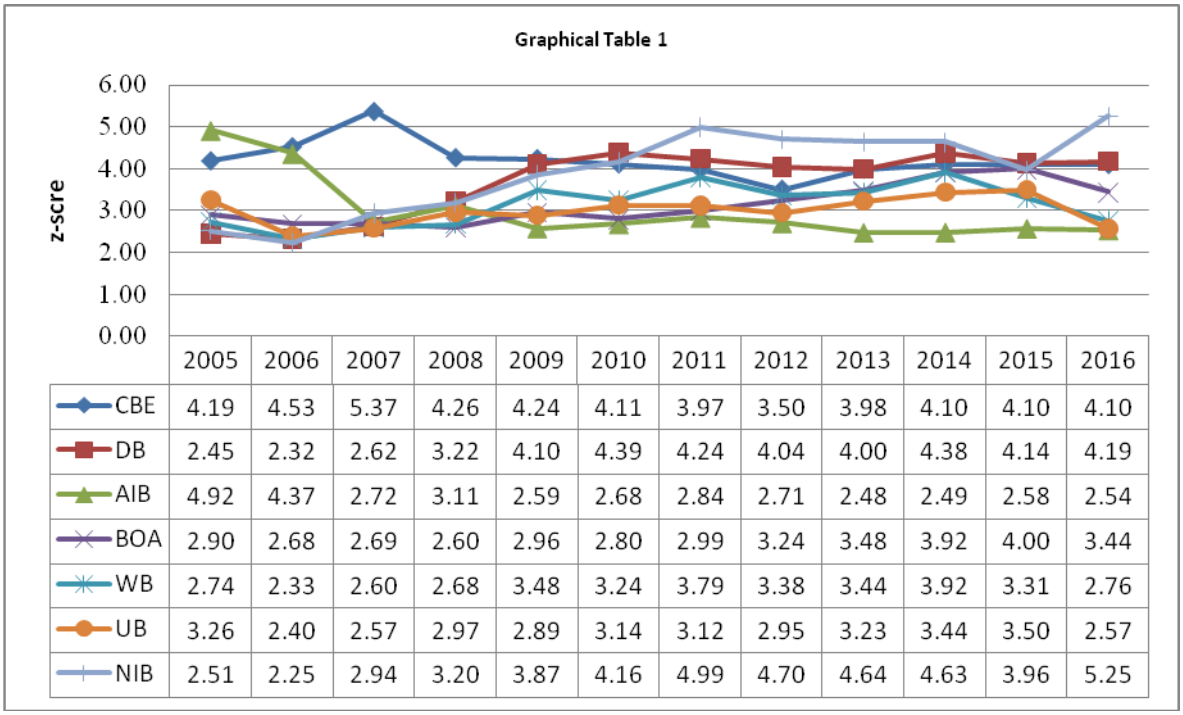
In contrary to the hypothesis, there is a significant negative relationship found between capital Adequacy (CA) and return on equity (ROE) of sampled Ethiopian commercial banks. As per the results of Table 4, When CA increased by one percent, ROE decreased by 1.440821 birrs and which is statistically significant at 1% of the significance level. The possible reason could be attributed to the fact that banks depend more on customers deposits than shareholder's investment in the share capital of the bank.

The operating cost of banks found a significant negative relationship with ROE at a 1% significance level with a p-value of 0.0000. The results reveal that a decrease in expenses of the bank by 1% increases the profit in terms of Return on Equity by 2.71%. Further in supporting the research hypothesis, if banks could able to exercise efficient cost management practices, they can generate more profits. The result is consistent with the studies of [6] and [4].

When the earning Ability (EA) increased by one percent, the return on equity (ROE) of sampled Ethiopian commercial banks would be decreased by 0.161700 birrs and statistically significant at a 1% level of significance. This finding is consistent with previous studies with [3] attributed to the fact that banks are concentrating more on interest income rather than non-interest income.

3) Default Prediction of banks - Altman Z score Model Results: The Z- score for each sampled commercial bank is discussed (Graphical Table1) below in detail. The results of the study found that there is no serious problem with the financial default of both public and private sector banks.

Graphical 1: Altman's Z Score Result Financial Distress Conditions of Commercial Banks



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
CBE	4.19	4.53	5.37	4.26	4.24	4.11	3.97	3.50	3.98	4.10	4.10	4.10
DB	2.45	2.32	2.62	3.22	4.10	4.39	4.24	4.04	4.00	4.38	4.14	4.19
AIB	4.92	4.37	2.72	3.11	2.59	2.68	2.84	2.71	2.48	2.49	2.58	2.54
BOA	2.90	2.68	2.69	2.60	2.96	2.80	2.99	3.24	3.48	3.92	4.00	3.44
WB	2.74	2.33	2.60	2.68	3.48	3.24	3.79	3.38	3.44	3.92	3.31	2.76
UB	3.26	2.40	2.57	2.97	2.89	3.14	3.12	2.95	3.23	3.44	3.50	2.57
NIB	2.51	2.25	2.94	3.20	3.87	4.16	4.99	4.70	4.64	4.63	3.96	5.25

Source: Own's computation based on data obtained from the national bank of Ethiopia

Based on the Altman Z model results (graphical table 1), it is clear that during the period from 2005 to 2016, being a public sector bank, the Z- score of Commercial Bank of Ethiopia (CBE) is more than 2.60, which indicates that it is in the safe zone. During the period from 2005 to 2006, the Z- score of Dashen bank (DB) is between 1.10 and 2.60 and is in the category of "a gray area," signaling alarming bell. From 2007 to 2016, DB remarkably improved its financial soundness by recording its Z score of more than 2.60. During 2005 and 2012, the Z- score of Awash International Bank (AIB) is more than 2.60, and it is in the safe zone except in 2009, slightly below 2.60, i.e., 2.59. From 2013 onwards, the Z- score of AIB is between 1.10 to 2.60. This may be due to the fact that AIB is adopting an aggressive business strategy in expanding its business operations by opening new branches; as a result, new ones may not cross breakeven immediately. The Z-score of the Bank of Abyssinia (BOA) is above 2.60, which signifies that BOA's financially sound position until the end of the study period. Except in 2006, the Z- score of Wegagen Bank (WB) is more than 2.60, which indicates the bank is in the safe zone.

In the years 2006, 2007and, in 2016, the z- scores of United Bank (UB) are between 1.10 to 2.6, which indicates that fluctuations were noticed, but rest of the period, the bank is quickly recovering and attains a safe zone. The Z-score of Nib International Bank (NIB) during the period 2005 and 2006 is between 1.10 to 2.60 and falls in the category of "a gray area". From the year 2007 to 2016, NIB remarkably improved its financial soundness by recording its Z score of more than 2.60.

VI. CONCLUSION

The major objective of this study is to identify the determinants of financial performance and predict the probability of default in the case of commercial banks in Ethiopia. For the analysis purpose, panel data for eight banks for twelve years was used.

The study findings revealed that there is a significant negative relationship between Capital Adequacy (CA) and Return on Equity (ROE) of sampled Ethiopian commercial banks. When the assets of the banks are more financed by capital in return, the income expected from each birr in the bank's share is decreased. It shows that the Ethiopian banking sector is more dependent on customer deposits than shareholder's investment in the capital of the bank. There is a negative relationship between Earning Ability (EA) and ROA could be attributed to the fact that commercial banks have more concentrated on interest income sources than other income sources, which led to low financial performance (ROA). Further, the operating cost negatively affects the performance of the bank (ROE). The ROA of banks in Ethiopia is positively and significantly associated with the exchange rate.

Further, in this study, Altman's Z score model was adopted to evaluate the current financial distress positions of private commercial banks in Ethiopia. The Z- Score results of the study found that there is no serious problem of financial default of both public and private sector banks.

V. RECOMMENDATIONS

The study findings revealed that the Ethiopian commercial banks were mainly affected by bank-specific factors and had a significant impact on bank performance. It is recommended that banks need to adopt efficient managerial skills and practices to have sustainable development and an edge over their competitors.

Select banks of the study noticed that they are more relying on customers deposit than shareholder's investment in the form of share capital. Due to the nonexistence of the stock market in the country, savings are not properly channelizing into investments, particularly in the form of capital. It is advised that the country needs an active stock market to fasten savings, investment, and income cycle.

The study observed that select Banks depend more on income from fund-based services (interest) by following conventional modes of business. Hence, it is advised that banks should try to generate income on new modes of business by offering fees base services such as credit cards, debit cards, electronic fund transfer services, etc.

Operating cost has a significant negative relationship with the financial performance of banks. If select banks can able to exercise efficient cost management practices by scale up their operations by offering a wide range of customized products such as vehicle loans, educational loans, gold loans, crop loans, warehouse receipt financing, etc., they can strengthen their financial performance.

The financial soundness of the Commercial bank of Ethiopia (CBE) is in a good position, and the probability of financial default is less. The customers and investors can rely on this bank. Since CBE is well established public sector bank, operating its business for so many years, it needs financial reengineering of its products with better services delivery.

On the other hand, private sector banks combat each other for attaining a progressive, stable and sustainable financial position. In the process of quick survival in the competition, select private sector banks are taking more risk, but they have to strike a proper balance between risk and profitability. Otherwise, they may catch in the clutches of financial default.

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REFERENCES

[1] Altman, E., Hartzell, J. and Peck, M., Emerging Markets Corporate Bonds: A Scoring System. New York: Wiley and Sons, (1995).

[2] Altman, E. I., Predicting financial distress of companies: revisiting Z-score and ZETA models. Stern School of Business, New York University, (2000) 9-12.

[3] Belayneh, H ., Determinants of Commercial Banks profitability of Ethiopian Commercial banks, Msc thesis, School of Business and Public Administration, Ababa University, (2011).

[4] Birhanu, Ts., Determinants of Commercial Banks Profitability of Commercial Banks in Ethiopia, Msc thesis, Addis Ababa University, (2012).

[5] Brooks, Ch., Introductory Econometrics for Finance, 2nd edition, Cambridge University, New work, (2008).

[6] Ghazouani, I and Moussa, S., Explanatory Factors of Bank performance', Evidence from Tunisia, International Journal of Economics, Finance and Management, 2(1) (2013).

[7] Kosmidou, K and Zopounidis, C ., Measurement of Bank Performance in Greece, South-Eastern Europe Journal of Economics , 1(2008) 79-95.

[8] Samuel O.F., Banking sector Liquidity and Financial Crises in Nigeria: International Journal of Economics and Finance, 3(5) (2011) 3-11.

[9] Sufian, F., Profitability of The Korean Banking Sector, Panel Evidence on Bank Specific and Macroeconomic Determinants, Journal of Economics and m Management, 7(1) (2011) 43-72.