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A Study Of The Effect Of Diversity In The Board And The Audit Committee Composition On Earnings Management For Low And High Leveraged Banks In Nigeria

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Keywords
Board Diversity, Audit Committee, Earnings Management, Agency Theory.

Jel Classification
J16, M42, G39.

Abstract
The study examines the effect of board diversity and audit committee on earnings management of listed Deposit Money Banks in Nigeria, for low and high leveraged Banks. Earnings Management is measured using Chang, Shen and Fang (2008) model. All the 15 banks listed in Nigerian Stock Exchange as at 2015 were used for the analysis. Data were obtained from the financial statements covering the period 2008-2015. Multiple regression technique was employed, while the tool of analysis is Stata 13. The findings revealed that, all the variables have significant effect on earnings management of banks except for women directors and board size under the low leveraged banks, while board ownership was also found to have weak impact on earnings management under the high leveraged banks. Meanwhile, the findings also revealed that the explanatory variables under the low explained earnings management better than high leveraged.

1.1 Introduction

Earnings management has dominated the literature of accounting since the witness of the financial scandals around the world by various institutions most especially Enron Corporation, Tyco, A.P., Xerox, HealthSouth and WorldCom in the U.S, Adelphia Communication Corporation in Pennsylvania, Parmalat in Italy and Cardbury in Nigeria among others have drawn the attention of many among practitioners, the regulators, researchers and other stakeholders to finding the possible solution in corporate businesses.

Earnings management practice has been increasing in recent years in the Nigerian banking industry to attract unsuspecting investors, or obtain undeserved accounting-based rewards by presenting an exaggerated misleading or deceptive state of bank financial affairs, such as the case of Oceanic Bank Plc and Intercontinental Bank Plc.

Board Diversity is seen as the variation of the age, race, ethnicity, gender, and social/cultural identities among employees within a specific corporation (Marimuthu, 2008). Board diversity in respect of board gender, board ownership, board nationality, board size, board composition and audit committee have drawn scholar's attention in recent times due to its effect on earnings management.

Furthermore, an audit committee has been identified as core to financial reporting quality. The Board is expected to establish audit committees which comprise of six members both from non-executive and outside members (shareholders). Also, the corporate governance code for banks require them to meet at least four times in a year wherein they are expected to improve the quality of financial reporting and hence reduce level of opportunistic behaviours by managers (Hassan & Farouk, 2014). Meanwhile, the basic function of audit committees are to oversee the financial reporting process, monitor managers' tendencies to manipulative earnings, increase the audit quality and reduce the questioning of board of directors.

Previous studies in Nigeria and some other developed economies have only looked at the relationship between board diversity and earnings management without taking into cognizant the characteristics of the firms and the possibility of the firms acting differently in certain given condition. Scholars such as Bartov (1993) and Wasimullah, Toor and

Abbas (2010) argued that financial difficulties provides firms with more motivation to engage in earnings management. Therefore, it is of interest to this study to divide the listed Deposit Money Banks (DMBs) into low leveraged and high leveraged banks to assess the effect of board diversity and audit committee on earnings management.

The decision to focus on the DMBs stems from the fact that the Banks are one of the vibrant sectors that drives the Nigeria economy; there is thus, the need for adequate focus on such sector. Also, the justification for choosing DMBs is premised on the fact that, it is still an area with paucity of studies on this topic particularly in term assessing the banks based on categories.

1.2 Objectives of the Study

The major objective of the study is to examine whether board diversity effect on earnings management differs between low leveraged and high leveraged banks in Nigeria. Based on the objective, the study hypothesized that:

Ho: Board diversity effect on earnings management do not significantly differ between low leveraged and high leveraged banks in Nigeria.

H_1: Board diversity effect on earnings management significantly differ between low leveraged and high leveraged banks in Nigeria

The use of partitioned regression will make the regulators and the investors appreciate the situation under which the managers are more likely to use aggressive earnings management and as such be more vigilant and watchful against the managers to avoid such happening in the organization.

2.0 Literature Review

This section discuss the concepts such as board diversity and earnings management used in the study. The section further review empirical literatures in relation to the variables being examined, while the section end with discussion of theories which underpin the variables. .

2.1 Earnings Management

Earnings management have been defined by various scholars. However there is no consensus on the best definition of the concept. According to Rahman, Mohammad and Jamil (2013), earnings management may be defined as reasonable and legal management

decision making and reporting intended to achieve stable and predictable financial results. In similar vein, Schipper (1989) defined earnings management as the process of taking deliberate steps within the constraints of Generally Accepted Accounting Principles to bring about a desired level of reported income. Also, Naser (1993) defines creative accounting as the transformation of financial accounting figures from what they actually are to what preparers' desire by taking advantage of the existing rules and or ignoring some or all of them. These definitions sees earnings management as legal and reasonable decision taken by management since it does not alter any accounting principles.

2.3 Board Diversity

Diversity means having a range of many people that are different from each other. There is, however, no uniform definition of board diversity. Traditionally speaking, one can consider factors like age, race, gender, educational background and professional qualifications of the directors to make the board less homogenous. Van der Walt and Ingley (2003) define diversity in the composition of the Board as the varied combination of attributes, characteristics and skills that their members have.

2.4 Review of Empirical Studies

Psychology and management literature have long acknowledged that significant gender-based differences exist, for instance, in leadership styles, communicative skills, conservatism, risk averseness, and decision-making. Given these differences and their potential implications for corporate governance, the issue of gender diversity has begun to receive increasing attention in corporate finance and corporate governance literature over the past few years. Several studies have recently focused on the effects that female executives and directors may potentially have on the firm's financial performance and market value. This work attempts to extend this literature by addressing the effects of board diversity which include female executives on earnings management.

Eze (2017) used a sample of six (6) firms out of eleven (11) firms in the Nigerian food product firms for a period of twelve years from 2003 to 2014. It was found that board gender has negative but insignificant relationship with earnings management. In a similar study by Firoozi, Magnan and Fortin (2016) using a population of Canadian firms in compustat from 2008 -2012 and a sample of 260 firms. Their findings revealed that board

gender diversity do not have any significant impact on financial reporting quality of firms. Van der Zwet (2015) found that the only significant results in gender diversity, are found with the Modified Jones Model without year and industry dummies. That is, as expected, a negative relationship between the percentage of women and earnings management.

Einer and Soderqvist (2016) and Arun, Almahrog and Aribi (2015) found a negative association between earnings management and female representation on board of director. This implies that the presence of a number of female directors on the board constrains the level of earnings management. A similar study conducted in Nigeria by Omoye and Eriki (2014), they found that board gender has significant negative impact on earnings management and they concluded that when the number of female on board is increased, the earnings management of the firms will decrease.

While the division of control and ownership in corporations is now common in the modern business environment, it also creates a severe conflict of interest between owners and agents. Managers who possess power may have an incentive to use firm resources for their own benefit and expropriate wealth in terms of bonuses or other benefits at the cost of shareholders (Beasley, 1996). The alignment-of-interest hypothesis states that, when managers' ownership stake in a firm increases, it reduces the agency conflict between shareholders and managers (Jensen & Meckling, 1976). This should, in turn, reduce the scope for opportunistic behavior on the part of managers. While the entrenchment hypothesis states that ownership stakes beyond a certain level put managers in a dominant position, which they can use to exploit external minority shareholders (Morck, Shleifer, & Vishny, 1988).

Parveen, Malik, Mahmood and Ali Jan (2016) found that director ownership negatively and significantly influences the tendencies of manipulative activities of the managers while foreign ownership positively and significantly influences the tendencies of manipulative activities of the managers. Swai and Mbogela (2016) using a sample of 44 non-financial East African listed firms for years from 2003 to 2013. The study found that managerial ownership has significant negative effect on real earnings management. Nguyen (2016) documented that firms with higher managerial ownership marginally reduces earnings manipulation in firms subject to considerate debt level and also found that firms with

higher proportion of foreign ownership are more likely to constrain the manipulative practices exercised by managers. Ratnawati, Abdul Hamid and Popoola (2016) shows that managerial ownership affects earnings management practices. Institutional ownership and firm size moderate the relationship between managerial ownership and earnings management. Ramadan (2015) used 77th Jordanian industrial companies listed at Amman Stock Exchange (ASE) for the period 2000-2014 with 1089 firm-year observations. The result shows that management ownership is associated inversely with the practices of earnings management.

As a result of the ongoing globalization, foreign ownership has subsequently become major institutional shareholders in Nigeria and the world at-large (Farouk & Shehu 2014). The role of foreign shareholders as an institutional shareholder has often been categorized by two conflicting views: i. Active monitoring and ii. Transient hypotheses. As posited by the advocates of active monitoring hypothesis, they regard institutional investors as long-term investors with significant incentives to actively oversee managers. It is believed that external monitoring by foreign investors can restrain the opportunistic tendencies by managers for discretionary choices of management in providing financial accounting information, thus, increasing their earnings quality.

Van den Berg (2015) results did not support the hypothesis that firms with more nationality diverse boards of directors have lower levels of earnings management. Abdul Rauf, Johari, Buniamin, and Abd Rahman (2012) used content analysis on the annual report of 214 companies for the year 2008. Their study reveals that board race do not influence the practice of earnings management. A study from Netherland by Hooghiemstra, Hermes, Oxelheim and Randoy (2015) found that foreign director is positively, strongly and significantly influencing earnings management of firms.

Daghsnii, Zouhayer and Mbarek (2016) found that the earnings management is negatively associated with size of the board which suggests that large boards are more effective in monitoring a CEO‘s action. However, the found no effect of the board independence on the earnings management. In another study by Jamaludina, Sanusib and Kamaluddina (2015), they reported a negative but insignificant effect of board size on earnings management for 26 Malaysian listed GLCs from various industries while a significant negative support on

the association between boards of directors' composition towards earnings management is documented. Iraya, Mwangi and Muchoki (2015) used a population of 49 companies trading at the NSE between January 2010 and December 2012. It was documented that earnings management is negatively related to board size. In another study by Fodio, Ibikunle and Oba (2013) board size was found to have negatively and significantly associated with earnings management. Baimukhamedova and Baimukhamedova (2015) found that board composition has significant negative effect on earnings management.

Yasser and Al Mamun (2016) results suggest that audit committee size is positively associated with financial reporting quality. They also noted that, instead of adding value, audit committee independence is negatively associated with reporting quality. Their results indicate that the audit committee is a less significant factor in corporate governance than suggested by many previous researchers and policy makers. Chandrasegaram, Rahimansa, Rahman, Abdullah and Nik Mat (2013) found that audit committee plays a significant role in mitigating earnings management of firms. Ayemere and Elijah (2015) findings confirm that audit committee characteristics have a constraining effect on earnings management. Specifically, audit committee financial expertise, audit committee size, audit committee independence and diligence showed an inverse and significant relationship with earnings management. Xi'an and Xi'an (2012) found that audit committee gender have a negative and significant influence on earnings management of firms. On the other hand, the study conducted by Ioualalen, Khemakhem and Fontaine (2015) using Canadian data with a sample of 10 firms within the period of 1999-2003 found that audit committee diversity does not have any significant impact on earnings management of selected Canadian firms.

This study adopts agency theory due to its relevance in resolving conflict of interest that may arise between managers (agent) and shareholders (principal) of the banks through the use of share held by directors, the number of the board members numbers and its composition.

3.1 Methodology

The study adopts the ex-post facto research design. Quantitative and deductive approach is employed and the study align itself with positivism paradigm. The study covers all the

15 DMBs listed on the Nigerian Stock Exchange as at 31st December, 2008 and remain listed up till 2015. Secondary source of data was used and were extracted from the Published Audited Annual Reports and Accounts of the Banks. Multiple Regression Technique was adopted for the study. In addition, partitioned regression was carried out by categorizing the listed deposit money banks into two categories which are high leveraged Banks and low leveraged Banks. The mean of the banks' leverage was used as a basis of the D into low leveraged and high leveraged. The average mean was 0.86325 (see Appendix). Therefore, any bank whose leverage is 0.86 and above is categorized as high leveraged banks and those banks whose leverage is below 0.86 is considered as low leveraged banks. Stata 13 was used as tool of data analysis. Robustness tests such as multicolinearity test, normality test, heteroscedasticity test, hausman specification test, langrarian multiplier test were conducted. The study uses Chang, Shen and Fang (2008) model of discretionary loan loss provision in the first model. The residual of which was used to represent earnings management in the second model.

$$DLLP_i / TA_{t-1} = LLP_{it}/TA_{t-1} - \{\alpha_0\, 1/TA_{t-1} + \alpha_1\, LCO_i/TA_{t-1} + \alpha_2\, BBAL_i/TA_{t-1}\} \ldots (i)$$

$$EM_{it} = \beta_{0it} + \beta_1 Wdir_{it} + \beta_2 Bown_{it} + \beta_3 Fdir_{it} + \beta_4 Bsize_{it} + \beta_5 Bodc_{it} + \beta_6 Acc_{it} + \mu_{it} \ldots (ii)$$

In the first model, DLLP = Discretionary loan loss provision, LLP_{it} = Loan loss provision, LCO_i = Loan Charge-off, BBAL = Beginning Balance of loan loss, TA_{t-1} = Lagged Total Assets, α_0 = Constant. In the second model, EM_{it} = Earnings Management, $Wdir_{it}$ = Women Director is measured as Number of women on board over the total number of board members (Bathula, 2008), $Bown_{it}$ = Board Ownership measured is Ratio of shares held by directors divided by total shares in issue (Farouk, 2014), $Fdir_{it}$ = Foreign Director is measured as the number of foreign directors on board divided by total number of board members (Abdul Rauf, Johari, Buniamin, & Abd Rahman, 2012), $Bsize_{it}$ = Board Size is measured as the number of board members in a particular year (Daghsnii, Zouhayer & Mbarek, 2016), $Bodc_{it}$ = Board Composition is measured as ratio of non-executive directors to the total

number of directors on board (Arabborzoo, Rashidpuran & Arabi, 2015), Acc_{it} = Audit Committee is measured as the average of audit committee which include number of audit committee size, the composition of audit committee and the number of meetings held was used, β_1-β_6 = Coefficient of explanatory variables, β_o = Constant or Intercept, μ = Error Term, *it* = Companies and Time

4.1 Results and Discussion

This section present, analyses, discusses and make comparison between low leveraged banks and high leveraged banks in relation to board diversity, audit committee effect on earnings management.

Table 4.5 Summary of Random Effect Model

	Low Leveraged			**High Leveraged**		
Variables	**Coeffi**	**Z-Stat**	**Prob**	**Coeffi**	**Z-Stat**	**Prob**
Constant	0.266	4.45	0.000*	0.084	3.83	0.000*
Wdir	-0.010	-1.04	0.297	-0.015	-2.61	0.009*
Bown	0.029	3.18	0.001*	0.004	1.33	0.184
Fdir	0.065	3.62	0.000*	0.007	1.91	0.056***
Bsize	-0.001	-1.08	0.282	-0.001	-1.66	0.096***
Bodc	-0.047	-1.65	0.098***	-0.019	-2.34	0.019**
Acc	-0.023	4.34	0.000*	-0.004	-1.93	0.054***
R^2 Within	0.5698			0.6336		
R^2 Between	0.4060			0.5442		
R^2 Overall	0.4046			0.3894		
Wald Chi^2	44.07			80.92		
Prob.	0.0000			0.0000		

Result output from Stata 13

*, **, *** indicate 1%, 5% and 10% significant level respectively

The cumulative R^2 overall of 0.4046 and 0.3894 for low leveraged and high leveraged banks shows the that 40.46% and 38.94% of variation in the earnings management of listed DMBs are explained by its women director, board ownership, foreign director, board size, board composition and audit committee jointly.

The Wald Chi^2 values of 44.07 and 80.92 for low leveraged and high leveraged models which are significant at one percent respectively indicates the fitness of the models. This however implies that, for any change in board diversity and audit committee variables; the earnings management of listed Banks is directly affected. The Probability values of Wald chi^2 which were significant at a level of 1% for both models indicate that there is a 99.9% probability that the relationship among the variables cannot be due to mere occurrence which in addition connote that the independent variables of the study reliably predict the dependent variable.

i. Women director and Earnings Management

From the Table 4.5a, it was observed that the z-value for women director is -1.04 for low leveraged banks and -2.61 for high leveraged banks, while the coefficient for both models in respect of women director is -0.010 and -0.015 respectively with significant value of 0.297 and 0.009 respectively. This shows that women director has negative but insignificant effect on earnings management of low leveraged banks, while for high leveraged banks, significant negative effect of women director on earnings management is documented.

ii. Board Ownership and Earnings Management

The regression results for low leveraged banks revealed that board ownership has positive and significant effect on earnings management. This is shown in Table 4.5a as the z-value is 3.18 and a coefficient value of 0.029 which is significant at 1%. However, for the high leveraged banks, board ownership recorded a z-value of 1.33 and a coefficient value of 0.004 which is neither significant at 1%, 5% nor 10% level. These implies that board ownership has an insignificant positive effect on earnings management of Banks.

iii. Foreign Director and Earnings Management

Foreign director variable for low leveraged and high leveraged banks model has a z-value of 3.62 and 1.91, and a coefficient value of 0.065 and 0.007 respectively and model one is

significant at 1%, but significant at 10% in the second model. This shows that foreign director has significant positive effect on earnings management of banks for both low and high leveraged banks in Nigeria.

iv. Board Size and Earnings Management

The result in respect of board size for both low and high leveraged banks recorded a z-values of -1.08 and -1.66, and a coefficient values of -0.001 and -0.001 respectively; of which only model was significant at 10% level. This indicates that board size has negative but significant effect on earnings management in high leveraged banks in Nigeria.

v. Board Composition and Earnings Management

From the Table 4.5a above, the z-value for board composition is -1.65 for low leveraged banks and -2.34 for high leveraged banks, while the coefficient for both models in respect of board composition is -0.047 and -0.019 respectively. Both were significant at 10% and 5% respectively. This signifies that board composition has significant negative effect on earnings management of low and high leveraged banks in Nigeria.

vi. Audit Committee and Earnings Management

In low leveraged banks, audit committee recorded a z-values of -4.34 and -1.93 for high leveraged banks, while the coefficient for both models in respect of audit committee is -0.023 and -0.004 with a significant value of 1% and 5% respectively. This signifies that audit committee has significant negative effect on earnings management of low and high leveraged banks in Nigeria

Comparison between the low leveraged and high leveraged Banks in Nigeria

On the overall, when the R2 of the two categories of banks are compared for both low leveraged banks and high leveraged banks, board diversity for low leveraged banks have more significant effect on earnings management than that of the high leveraged banks. This can be substantiated by the R^2 of 0.4046 for low leveraged banks and 0.3894 for high leveraged banks from the two models. The differences in the R^2 between low leveraged and high leveraged banks is 1.52%.

Further, comparing this two models, the probability values for the two categories of banks showcase that explanatory variables (women director, board ownership, foreign director, board size, board composition and audit committee) of low leveraged banks significantly

explain the variation in the level of earnings management better than that of the high leveraged banks.

Consequently, comparing the two results from the models, looking at the direction of the coefficients, the level of significance of the coefficients, the magnitude of the coefficients, the coefficient of determination and their fisher exact test clearly show that there was significant difference between the low and high leveraged banks. This results however provide an evidence of rejecting null hypothesis which state that board diversity and audit committee effect on earnings management do not significantly differ between the low leveraged and high leveraged banks in Nigeria.

Finally, the findings shed more light on board diversity, audit committee and earnings management studies in the sense that earnings management practices mitigations using board diversity and audit committee varies across banks most especially when they are categorized under the low leveraged and high leveraged banks.

5.1 Conclusions

The aim of the study is to examine whether the effects of board diversity on earnings management differ between low leveraged and high leveraged banks in Nigeria. Fifteen (15) banks were studied using quantitative approach within the positivism paradigm. Data were sourced from financial statements and partitioned regression was carried out between high leveraged and low leveraged banks. We conclude that managerial attitude towards earnings manipulations are same in either situation. This indicates that risk profile and debt structure and possible covenants pressures do not derive opportunistic behavior of managers. Earning manipulations in these banks could be considered to be triggered by ex post efficiency concerns, managerial job security motives and the need to sustenance shareholder confidence and prospective investors. The result of this study is limited to bank leverage classification based on partitioning regression analysis and may not be applicable to other non-bank financial firms and non-financial firms in Nigeria. Also, different bank leverage categorization or stratification may also yield different results and this may be an avenue for future studies.

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Appendix

```
. xtset id year, yearly
       panel variable:  id (strongly balanced)
        time variable:  year, 2008 to 2015
                delta:  1 year

. su em wdir bown fdir bsize bodc acc wdirac bownac, detail
```

em

Percentiles		Smallest		
1%	.00003	.00003		
5%	.00004	.00003		
10%	.000085	.00004	Obs	120
25%	.00014	.00004	Sum of Wgt.	120
50%	.0003		Mean	.0070152
		Largest	Std. Dev.	.0249345
75%	.001	.09301		
90%	.00436	.14148	Variance	.0006217
95%	.041295	.14359	Skewness	4.587297
99%	.14359	.14507	Kurtosis	24.12794

wdir

Percentiles		Smallest		
1%	0	0		
5%	0	0		
10%	0	0	Obs	120
25%	.065	0	Sum of Wgt.	120
50%	.14		Mean	.1376667
		Largest	Std. Dev.	.1102841
75%	.2	.37		
90%	.26	.42	Variance	.0121626
95%	.285	.58	Skewness	1.188963
99%	.58	.6	Kurtosis	6.16595

bown

Percentiles		Smallest		
1%	1.02	1.02		
5%	1.02	1.02		
10%	1.06	1.02	Obs	120
25%	1.395	1.02	Sum of Wgt.	120
50%	3.895		Mean	9.321667
		Largest	Std. Dev.	11.75837
75%	11.775	42.74		
90%	29.57	43.94	Variance	138.2594
95%	35.62	49.93	Skewness	1.825749
99%	49.93	55.19	Kurtosis	5.846214

Fdir

Percentiles		Smallest		
1%	0	0		
5%	0	0		
10%	0	0	Obs	120
25%	0	0	Sum of Wgt.	120
50%	0		Mean	.1008148
		Largest	Std. Dev.	.1384829
75%	.165	.43		
90%	.355	.45	Variance	.0191775
95%	.395	.46	Skewness	1.209669
99%	.46	.5	Kurtosis	3.235546

bsize

Percentiles		Smallest		
1%	8	8		
5%	11	8		
10%	11.5	9	Obs	120
25%	13	9	Sum of Wgt.	120
50%	15		Mean	14.79167
		Largest	Std. Dev.	2.61828
75%	16	19		
90%	18	20	Variance	6.855392
95%	19	21	Skewness	-.1241366
99%	21	21	Kurtosis	2.962926

bodc

Percentiles		Smallest		
1%	.36	.21		
5%	.42	.36		
10%	.43	.4	Obs	120
25%	.5	.4	Sum of Wgt.	120
50%	.57		Mean	.5699167
		Largest	Std. Dev.	.1128209
75%	.61	.83		
90%	.735	.87	Variance	.0127286
95%	.825	.87	Skewness	.5818536
99%	.87	.88	Kurtosis	4.206201

acc

Percentiles		Smallest		
1%	8.16331	7.16331		
5%	9.471435	8.16331		
10%	10.7407	8.82405	Obs	120
25%	12.1695	9.16331	Sum of Wgt.	120
50%	13.0222		Mean	12.78301
		Largest	Std. Dev.	1.595593
75%	13.53765	15.7509		
90%	14.77595	15.82	Variance	2.545918
95%	15.41245	16.1005	Skewness	-.6560681
99%	16.1005	16.2373	Kurtosis	4.331122

```
. pwcorr em wdir bown fdir bsize bodc acc wdirac bownac, star (0.05) sig
```

	em	wdir	bown	fdir	bsize	bodc	acc
em	1.0000						
wdir	0.0806 0.3815	1.0000					
bown	-0.0461 0.6170	-0.0881 0.3387	1.0000				
fdir	-0.1522 0.0970	0.0237 0.7974	0.0671 0.4668	1.0000			
bsize	-0.1150 0.2112	0.2166* 0.0175	-0.0705 0.4443	-0.1587 0.0834	1.0000		
bodc	-0.0770 0.4032	0.0707 0.4429	-0.0520 0.5724	0.3721* 0.0000	0.1143 0.2138	1.0000	
acc	-0.3963* 0.0000	-0.0967 0.2934	-0.1162 0.2063	-0.1743 0.0570	-0.1206 0.1896	0.0690 0.4540	1.0000
wdirac	0.0056 0.9515	0.9821* 0.0000	-0.1048 0.2548	0.0105 0.9090	0.2017* 0.0271	0.0940 0.3073	0.0693 0.4523
bownac	-0.0796 0.3877	-0.0961 0.2967	0.9900* 0.0000	0.0568 0.5379	-0.0901 0.3277	-0.0457 0.6201	-0.0163 0.8593

	wdirac	bownac
wdirac	1.0000	
bownac	-0.0946 0.3041	1.0000

Descriptive Statistics for Leverage to ascertain high and low leveraged Banks

```
. su lev, detail
```

lev

Percentiles		Smallest		
1%	.72	.71		
5%	.75	.72		
10%	.79	.72	Obs	120
25%	.82	.73	Sum of Wgt.	120
50%	.86		Mean	.86325
		Largest	Std. Dev.	.0863855
75%	.89	1.13		
90%	.92	1.16	Variance	.0074625
95%	.96	1.28	Skewness	2.528072
99%	1.28	1.32	Kurtosis	13.71162

```
. xtset id year, yearly
       panel variable:  id (unbalanced)
        time variable:  year, 2008 to 2015, but with a gap
                delta:  1 year

. reg em wdir bown fdir bsize bodc acc
```

Source	SS	df	MS	Number of obs	= 54
				F(6, 47)	= 5.67
Model	.020113182	6	.003352197	Prob > F	= 0.0002
Residual	.027771524	47	.000590883	R-squared	= 0.4200
				Adj R-squared	= 0.3460
Total	.047884706	53	.000903485	Root MSE	= .02431

em	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
wdir	-.0028637	.0094504	-0.30	0.763	-.0218754	.0161481
bown	.0312839	.0095263	3.28	0.002	.0121194	.0504483
fdir	.061976	.0178423	3.47	0.001	.026082	.09787
bsize	-.0009763	.0018525	-0.53	0.601	-.004703	.0027504
bodc	-.0489547	.0326245	-1.50	0.140	-.1145867	.0166774
acc	-.0232623	.0051765	-4.49	0.000	-.033676	-.0128486
_cons	.2498644	.0677772	3.69	0.001	.1135143	.3862144

```
. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of em

         chi2(1)      =    94.84
         Prob > chi2  =   0.0000
```

```
. vif
```

Variable	VIF	1/VIF
acc	6.20	0.161284
fdir	5.32	0.188048
bown	1.96	0.510301
wdir	1.94	0.515541
bsize	1.70	0.587006
bodc	1.35	0.739400
Mean VIF	3.08	

```
. xtreg em wdir bown fdir bsize bodc acc, fe

Fixed-effects (within) regression               Number of obs      =        54
Group variable: id                              Number of groups   =        12

R-sq:  within  = 0.5803                         Obs per group: min =         1
       between = 0.4094                                        avg =       4.5
       overall = 0.3977                                        max =         8

                                                F(6,36)            =      8.30
corr(u_i, Xb)  = -0.4841                        Prob > F           =    0.0000
```

em	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
wdir	-.0085138	.0140114	-0.61	0.547	-.0369301	.0199026
bown	.0386026	.0118311	3.26	0.002	.0146081	.0625972
fdir	.0797245	.024039	3.32	0.002	.0309711	.1284779
bsize	-.0030054	.0019743	-1.52	0.137	-.0070095	.0009987
bodc	-.0580628	.0294813	-1.97	0.057	-.1178536	.001728
acc	-.0314362	.0075607	-4.16	0.000	-.04677	-.0161024
_cons	.36877	.0720975	5.11	0.000	.2225494	.5149906
sigma_u	.02869325					
sigma_e	.01870081					
rho	.70186405	(fraction of variance due to u_i)				

```
F test that all u_i=0:     F(11, 36) =     3.95                 Prob > F = 0.0008

. est store fixed
```

```
. xtreg em wdir bown fdir bsize bodc acc, re

Random-effects GLS regression                   Number of obs      =        54
Group variable: id                              Number of groups   =        12

R-sq:  within  = 0.5698                         Obs per group: min =         1
       between = 0.4060                                        avg =       4.5
       overall = 0.4046                                        max =         8

                                                Wald chi2(6)       =     44.07
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000
```

em	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
wdir	-.0104255	.0099957	-1.04	0.297	-.0300167	.0091656
bown	.0289526	.0091038	3.18	0.001	.0111095	.0467957
fdir	.0656597	.0181372	3.62	0.000	.0301114	.101208
bsize	-.0018334	.0017043	-1.08	0.282	-.0051738	.001507
bodc	-.047007	.0284477	-1.65	0.098	-.1027635	.0087494
acc	-.0230035	.0053016	-4.34	0.000	-.0333945	-.0126126
_cons	.2659414	.0598259	4.45	0.000	.1486849	.3831979
sigma_u	.01689716					
sigma_e	.01870081					
rho	.44946245	(fraction of variance due to u_i)				

```
. est store random

. hausman fixed random
```

	Coefficients (b) fixed	(B) random	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
wdir	-.0085138	-.0104255	.0019118	.0098186
bown	.0386026	.0289526	.00965	.0075562
fdir	.0797245	.0656597	.0140648	.0157771
bsize	-.0030054	-.0018334	-.001172	.0009966
bodc	-.0580628	-.047007	-.0110558	.0077379
acc	-.0314362	-.0230035	-.0084327	.0053905

```
                b = consistent under Ho and Ha; obtained from xtreg
     B = inconsistent under Ha, efficient under Ho; obtained from xtreg

 Test:  Ho:  difference in coefficients not systematic

              chi2(6) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                      =        7.24
            Prob>chi2 =      0.2995
            (V_b-V_B is not positive definite)
```

```
. xttest0

Breusch and Pagan Lagrangian multiplier test for random effects

        em[id,t] = Xb + u[id] + e[id,t]

        Estimated results:
                         |       Var     sd = sqrt(Var)
                ---------+------------------------------
                      em |    .0009035        .030058
                       e |    .0003497       .0187008
                       u |    .0002855       .0168972

        Test:   Var(u) = 0
                                 chibar2(01) =    14.43
                              Prob > chibar2 =   0.0001
```

Regression Output for the High Leveraged Banks

```
. xtset id year, yearly
       panel variable:  id (unbalanced)
        time variable:  year, 2008 to 2015, but with gaps
                delta:  1 year

. reg em wdir bown fdir bsize bodc acc

      Source |       SS       df       MS              Number of obs =      66
-------------+------------------------------           F(  6,    59) =    7.85
       Model |  .011373506     6  .001895584           Prob > F      =  0.0000
    Residual |  .014249046    59  .000241509           R-squared     =  0.4439
-------------+------------------------------           Adj R-squared =  0.3873
       Total |  .025622552    65  .000394193           Root MSE      =  .01554

------------------------------------------------------------------------------
          em |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        wdir |  -.0122381   .0065391    -1.87   0.066    -.0253229    .0008467
        bown |   .0102412   .0051492     1.99   0.051    -.0000622    .0205447
        fdir |   .0194637   .0052133     3.73   0.000      .009032    .0298955
       bsize |  -.0015072   .0006813    -2.21   0.031    -.0028705   -.0001439
        bodc |  -.0423498    .018623    -2.27   0.027    -.0796144   -.0050853
         acc |  -.0081276   .0023618    -3.44   0.001    -.0128536   -.0034016
       _cons |   .1309091   .0261226     5.01   0.000     .0786379    .1831803
------------------------------------------------------------------------------

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of em

         chi2(1)      =   173.25
         Prob > chi2  =   0.0000
```

```
. vif
```

Variable	VIF	1/VIF
acc	3.83	0.260989
bown	2.31	0.433126
wdir	1.95	0.512042
fdir	1.47	0.678801
bsize	1.25	0.799932
bodc	1.13	0.886824
Mean VIF	1.99	

```
. xtreg em wdir bown fdir bsize bodc acc, fe

Fixed-effects (within) regression               Number of obs      =        66
Group variable: id                              Number of groups   =        13

R-sq:  within  = 0.6353                         Obs per group: min =         1
       between = 0.4972                                        avg =       5.1
       overall = 0.3637                                        max =         8

                                                F(6,47)            =     13.65
corr(u_i, Xb)  = 0.1462                         Prob > F           =    0.0000
```

em	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
wdir	-.0164721	.0056425	-2.92	0.005	-.0278233	-.0051209
bown	.0029708	.0031307	0.95	0.348	-.0033273	.0092689
fdir	.0057433	.0040244	1.43	0.160	-.0023527	.0138394
bsize	-.0004608	.0003093	-1.49	0.143	-.0010831	.0001614
bodc	-.016719	.0078943	-2.12	0.040	-.0326003	-.0008378
acc	-.0034149	.0022439	-1.52	0.135	-.0079292	.0010993
_cons	.0682449	.0201211	3.39	0.001	.0277665	.1087233
sigma_u	.03359168					
sigma_e	.00468515					
rho	.98091832	(fraction of variance due to u_i)				

```
F test that all u_i=0:     F(12, 47) =    50.18                 Prob > F = 0.0000

. est store fixed
```

```
. xtreg em wdir bown fdir bsize bodc acc, re

Random-effects GLS regression                   Number of obs      =        66
Group variable: id                              Number of groups   =        13

R-sq:  within  = 0.6336                         Obs per group: min =         1
       between = 0.5442                                        avg =       5.1
       overall = 0.3894                                        max =         8

                                                Wald chi2(6)       =     80.92
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000
```

em	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
wdir	-.0149993	.0057413	-2.61	0.009	-.0262521	-.0037466
bown	.004255	.003206	1.33	0.184	-.0020287	.0105387
fdir	.0078331	.0040987	1.91	0.056	-.0002002	.0158664
bsize	-.0005377	.0003229	-1.66	0.096	-.0011706	.0000953
bodc	-.0193468	.0082547	-2.34	0.019	-.0355256	-.0031679
acc	-.0043961	.0022826	-1.93	0.054	-.0088698	.0000777
_cons	.0840853	.0219828	3.83	0.000	.0409999	.1271708
sigma_u	.02620423					
sigma_e	.00468515					
rho	.96902307	(fraction of variance due to u_i)				

```
. est store random

. hausman fixed random
```

	Coefficients (b) fixed	(B) random	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
wdir	-.0164721	-.0149993	-.0014727	.
bown	.0029708	.004255	-.0012842	.
fdir	.0057433	.0078331	-.0020897	.
bsize	-.0004608	-.0005377	.0000769	.
bodc	-.016719	-.0193468	.0026277	.
acc	-.0034149	-.0043961	.0009811	.

```
                b = consistent under Ho and Ha; obtained from xtreg
     B = inconsistent under Ha, efficient under Ho; obtained from xtreg

  Test:  Ho:  difference in coefficients not systematic

              chi2(6) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                      =    -9.18    chi2<0 ==> model fitted on these
                                    data fails to meet the asymptotic
                                    assumptions of the Hausman test;
                                    see suest for a generalized test
```

```
. hausman fixed random, sigmamore
```

	Coefficients (b) fixed	(B) random	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
wdir	-.0164721	-.0149993	-.0014727	.0015916
bown	.0029708	.004255	-.0012842	.0008053
fdir	.0057433	.0078331	-.0020897	.0011214
bsize	-.0004608	-.0005377	.0000769	.0000488
bodc	-.016719	-.0193468	.0026277	.0011581
acc	-.0034149	-.0043961	.0009811	.0006354

b = consistent under Ho and Ha; obtained from xtreg
B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(6) = (b-B)'[(V_b-V_B)^(-1)](b-B)
= 11.48
Prob>chi2 = 0.0746

```
. xttest0

Breusch and Pagan Lagrangian multiplier test for random effects

        em[id,t] = Xb + u[id] + e[id,t]

        Estimated results:
                     |       Var     sd = sqrt(Var)
             ---------+-----------------------------
                  em |   .0003942       .0198543
                   e |    .000022       .0046852
                   u |   .0006867       .0262042

        Test:   Var(u) = 0
                            chibar2(01) =     2.44
                        Prob > chibar2 =   0.0593
```