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Evaluating Institutional Ownership and Financial Performance of Industrial Goods Sector in Nigeria

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Abstract

Evaluating institutional ownership in companies is important to ascertain their effect on the financial performance of companies in Nigeria. Most studies made were conducted abroad and this research filled the gap by investigating companies in the industrial sector of the Nigerian Stock Exchange. The objective of the study was to evaluate ownership structure and its effect on the financial performance of the industrial sector in Nigeria and the hypothesis of the study was that institutional shareholding has no effect on financial performance of industrial sector in Nigeria. The scope of the study was ten years from 2011 to 2015 and secondary data was used for the research. A multiple regression equation was formulated with return on assets as the dependent variable and institutional investors and number of employees as the independent variables. STATA was used to analyse the data. The results revealed that institutional shareholding had no effect on financial performance and employees had a significant effect on financial performance of companies in Nigeria. It was recommended that there should be more presence of institutional shareholding in companies in Nigeria.

Keywords: *Institutional shareholding, Employee, Return on assets*

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Background to the Study

Ownership structures of organizations are concerned with having a claim on the organization. The amount of funds put into the business by the individual or any group guarantee the claim of the business. Ownership structure gives a status of being or entitlements to the business. The ownership structure of the organization can also determine how the general administration of the company is run and what financing policy the organisation adopts. The claim of ownership ranges from the ordinary shareholder to institutions or the institutional shareholder, and such ownership can determine the performance of the organisation because owners of organisations have the sole right to make decisions.

Holdings of institutional investors in companies are expected to have a positive and significant contribution on the growth and success of the organisation. Institutional holdings consist of shares held by large organisations, pension funds or endowments and in many instances the percentage shareholdings of institutional investors is one where significant decisions can be made on the company.The significance of institutional shareholdings are generally to protect, monitor or have control in the company, and in several cases institutional shareholdings have played significantly in determining the financial performances of the organisation.

Berle and Means (1932) proposed the hypothesis that modern corporations are characterised by the separation of ownership and control which led to the literature in the UK and US examining the effects on the significance of ownership and control on financial performance. The relationship could be behavioural because managerial theorists argued that managers pursue their own objectives at the expense of the shareholders or owners (Short, 1994) or it could be otherwise where the owners feel that managers are not acting on the best interest of shareholders. This conflict of interest eventually brought about behavioural thinking of Agency theory. Agency theory as opined by Dalton, Daily, Certo, and Roengpitya (2003) dominated the research on equity holdings and firm performance. Theory has not been able to provide the behavioural aspect of shareholder-manager conflict on financial performance of companies in Nigeria. This study intends to investigate further and fill the gap and update existing literature on ownership structure and financial performance.

When organisations seek for additional funding the two main sources available are debt and equity. Equity contribution comes through paid up share capital, retained earnings or dividends whist debt contribution arises through interest bearing instruments. The contention lies in whether financing using equity is most appropriate or financing with debt. Several companies have given preference on equity over debt financing; which is informed by agency theory, or financing using retained earnings; which is informed by the pecking order theory. Others prefer debt over equity which is informed by the trade-off theory, whilst many use both equity and debt.

Whichever financing policy organisation adopts, it has to take into consideration how the maximum returns can be achieved with the least cost of capital.

Available literature shows that studies on ownership structure and financial performance have not been thoroughly investigated on the industrial sector in Nigeria. Previous studies looked at listed insurance firms (Gugong, Arugu & Dandago (2014): (Xin, 2014) and some selected companies(Uadiale, 2010): with limited research made on the industrial sector in Nigeria. A lot of literature were equally investigated in European countries (Thomson & Pedersen, 2000),

Tunisia (Moussa & Aymen, 2014), Czech Republic (Earnhart & Lizal, 2006), Japan Gedajlovic, Yoshikawa & Hashimoto, 2001 2002) and thus warranting an investigation on Nigerian industrial firms. This study intends to fill this gap and update the literature.

Objectives of the Study

The general objective of the study is to evaluate ownership structure and its effect on the financial performance of industrial sector in Nigeria.

The specific objectives are to:

1. Investigate institutional shareholding on financial performance of industrial sector in Nigeria.
2. Investigate the effect of employees on financial performance of the industrial sector in Nigeria.

Research Questions

In line with the objectives of study, the questions addressed by the study are:

1. To what extent do institutional shareholdings have an effect on the financial performance of industrial sector in Nigeria?
2. Is there a relationship between employee size and financial performance of industrial sector in Nigeria?

Research Hypotheses

The hypotheses formulated for the study are in null form:

H_{01}: Institutional shareholdings have no effect on financial performance of industrial sector in Nigeria.

H_{02}: There is no relationship between employee size and financial performance of industrial sector in Nigeria.

There are many manufacturing companies operating in Nigeria which are owned by the public and private sectors. This study confines the investigation to only the companies quoted on the industrial sector in the Nigerian Stock Exchange. The geographical scope therefore only looks at Nigeria and excludes parent or associated companies operating outside Nigeria. The time scope of the study covers a ten year period from 2011 to 2015 as at 31st December, 2015. Looking at financial performance, several measures have been used to indicate performance, Tobin's *q*, return on assets, market value of shares, and profits. The study intends to look at return on assets as a measure and proxy for financial performance. The paper is sectioned into five parts. The first section looks at the introduction; the second section is the literature review. Section three is the research methodology, while section four is the data presentation and analysis. The concluding section of the paper is in section five.

Literature Review

The industrial sector in Nigeria is an important one. The sector contributes to gross domestic product in the Nigerian economy, generates employment in a globalised economy as identified by Oluranti (2010), and improves the standards of living of the population. The industrialsector thus accounts for a large proportion of economic activity in Nigeria. Adenikinju (1998) looked at the importance from a different perspective of impacting energy consumption on the growth in productivity in Nigeria, and Lean (2008) identified the importance of the sector in attracting foreign direct investment and economic growth.

Adedeye (2016) gave a global perspective by stating that in Asia, remarkable growth was achieved as a result of manufacturing exports and constructive policies aimed at opening markets, implementing favourable trade and exchange rate policies, and attracting foreign direct investment through stable governments and respect for property rights.

In Nigeria, the industrial sector plays a dominant part in the economy. Total market capitalisation of the industrial goods sector in the Nigerian Stock Exchange in 2013 was N3.48 trillion (NSE 2012/2013 Fact book), and currently taking a market share of 20%, next to consumer goods sector with 29% and financial services sector having the largest share of 40% in the mainboard equities market. The industrial sector of the Exchange comprises of companies engaged in the manufacturing and distributing of capital goods. Excluded are aerospace and defence, engineering and building products, electrical equipment, industrial machinery, and packaging products for industrial and consumer products. The production of goods for commercial use dominates this sector.

Available literature on ownership structure and performance of companies is wide. Demsetz and Villalonga (2001) investigated on the relationship between ownership structure and the performance of corporations where the structure was multi-dimensional and treated as an endogenous variable. They found no statistically significant relationship between ownership structure and financial performance and their findings was consistent with the view that a diffused ownership, while it may exacerbate some agency problems, also yielded compensating advantages that generally offset such problems.

Doğan (2013) conducted a research to investigate the effect of firm size on profitability of 200 active companies listed on the Istanbul Stock Exchange. The period of study was between 2008 and 2011. Return on assets was the proxy used for profitability while total assets, total sales and number of employees were indicators of size. Multiple regression and correlation methods were used on the empirical analysis and the result indicated a positive relationship between size and profitability of the firms.

Heydari, Razeghi and Sharifi (2015) also agreed with previous literature on significant relationships of institutional ownership relationships and financial performance where 90 companies on the Tehran Stock Exchange were examined from 2006 to 2010. Dehkalani, Asadi and Kordlouie (2015) on a different view from previous studies conducted examined the effect of institutional ownership on the financial performance of companies quoted in the Bombay Stock Exchange from 2009 to 2013 and their results revealed that there was no significant relationship between institutional ownership with current performance of the companies quoted in the Exchange.

Agency Theory and Ownership Structure

Conflicts in ownership structure and managerial control gave rise to Agency theory. The separation of ownership with management becomes important for businesses because it gives a way forward for organisations to operate. Agency theory explains the behavioural aspect of owners and managers in the organisation. The separation of ownership from management can have its advantages and disadvantages. Agency theory as postulated by Jensen and Mecking (1976) arose due to conflict of interest and the theory has been used by scholars in behavioural management and sociology. Agency theory explains the research on equity holdings - firm performance relationships, and Fooladi (2012) further stated that corporate governance as a mechanism helps to align management's goals with those of the stakeholders that are to increase firm performance.

The kinds of conflicts identified by Jensen and Meckling (1976) are conflicts between shareholders and managers; and conflicts between debt holders and equity holders. Pandey (2010) further explains the kinds of conflicts to be shareholders - debt-holder's conflict, shareholders – managers' conflict, and monitoring and agency costs. The issue at stake is that shareholders can be of the opinion that managers are not acting in the best interest of owners which may affect performance. Shareholders would want to be part of operations of the organisation so as to protect their interests and ensure continued operational performance. Shareholdings owned by institutions are expected to have a positive influence on financial performance because in many instances they have substantial shareholding structure which is expected to improve on operations of the companies.

Researches made on Agency theory include that of Harris and Raviv (1991) and Freeman, Wicks, and Parmar (2004) who informed that stakeholder theory begins with the assumption that values are necessarily and explicitly a part of doing business. Managers are asked to articulate the shared sense of the value they created, and what brings the core stakeholders together. It also pushed managers to be clear about how they wanted to do business, specifically what kinds of relationships they wanted and needed to create with their stakeholders to deliver on their purpose. The underpinning theory for this study is Agency theory where the effect of ownership structure is investigated on financial performance of companies.

Methodology

The research design is quantitative, descriptive and correlational. Data was extracted from secondary sources through the annual report and accounts of the companies, and the Nigerian Stock Exchange 2012/2013 Fact book. STATA was used to analyse the data. The population of the study consisted of 24 companies listed on the manufacturing sector of the Nigerian Stock Exchange over a ten year period from 2011 to 2015.Non probability sampling technique was used for the study so as to extract companies which were delisted from the Exchange during the reference period. Non probability sampling technique provides a range of alternative techniques to select samples, the majority of which include an element of subjective judgement as opined by Saunders, Lewis and Thornhill (2012).20 companies were therefore selected as the sample size representing 83.33% of the population of study. The list of companies used for the research is shown in table 1.

Table 1: Sample of Companies

S/No.	Company
1	African Paints (Nigeria) Plc.
2	Ashaka Cement Plc.
3	Berger Paints Plc.
4	CAP Plc.
5	Cement Co. of North. Nig. Plc.
6	Dangote Cement Plc.
7	DN Meyer Plc.
8	First Aluminium Nigeria Plc.
9	IPWA Plc.
10	Paints and Coatings.
11	Portland Paints & Products Plc.
12	Premier Paints Plc.
13	Lafarge WAPCO Plc.
14	Cutix Plc.
15	Nigerian Wire & Cable Plc.
16	Avon Crowncaps& Containers Plc.
17	Beta Glass Co. Plc.
18	Poly Products (Nig) Plc.
19	Grief Nigeria Plc.
20	Niger Ropes Plc.

Source: The Nigerian Stock Exchange 2012/2013 Fact book.

Model Specification and Variable Measurement

Regression analysis was used in the study to investigate the relationship between institutional ownership and financial performance. A mathematical equation using financial performance as the dependent variable and ownership structure as the independent variable was formulated. The dependent variable is return on assets and the independent variables are institutional shareholding and number of employees. The model used in the study captures the effect of ownership structure on financial performance from the perspective of return on assets and is expressed as follows:

$$ROA = \alpha + \beta_1(LngINST)_{it} + \beta_2(EMP)_{it} + \varepsilon$$

Where,

ROA = return on assets
$INST$ = log of institutional shareholding
EMP = employees
A = constant
$\beta_1 \beta_2$ = coefficients of the regresses
$_i$ = different companies in the sample
ε = error term

The table of variable measurements is shown in table 2 and the a priori expectation of the research shown in table 3.

Table 2: Variable Measurement

Variable	Variable Name	Variable Measurement
Return on Assets	*ROA*	Earnings after tax divided by total assets multiplied by 100
Institutional Shareholding	*INST*	Number of shares of institutional shareholding
Employees	*EMP*	Number of employees

Table 3: A priori expectation of the results

Varible	A Priori Expectation
INST	Positive
EMP	Positive

1. Data Presentation and Analysis of Results

Table 4: Shapiro-Wilk Test

Variable	Obs	Z	Prob>z
ROA	101	9.073	0.00000
INST	101	6.472	0.00000
EMP	101	8.949	0.00000

Source: STATA version 13.0, output generated from secondary data

From the Shapiro Wilk test for normal data of the model shown in table 4, in the 101 observations, the data are normally distributed and eligible for estimate with prob> z values of 0.000. The highest z value was ROA with 9.073 and the least z value was INST with a value of 6.472.

Table 5: Descriptive Statistics

Variable	Obs	Minimum	Maximum	Mean	Std. deviation
ROA	101	0.00005	24536.34	1181.863	4314.204
INST	101	-0.98082	18.80356	12.53888	6.477406
EMP	101	18	12780	722.2376	1985.711

Source: STATA version 13.0, output generated from secondary data

From the descriptive statistics in shown in table 5, in the 101 observations, ROA had the highest average value of 1181.863, EMP had a mean value of 722.2376 and INST had a value of 12.53888. The least minimum value was INST with -0.98082 and the highest minimum value was employees with 18. ROA had a standard deviation of 4314.204. The standard deviation of INST was 6.477.

Table 6: Correlation Matrix

	ROA	INST	EMP
ROA	1.0000		
INST	-0.336425* 0.0006	1.0000	
EMP	0.9669* 0.0000	-0.3649* 0.0002	1.0000

*Correlation is significant at 0.05 levels

Source: STATA version 13.0, output generated from secondary data

From the correlation matrix shown in table 6, all the variables have significant correlations. There is a significant positive correlation between EMP and ROA with a correlation of 96.69% and significant inverse correlations between INST and ROA with a value of -0.3364; and between INST and EMP with a value of -0.3649.

Summary of Regression Results

The summaries of the OLS, fixed and random effects model are shown in tables 7, 8 and 9. The Husman's test analysis yields x_3^2 of 0.00 (see appendix) and p - value of 0.00 less than 0.05 ($p < 0.05$) which is significant at a 5% level, hence there is fixed effect amongst the variables, therefore we take the fixed effect and interpret the results of the fixed effect for the regression model. The fixed effect model is preferred in the presence of correlation as it allows for cross sectional heterogeneity by letting the intercept differ across entities.

Table 7: Regression Model Summary Estimates for OLS

	Coefficients	T	P>[t]
Constant	-504.397		
INST	12.6139	0.69	0.494
EMP	2.1157	35.27	0.000
R^2	0.9353		
Adj R^2	0.9339		
Prob> F	0.0000		
N	101		

Source: STATA version 13.0, output generated from secondary data

From the OLS results 93.39% of the independent variables are explained in the dependent variable indicating that there is a model fit of the variables.

Table 8: Regression Model Summary Estimates for Random Effect

	Coefficients	Z	P>[t]
Constant	-472.32		
INST	10.858	0.55	0.579
EMP	2.104	33.12	0.000
R^2	0.9906		
Prob> Chi2	0.0000		
N	101		

Source: STATA version 13.0, output generated from secondary data

From the Random Effect results the R^2 value is 0.9906, revealing that 99.06% of the independent variables are explained in the dependent variable and a model fit

Table 9: Regression Model Summary Estimates for Fixed Effect

	Coefficients	T	P>[t]
Constant	233.0769		
INST	34 .932	0.16	0.876
EMP	.7072	3.13	0.002
R^2	0.9730		
Adj R^2			
Prob> F	0.0097		
N	101		

Source: STATA version 13.0, output generated from secondary data

From the summary of the fixed effect results, substituting the coefficients into the following equation:

$ROA = \alpha + \beta_1(LngINST)_{it} + \beta_2(EMP)_{it} + \varepsilon$

Reveals the following:

$ROA = 233.0769 + 34.932 LngINST + .707 EMP$

(0.16) (3.13)

The coefficient of the constant is 233.0769. INST is a significant determinant with a beta coefficient of 34.932 indicating that if INST increases by 34.932, ROA will increase by 1%. EMP equally is a significant determinant of ROA with a beta constant coefficient of .707. The R^2 value of 0.9730 shows that 97.30% of the independent variables are explained in the dependent variable and there is a model fit of the variables.

Decision rule

The decision rule is that if $p < 0.05$ and t-value is > 1.96 we reject the null hypothesis, otherwise we fail to reject the null hypothesis

Test of Hypotheses

H_{01}: Institutional shareholdings have no effect on financial performance of industrial sector in Nigeria.

The *p* value for institutional shareholding is 0.876 (0.876 > 0.05) and t-value is 0.16 (0.16 < 1.96). We fail to reject the null hypothesis and conclude that institutional shareholdings have no effect on the financial performance of the industrial sector in Nigeria. This result did not conform to the a priori expectation of the research which was expected to have a positive relationship. The result and did not provide evidence of institutional shareholding having an effect on performance of industrial sector companies in Nigeria. The findings of the research agree with the findings of Dehkalani, Asadi and Kordlouie (2015) who found no significant relationship between institutional investors and financial performance of companies.

H_{02}: There is no relationship between employee size and financial performance of industrial sector in Nigeria.

The *p* value for size of employee is 0.002 (0.002 < 0.05) and t-value is 3.13 (3.13 > 1.96). We reject the null hypothesis and conclude that employee has an effect on the financial

performance of the industrial sector in Nigeria. This result is in conformity with the a priori expectation of the study. The result provides evidence that employee is a determining factor on financial performance of the manufacturing sector in Nigeria. The implication of this result is that industries should continue to maintain the size of its workforce. Once there is adrop in employee size it may likely affect the financial performance of the company. The results conform to the findings of Pervan and Viši (2012) who found significant relationship between firm size and profitability and that of Do an (2013) who foundq positive relationship between size and financial performance of companies active in the Istanbul Stock Exchange.

Conclusion and Recommendations

The study on ownership structure and financial performance of the industrial sector in Nigeria updated the literature as previous studies did not look at quoted companies listed in the industrial sector of the Nigerian Stock Exchange. The contention of institutional shareholding and its relevance on financial performance of companies was investigated which originates from Agency theory because equity and financial performance was best captured in the theory. From the result of findings institutional shareholding has no significant effect on the financial performance of the industrial sector of the Nigerian Stock Exchange. The implication of these findings is that institutional investment has not been contributing to performance and it could be associated with the level of investments made in the companies. There is the need for more institutional investments so that performance of the companies can be improved. The second result on employee and financial performance showed positive and significant effect implying the significance of employees in generating revenue for the companies.

Based on the outcome of the research, the following recommendations are proposed:

1. Institutional investors should be encouraged to increase their investments so that a positive financial performance can be achieved.
2. The industrial sector should continue to maintain the level of employees since there is a significant effect of employees with financial performance. a reduction in number of employees can affect the performance of industries and it is advised that the level of employees to be maintained.

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Notes:
      1.  (/v# option or -set maxvar-) 5000 maximum variables

. edit

. *(5 variables, 101 observations pasted into data editor)

. su roa insti emp, detail

                            ROA
-------------------------------------------------------------
      Percentiles      Smallest
 1%     .0000511       .0000511
 5%      .000125       .0000511
10%      .000389       .0000511       Obs                 101
25%     19.00599        .000125       Sum of Wgt.         101

50%     69.52425                      Mean           1181.863
                        Largest       Std. Dev.      4314.204
75%     252.2321       17685.98
90%     774.0942       19451.34       Variance       1.86e+07
95%     4061.384       22112.56       Skewness        4.30598
99%     22112.56       24536.34       Kurtosis       20.41658

                           INSTI
-------------------------------------------------------------
      Percentiles      Smallest
 1%    -.486133       -.9808292
 5%     .1823216       -.486133
10%     1.229603       -.486133       Obs                 101
25%     9.412287       -.486133       Sum of Wgt.         101

50%     15.91365                      Mean           12.53888
                        Largest       Std. Dev.      6.477406
75%     16.74264       18.80356
90%     17.66483       18.80356       Variance       41.95679
95%     18.55631       18.80356       Skewness      -1.093476
99%     18.80356       18.80356       Kurtosis       2.590534

                            EMP
-------------------------------------------------------------
      Percentiles      Smallest
 1%           18             18
 5%           19             18
10%           32             18       Obs                 101
25%          112             18       Sum of Wgt.         101

50%          170                      Mean           722.2376
                        Largest       Std. Dev.      1985.711
75%          541            8212
90%          775            8212       Variance        3943047
95%          821            8212       Skewness       4.388656
99%         8212           12780       Kurtosis       21.91433
```

```
. swilk roa insti emp

                    Shapiro-Wilk W test for normal data

    Variable |     Obs       W           V         z       Prob>z
-------------+--------------------------------------------------
         roa |     101    0.28418     59.594     9.073     0.00000
       insti |     101    0.77820     18.466     6.472     0.00000
         emp |     101    0.32306     56.357     8.949     0.00000

. pwcorr roa insti emp

             |      roa    insti      emp
-------------+---------------------------
         roa |   1.0000
       insti |  -0.3364   1.0000
         emp |   0.9669  -0.3649   1.0000

. pwcorr roa insti emp, star (0.05) sig

             |      roa    insti      emp
-------------+---------------------------
         roa |   1.0000
             |
             |
       insti |  -0.3364*  1.0000
             |   0.0006
             |
         emp |   0.9669* -0.3649*  1.0000
             |   0.0000   0.0002
             |

. reg roa insti emp

      Source |       SS       df       MS              Number of obs =     101
-------------+------------------------------           F(  2,    98) =  707.82
       Model |  1.7407e+09     2   870364961           Prob > F      =  0.0000
    Residual |   120505598    98  1229648.96           R-squared     =  0.9353
-------------+------------------------------           Adj R-squared =  0.9339
       Total |  1.8612e+09   100  18612355.2           Root MSE      =  1108.9

------------------------------------------------------------------------------
         roa |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       insti |   12.61391   18.38736     0.69   0.494     -23.8752    49.10302
         emp |    2.11578   .0599797    35.27   0.000     1.996752    2.234808
       _cons |  -504.3976   272.9412    -1.85   0.068    -1046.041    37.24534
------------------------------------------------------------------------------

. vif

    Variable |       VIF       1/VIF
-------------+----------------------
         emp |      1.15    0.866843
       insti |      1.15    0.866843
-------------+----------------------
    Mean VIF |      1.15

. hettest

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

         chi2(1)      =   570.79
         Prob > chi2  =   0.0000
```

```
. xtset id yr, year
       panel variable:  id (unbalanced)
        time variable:  yr, 2010 to 2015
                delta:  1 year

. rename yr year

. xtreg roa insti emp, fe

Fixed-effects (within) regression               Number of obs      =       101
Group variable: id                              Number of groups   =        20

R-sq:  within  = 0.1108                         Obs per group: min =         5
       between = 0.9730                                        avg =       5.0
       overall = 0.9171                                        max =         6

                                                F(2,79)            =      4.92
corr(u_i, Xb)  = 0.9487                         Prob > F           =    0.0097

------------------------------------------------------------------------------
         roa |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       insti |   34.93227   222.9079     0.16   0.876    -408.7549    478.6194
         emp |   .7072106    .225685     3.13   0.002     .2579959    1.156425
       _cons |   233.0769   2801.423     0.08   0.934    -5343.016     5809.17
-------------+----------------------------------------------------------------
     sigma_u |  3019.5648
     sigma_e |  925.04351
         rho |  .91420189   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:     F(19, 79) =     3.25                 Prob > F = 0.0001

. xtreg roa insti emp, re

Random-effects GLS regression                   Number of obs      =       101
Group variable: id                              Number of groups   =        20

R-sq:  within  = 0.1106                         Obs per group: min =         5
       between = 0.9906                                        avg =       5.0
       overall = 0.9352                                        max =         6

                                                Wald chi2(2)       =   1250.02
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000

------------------------------------------------------------------------------
         roa |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       insti |   10.85881   19.58256     0.55   0.579     -27.5223    49.23991
         emp |   2.104334    .063531    33.12   0.000     1.979816    2.228853
       _cons |    -472.32    290.806    -1.62   0.104    -1042.289    97.64918
-------------+----------------------------------------------------------------
     sigma_u |  164.22345
     sigma_e |  925.04351
         rho |  .03055411   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

```
. est store fixed

. est store random

. hausman fixed random

Note: the rank of the differenced variance matrix (0) does not equal the number of coefficients
        being tested (2); be sure this is what you expect, or there may be problems computing the
        test.  Examine the output of your estimators for anything unexpected and possibly consider
        scaling your variables so that the coefficients are on a similar scale.

                 ---- Coefficients ----
              |      (b)          (B)            (b-B)     sqrt(diag(V_b-V_B))
              |     fixed        random       Difference          S.E.
--------------+----------------------------------------------------------------
        insti |    10.85881     10.85881              0              0
          emp |    2.104334     2.104334              0              0
------------------------------------------------------------------------------
                           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(0) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                          =         0.00
                Prob>chi2 =            .
                (V_b-V_B is not positive definite)

ỳ
```