



## **EFFECT OF LIQUIDITY MANAGEMENT ON PROFITABILITY OF LISTED MANUFACTURING FIRMS IN NIGERIA**

**YAHAYA GARBA**

*Department of Accounting, Nuhu Bamalli Polytechnic, Zaria*

### **Abstract**

*This research work tends to investigate the effect of liquidity management on the profitability of manufacturing firm Nigeria. The study considers a sample size of all the manufacturing firms in the Nigeria stock exchange (NSE). Secondary data were obtained from the financial statement of the listed firms which covers a period of five years (2008-2017). Data collected were analysis using correlation matrix and Ordinary Least Square regression techniques. The result of the study revealed that current ratio is positive while quick ratio is negative and both have insignificant relationship with profitability in manufacturing firm. On the other hand, debt ratio has a positive and significant relationship with return on asset. It was recommended that management should proper manage their debt in a way to increase profitability since debt ratio has significant influence on profitability.*

**Keyword:** *liquidity management, profitability, Nigeria*

### **Introduction**

Liquidity management is a crucial issue that cut across different firms. It is a situation that describe the ease way in which an asset can be turn to cash. Liquidity measures the ability of a firm to pays its debt obligation when they are due. Lack of proper liquidity management may lead to permanent dissolution of a business entity. Some of the challenges face by business managers include procurement of funds and the proper deployment of resources for the generation of high returns. The rising cost of capital and scarcity of funds call for efficient utilization of resources, especially liquid funds. The importance of liquidity cannot be under estimated.

Many organisations focus on how to maximise its profit while it neglects the need for efficient and effective liquid asset management. This is proven by the assertion that profitability and liquidity have conflicting goals. Hence, it will be difficult to pursue both concurrently, this agrees with the theory of liquidity and profitability trade-off. Therefore, a firm, in its daily operation must maintain an equilibrium

between liquidity and profitability. This is because the inadequacy liquidity and surplus liquidity have direct effect on profitability. For instance, when the liquidity assets exceed the necessary level it results to ineffective resources utilisation, this can negatively affect profitability. While insufficient liquidity assets may result in the bankruptcy of the firms, thereby affecting their returns. Liquidity is the ability of a firm to meet its short-term obligations like payment to creditors, bills payable and outstanding expenses. It ascertains the firm's capacity to honour all its matured obligations. Meaning firm's survival hinge on liquidity management.(Yameen & Pervez, 2016).

Current ratio and quick ratio are mostly use by firms to measure their liquidity position. Current ratio is the relationship between current assets and current liabilities. Usually, the higher current ratio the better for the firm to meets its short term liabilities promptly. Quick ratio shows the relationship between quick or liquid assets and current liabilities. The liquidity of an asset is how it can be immediately converted into cash without a losing its value. Low liquidity implies companies may be unable to pay off its creditors in good time or failure to meet up the obligation to suppliers of credit, services and goods. Resulting to non- availability of supplies and possible insolvency. Also, failure to meet up with short term obligation will negatively affect the operation of the company as well as its reputation. The liquidity position of a firm is the uttermost concern of most stake holders. For instances, suppliers check the liquidity of a company before is willing to sell goods on credit. Employees should be aware of company's liquidity position so as to ascertain whether the company is able meet their related obligations, such as salary, pension, provident fund and soon. Thus, maintenance of adequate liquidity is a necessity to companies. Debt ratio shows the relationship of total liabilities and total assets, that is, it shows the ability of a company to pay off its liabilities using its assets. In a nutshell, it measures how many assets the company must dispose in order to pay off all its liabilities. A debt ratio greater than one signifies that liabilities is more than assets, this can put the company at high financial risk. On the other hand, a ratio less than one indicates the company have more assets than liabilities, which can be a health sign for the company.

Most studies done for example on liquidity and profitability are in the banking sectors: (Waleed, Pasha, & Akhtar, 2016) (Basseyy Edem, 2017) (Waleed et al., 2016) (Alshatti, 2015) (Basseyy & Moses, 2015) (Adeyanju, David, & Oluwayinka, 2011) Aziz, Sharif, & Salih, 2017). While, some were concern with other sector such as steel and automobile(Yameen & Pervez, 2016) (Noor & Lodhi, 2015), manufacturing and consumable goods (Grace Ofoegbu, 2016) (Ben-Caleb, 2013) (Imeokparia, 2015) (Bala, Garba, & Ibrahim, 2016) (Etale & Bingilar, 2016). The oil

and gas was not left out; (Bhunia & Bandyopadhyay, 2015) (Aliyu, 2016) concentrated in the oil and gas sector. To the best of the researcher's knowledge there are limited studies done on liquidity management and profitability of manufacturing firms in Nigeria which constitute a gap that this study seek to fill. Also most of the studies cover a period that is not beyond 2015, so the researcher seeks to cover a periodic gap from 2016- 2017 which may a significant difference from previous finds.

### **Objectives Studies**

The main objective of the study is to examine the effect of liquidity management on the profitability of listed manufacturing firms in Nigeria. The specific objectives are:

- i. To examine the effect of current ratio on the profitability of listed manufacturing firms in Nigeria.
- ii. To examine the effect of quick ratio on the profitability of listed manufacturing firms in Nigeria.
- iii. To examine the influence of debt ratio on the profitability of listed manufacturing firms in Nigeria.

### **Research Hypotheses**

The following hypotheses were developed in null form:

H<sub>01</sub>: Current ratio has no significant relationship with profitability of listed manufacturing firms in Nigeria.

H<sub>02</sub>: Quick ratio has no significant relationship with profitability of listed manufacturing firms in Nigeria.

H<sub>03</sub>: Debt ratio has no significant relationship with profitability of listed manufacturing firms in Nigeria.

### **Empirical Review**

Etale & Bingilar( 2016) investigated how liquidity management affect the profitability of five selected food and beverages companies in Nigeria. The study covers period between 2011-2015 and uses return on capital employed as proxy for profitability, while cash ratio, quick ratio and cash conversion cycle serve as proxies of liquidity. Descriptive statistics and multiple regression were used to analysed data collected from Nigeria Stock Exchange. The result indicated positive significant relationship of cash ratio and quick ratio on return on capital employed while negative insignificant relationship of cash conversion cycle on return on capital employed.

In another similar study conducted by (Bala et al., 2016) on corporate liquidity and profitability of listed food and beverages which covers a period of 2009-2014. The findings reveal that a strong positive association of quick ratio and account payable on return on assets, while account receivables are indirectly significant to return on assets and also cash conversion cycle was inversely but statistically insignificant related to return on assets.

Ofoegbu et al (2016) examine liquidity management and profit performance of pharmaceutical manufacturing firms in Nigeria between the period of 2000 to 2011. Multiple regression was used to analysed the data collected and only three pharmaceutical firms was considered. The study shows that debt ratio and sale growth ratio have positive and insignificant relationship on profitability while receivable ratio has negative and insignificant relationship with profitability.

Safdar et al (2016) tend to answer the question; what does matter? Liquidity or profitability of sugar industry in Pakistan. Thirty-six sugar mill were selected which is 43% of the total population. Correlation matrix, descriptive statistics and multiple regression techniques were used to analysed the data. Liquidity proxies of this study includes current ratio, quick ratio, current asset turnover ratio, inventory turnover ratio and average collection period, while proxies of profitability are return on equity, return on assets and return on capital employed. The result indicates that there is positive significant relationship between liquidity proxies and profitability proxies.

In another study by Aliyu & Umar (2016) on oil and gas company in Nigeria. They consider the leasing financing effect on liquidity management. A sample size of six companies were used for the period of January, 2005 to December, 2014. Secondary data from the annual report were analysis using descriptive, correlation and multiple regression techniques. The findings of the study show that there is insignificant effect of lease financing on liquidity of the Nigerian oil and gas companies. The recommended improvement of lease financing in the oil and gas companies.

Noor & Lodhi (2015) investigate how liquidity ratio impacted on profitability of automobile sector in Karachi between the period of 2010-2014, using a sample size of five listed automobile companies. The independent variables are current ratio and quick ratio while dependent variables is profitability with proxies of return on assets and return on equity. They find negative association between liquidity and profitability.

Mohammed et al (2015) considered a sample size of 99 listed companies using correlation matrix and regression techniques to analysis the data in examining the relationship of liquidity and profitability in Saudi stock exchange. They find out that a relationship that is positive and significant exist between current ratio and return on

assets, while negatively insignificant relationship exists between quick ratio and return on asset.

Bhunja & Bandyopadhyay (2015) investigated liquidity management of six selected crude oil and natural gas companies in India using secondary data for period of twenty-five years from 1994 to 2013 using descriptive statistics and regression analysis. They concluded that liquidity management and profitability indicators are associated but questionable in the case of liquidity efficiency indicators.

Ware (2015) conducted a research to know the relationship of liquidity management and profitability as its affect companies listed on the Ghana stock exchange in a time of tough economy. Secondary data extracted from the financial statement between the period of 2005 to 2009 were analysed using regression, descriptive statistics and correlation matrix. Return on equity serve as dependent variable as well as proxy for profitability while the proxies of liquidity are cash conversion period, average collection period and average payment period. The result of the study shows that all the liquidity proxies are statistically insignificant to profitability.

Waqas Khidmat & Mobeen Rehman ( 2014) examine the impact of liquidity and solvency on profitability in chemical sector. They conducted the study between the period of 2001 and 2009 and used a sample size of ten listed chemical companies in Pakistan by employing correlation matrix and regression to analysis the data. The study reveals that solvency ratio has a negative and significant impact on return on assets and return on equity, this implies that as debt to equity ratio increases then performance decreases; while liquidity has a positive effect on return on assets.

Nimalathan & Priya (2013) studied the relationship between liquidity management and profitability of manufacturing firm in sri-lanka covering five years period from 2008 to 2012. The study uses debtor's collection period, creditor collection period, inventory sale period, operation cash flow ratio and current ratio as proxy of liquidity management while return on assets and return on equity proxy of profitability. The findings reveal that there is a significant correlation of current ratio and inventory sale period with return on asset while operation cash flow ratio and creditor payment period are significantly correlated with return on equity.

Pecking order theory Majluf, (1984) is based on the assumption that managers of firm have more asymmetric information about the firm more outside investors and the cost of financing increase with this asymmetric information; that in financing an investment, the managers consider three sources namely: internal fund (retained profit), external fund (debt) and new equity. Companies in prioritizing their sources of financing follows an hierarchy order, that is they prefer using internal sources first, when depleted they go for debt, while new equity normally becomes the last resort. (Majluf, 1984) popularised the pecking order theory by arguing that managers

preferred less of equity as a mean to raise capital, because it is believe that managers have a better knowledge about the company's prospect, risk and value than outside investors. As such, using new equity will have sent a bad signal to investors that equity is overvalued and the manager are taking the advantage of this over-valuation. This will make investors to place a lower value to the new equity issuance.

Based on this study the relationship between debt ratio and profitability is positive and significant. This implies that an increase in debt ratio will lead to an increase in the profitability of manufacturing firms. Due to the positive and significant relationship it will advisable to choose debt financing instead of new equity as this will increase the profit of the firm.

### Methodology

The adopted correlation research design, this is base of it ability of establishing relationship between two or more variables. The population of the study comprises of all 74 listed non-financial firms in the Nigerian Stock Exchange as at 31<sup>st</sup> December 2017 which are classified into 6 subsectors namely the consumer goods (27) firms, industrial goods (20) firms, agriculture (5) firms, conglomerate (6) firms, natural resources (5) firms and health care (11) firms. In view of the nature of the model used in the study, a filter is employed to eliminate any firm that was listed after 2008. Consequently, 18 firms are eliminated leaving 56, another criteria was employed to eliminate any firm with incomplete data needed for the study and did not provide complete information of data for the study. Hence, 17 firms were eliminated leaving 39 firms. Consequently, the remaining 39 firms were utilize as sample size of the study. Secondary data was extracted from the published Audited Annual Reports and Accounts of the listed manufacturing firms from 2008 – 2017. Multiple regression technique was utilize as the data analysis technique. The Nigeria Stock Exchange Fact book of 2017 was used as a basis of ascertaining the number of listed manufacturing firms in Nigeria.

### Variable Measurement

Variables	Acronyms	Measurement
Profitability	ROA	Profit after tax /Total Assets
Current Ratio	CR	Current assets/ current liabilities
Quick Ratio	ATR	Current asset- stock/current liabilities
Debt Ratio	LDR	Total liabilities/ Total Assets
Firm Size	FS	Natural log of Total Asset
Leverage	LEV	Total Asset/Total Liabilities

Source: from different Studies

### Model Specification

$$ROA_{it} = \beta_0 + \beta_1 CR_{it} + \beta_2 ATR_{it} + \beta_3 LDR_{it} + \beta_4 FS_{it} + \beta_5 LEV_{it} + \epsilon_{it}$$

Where

$\beta_0$  = constant

$\beta_1$ -  $\beta_5$  = are coefficient of parameters estimated

ROA = Return on Asset

CR = Current Ratio

ATR = Quick Ratio

LDR = Debt Ratio

FS = Firm Size

LEV = Leverage

$\epsilon$  = Error term

### Result and Discussion

This section will discuss the result obtained from the regression model which includes; descriptive statistics, correlation matrix and lastly summary of the regression result.

### Descriptive statistics

The table 2 below will describe the nature of the data obtained from the variables of the study.

Variables	Mean	Std Dev	Min	Max
ROA	0.06	0.11	0.85	7.39
CR	1.46	0.76	0.30	7.79
QR	1.42	0.78	-0.39	7.76
DR	1.47	0.63	0.30	6.73
LEV	0.50	0.16	0.04	0.86
FS	7.26	0.93	5.26	10.23

Source: STATA Result: 2019

Table 2 is the summary statistics of the explanatory variables. The average of performance is 0.069 with the minimum of 0.85 and a maximum of 7.39. The result indicated that average performance of these firms is 6% of their total asset. Credit ratio has an average of 1.46 and ranging from the extreme values of 0.30 to 7.79 as the maximum. This implies that while some firms are substantially financed by debt in this industry others are wholly financed by equity owners. The standard deviation

of quick ratio of the sample firms stand as 0.78 followed by a minimum and maximum values of -0.39 and 7.76 respectively. Similarly debt ratio has an average value of 1.47 with a standard deviation of 0.63 and minimum and maximum values of 0.30 and 6.73. This result confirms the data of current ratio. Leverage as control variable recorded an average value of 0.50, a standard deviation of 0.16 and minimum and maximum values of 0.04 and 0.86 respectively. This result indicated that on average the total value of asset to debt in the sample firms is 50%. Finally for firm size 7.26 was recorded as the average value and 0.93 as the standard deviation while 5.26 and 10.23 was given as the minimum and the maximum values respectively.

### **Correlation Matrix**

This section is set to discuss the relationship between the dependent variable profitability and the independent variables of the study in table 3 below:

**Table 3:** Correlation Matrix

Variables	ROA	CR	QR	DR	LEV	FS
ROA	1.000					
CR	0.420	1.000				
QR	0.588	0.526	1.000			
DR	0.492	0.415	0.303	1.000		
LEV	-0.419	-0.286	-0.281	-0.373	1.000	
FS	0.025	-0.182	-0.113	-0.147	0.023	1.000

SOURCE: STATA Result: 2019

Table 3 is a correlation matrix table, which shows the relationship between all pairs of variables in the regression model. The result reveals a positive correlation between all the independent variables and the dependent variable performance (ROA) except for leverage as control variable. But the positive correlation is not very strong. Hence, the behaviour between the endogenous variables and themselves are mostly in the same direction, but despite the relationship is not strong enough to cause for collinearity. More so to further check for collinearity another robustness check was conducted. The test for multicollinearity using the variance inflation factor (VIF) and tolerance value (TV) reveals the absence of multicollinearity as all factors are below 10 and tolerance values are below 1.0, the following table 3 presents the regression summary of the study model.

### **Summary of Regression Result**



The result that shows the extent of the association between the independent variables and the dependent variable is presented and discuss in table 4 below:

**Table 4: Regression Result**

Variables	Co-eff	t-values	p-values
CR	-0.17	-7.79	0.00
QR	0.15	10.29	0.00
DR	0.06	2.99	0.00
LEV	0.03	0.73	0.47
FS	0.00	0.64	0.52
Const	-0.03	-0.05	0.59
F-Star			59.12
F-sig			0.00
R-Square			0.44
Adj. R Square			0.43

**SOURCE: STATA Result: 2019**

The results in table 4 show that there is no presence of Heteroskedasticity in the panel as indicated by the Breuch Pagan/Cook-Weisberg test for heteroskedasticity Chi2 of 1.77 with p-value of 0.1837. These suggest that the panel data are homogenous and OLS regression best suit the study.

The cumulative adjusted R<sup>2</sup> (0.44) which is the multiple coefficient of determination gives the proportion or percentage of the total variation in the dependent variable as explained by the independent variables jointly. Hence, it signifies that 44% of the total variation in performance of the sample firms is caused by the proxies of liquidity management attributes used in this study. This indicated that the model is fit and the explanatory variable are properly selected, combined and used, as proved by the Fishers' statistics of 59.12 which is statistically significance at 1% (p-value 0.00). The findings have theoretical, practical and regulatory significance. This significance represents the contributions of the study which are expected to benefit the existing body of knowledge within the accounting and finance research, regulators and providers of accounting services. This suggests that similar efforts in other sectors especially food and beverages and Nigerian deposit money Banks would be rewarding in encouraging the management to appropriately manage their liquidity for optimum return. This will further enhance the reliability of the finance sources for better economic efficiency.

Considering the relationship between current ratio and performance (ROA) of the sampled firms, the regression result in table 4 indicate that current ratio has a

negative and insignificance influence on the performance (ROA) of the sampled firms in Nigeria. This was proved by the beta coefficient value of -0.17 and a t- value of -7.79 which has a p- value of 0.000 which is significance at 1% significance level. However, this result is not surprising as it did not contradict the study expectation especially as where the easy convertible asset were not properly invested in income generating activities it may end up in tiding up cash which might result in loss to the organization by using the little earn in servicing the current liabilities. This result forms the basis of rejecting the first null hypothesis of the study which states that, there is no significance relationship between current ratio and performance of manufacturing firms listed in Nigeria.

In order to test the hypothesis that says quick ratio (QR) has no significant impact on the performance (ROA) of listed manufacturing firms in Nigeria. The regression result gives a t-value of 10.29 with a beta coefficient of 0.15 which is strongly significant at 1% significance level. This signifies that quick ratio (QR) has positive, strong and statistical impact on the performance (ROA) of manufacturing firms listed in Nigeria. This further indicates that, the higher the ratio of liquid convertible asset (current asset-stock) to the total current liabilities, the better the performance of manufacturing firms listed in Nigeria. This result is not surprising as the study expect that tiding up stock discourages performance. Therefore, where firms are said to engage in lean production/just -in-time production, the performance of these firms is expected to improve dramatically. This is because stock tide up, handling cost and other stock associated cost are saved. At the same time the result of quick ration is also in agreement with reality as asset are easily converted into cash. Hence, base on this result, the second null hypothesis is hereby rejected.

Regarding the debt ratio, which is the third independent variable used in this study, a positive and statistically significant association was established between debt ratio (DR) and the performance (ROA) of the sampled manufacturing firms listed in Nigeria. This is evidenced by the beta coefficient of 0.06, t-value of 2.99 and a p- value of 0.000. This implies that, the higher the debt ratio in manufacturing firms listed in Nigeria, the better the performance (ROA). This may be as a result of the flexible and special facility package this firms enjoyed from the lending institutions and enshrined by the relevant regulatory institutions in order to encourage investment in such sector. Thus, the third null hypothesis of the study which states that, debt ratio has no significant association with the performance of manufacturing firms listed in Nigeria is hereby rejected.

### **Conclusions and Recommendations**

Based on the findings of the research, the study concludes as follows:

The study has provided empirical evidence on the utility of three independent variables of liquidity management (current ratio, quick ratio and debt ratio) in explaining financial performance (ROA) of manufacturing firms listed in Nigeria. The result found by this study established that the liquidity management proxies utilized by this study play a prominent role in relating to financial performance (ROA) of manufacturing firms listed in Nigeria.

Based on the findings and conclusions of this study, the following recommendations are suggested as follows;

- i. The management of manufacturing firms should avoid accumulating too much short-term financing as it discourages performance. This may be a result of strict credit terms that is mostly associated with short-term facility.
- ii. The management of manufacturing firms are advised to adopt lean/just-in-time production. This is because it has a positive linkage with their improve performance. Stock holding is mostly associated with other relevant and unavoidable cost which may be avoided in lean/just-in-time production
- iii. The board of manufacturing firms should encourage the management by extending approval to explore the benefit of long-term financing of debt from the lending institutions as it is positively improving the performance of these firms.

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## Appendix

. pwcorr roce cratio qratio dratio logofta

	roce	cratio	qratio	dratio	logofta
roce	1.0000				
cratio	0.4658	1.0000			
qratio	0.4481	0.9121	1.0000		
dratio	-0.4186	-0.5205	-0.3957	1.0000	
logofta	-0.6077	-0.6025	-0.5125	0.9440	1.0000

. pwcorr roa cr atr ldr lev fs, star(0.05) sig

	roa	cr	atr	ldr	lev	fs
roa	1.0000					
cr	0.4202*	1.0000				
	0.0000					
atr	0.5677*	0.9357*	1.0000			
	0.0000	0.0000				
ldr	0.4932*	0.9145*	0.9029*	1.0000		
	0.0000	0.0000	0.0000			
lev	-0.0419	-0.3861*	-0.2812*	-0.3725*	1.0000	
	0.4096	0.0000	0.0000	0.0000		
fs	0.0245	-0.1821*	-0.1132*	-0.1467*	0.0232	1.0000
	0.6298	0.0003	0.0254	0.0037	0.6478	

. reg roa cr atr ldr lev fs

Source	SS	df	MS	Number of obs =	390
Model	3.72761506	5	.745523011	F( 5, 384) =	59.12
Residual	4.84214777	384	.01260976	Prob > F =	0.0000
				R-squared =	0.4350
				Adj R-squared =	0.4276
Total	8.56976282	389	.022030239	Root MSE =	.11229

	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
roa						
cr	-.165007	.0211684	-7.79	0.000	-.2066274	-.1233866
atr	.1454555	.0141411	10.29	0.000	.1176519	.1732592
ldr	.0557198	.018614	2.99	0.003	.0191216	.092318
lev	.0288713	.0395301	0.73	0.466	-.0488512	.1065938
fs	.0040992	.0063623	0.64	0.520	-.00841	.0166085
_cons	-.0325548	.0598293	-0.54	0.587	-.1501888	.0850791

. vif

Variable	VIF	1/VIF
cr	11.50	0.086947
atr	10.10	0.099023
ldr	7.01	0.142629
lev	1.29	0.774833
fs	1.07	0.931439
Mean VIF	6.20	

. sktest roa cr atr ldr lev fs

Skewness/Kurtosis tests for Normality

Variable	Obs	Pr(Skewness)	Pr(Kurtosis)	joint	
				adj chi2(2)	Prob>chi2
roa	390	0.0000	0.0000	.	0.0000
cr	390	0.0000	0.0000	.	0.0000
atr	390	0.0000	0.0000	.	0.0000
ldr	390	0.0000	0.0000	.	0.0000
lev	390	0.0210	0.5143	5.76	0.0561
fs	390	0.0000	0.0037	33.56	0.0000

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Ho: Constant variance

Variables: fitted values of roa

chi2(1) = 2.11

Prob > chi2 = 0.1464

. xtset id year, yearly

panel variable: id (strongly balanced)

time variable: year, 2008 to 2017

delta: 1 year



. hausman fixed random

	Coefficients		(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
	(b) fixed	(B) random		
cr	-.1710314	-.1697393	-.001292	.0072306
atr	.159036	.1555129	.0035231	.0053316
ldr	.0411731	.0452246	-.0040516	.0046693
lev	.0067713	.0100198	-.0032485	.030101
fs	.0345717	.0065387	.028033	.0277626

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(5) = (b-B)'[(V\_b-V\_B)^(-1)](b-B)  
 = 3.34  
 Prob>chi2 = 0.6478

. xttest0

Breusch and Pagan Lagrangian multiplier test for random effects

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

Estimated results:

	Var	sd = sqrt(Var)
roa	.0220302	.1484259
e	.0100359	.1001796
u	.002866	.0535352

Test: Var(u) = 0

chibar2(01) = 68.17  
 Prob > chibar2 = 0.0000

. xtreg roa cr atr ldr lev fs, re robust

Random-effects GLS regression      Number of obs      =      390  
 Group variable: id                    Number of groups    =      39  
  
 R-sq: within = 0.4949                    Obs per group: min =      10  
           between = 0.1996                                       avg =      10.0  
           overall = 0.4338                                       max =      10  
  
    Wald chi2(5)            =      263.70  
 corr(u\_i, X) = 0 (assumed)                Prob > chi2            =      0.0000

(Std. Err. adjusted for 39 clusters in id)

	Coef.	Robust Std. Err.	z	P> z	[95% Conf. Interval]	
roa						
cr	-.1697393	.0250004	-6.79	0.000	-.2187392	-.1207394
atr	.1555129	.0259101	6.00	0.000	.10473	.2062958
ldr	.0452246	.0236923	1.91	0.056	-.0012115	.0916607
lev	.0100198	.0372401	0.27	0.788	-.0629695	.083009
fs	.0065387	.0118143	0.55	0.580	-.016617	.0296943
_cons	-.0328567	.1023276	-0.32	0.748	-.2334151	.1677018
sigma_u	.05353516					
sigma_e	.10017959					
rho	.2221378	(fraction of variance due to u_i)				