

The Impact of Working Capital Management on Profitability of Nigerian Firms: A Preliminary Investigation

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Abstract

This study investigated the impact of working capital policies of Nigerian firms on profitability for the period, 2004-2008. Adopting the aggressive investment working capital policies and aggressive financing policies as independent variables and return on assets as dependent variable and controlling for size and leverage, the study revealed that aggressive investment working capital policies of Nigerian firms have a positive significant impact on profitability while aggressive financing policies have a positive non-significant impact on profitability. The findings from this study indicate that firms pursuing aggressive investment working capital policy will become risky in the long-run because as profitability increases; the firm grows and the amount of outsiders' contributions also increases. The result also indicates that as the firm grows and outsiders' contribution increases; the use of aggressive financing working capital policy decreases the profitability of the firm. Appropriate management of working capital is therefore essential if the firms are to achieve their objective of improved profitability and value creation for shareholders.

Keywords: Working Capital Management, Profitability, Nigerian Firms.

1.0 Introduction

The four financing decisions which the financial manager makes in the day-to-day running of the firm are investment decisions (long-term asset mix); financing decisions (capital-mix); dividend decisions (profit allocation) and the liquidity decisions (short-term asset-mix). None of these four decisions is more important than the other; hence a good financial manager should attach equal importance to these decisions as the firm strives to maximize its value. However, the corporate finance literature had traditionally focused on the study of long-term financial decisions, particularly investments, capital structure, dividends or company valuation decisions (Nazir and Afza, 2009). Short-term assets and liabilities are important components of the total assets of the firm hence; need for their carefully analysis. The management of these short-term assets and liabilities warrants a careful investigation since it plays an important role in firm's profitability, risk as well as ensuring maximization of the firm's value (Smith, 1980). Efficient management of working capital is thus a fundamental part of the overall corporate strategy of the firm in creating the shareholders' value, keeping in mind that an optimal level of working capital will maximize the firms' value (DeLoof, 2003; Howorth and Westhead, 2003).

Lack of liquidity (or illiquidity) in extreme situations can lead to firm's insolvency (Pandey, 2007). However, a conflict exists between profitability and liquidity while managing the current assets of the firm. Where the firm does not invest sufficient funds in current assets, it may become illiquid and therefore risky and could lose profitability as idle current assets would not earn anything, hence, a proper trade-off must be achieved between profitability and liquidity. This requires the development of sound techniques of managing the working capital. There are two main types of working capital policies of the firm viz: aggressive and conservative working capital policies. While the aggressive working capital policies is said to be followed by the firm when it uses more short-term financing than warranted by the matching plan, the firm uses funds for permanent fixed assets for short-term financing, the conservative approach involves and depends more on long-term funds for the financing needs of the firm (Pandey, 2007). This paper therefore adopted the aggressive working capital approach and against this background examines the impact of working capital management on the profitability of Nigeria firms for the period 2004-2008 using return on assets as a measure of profitability; and the aggressive investment policy as used by Weinraub and Visscher (1998) and the aggressive financing policy (Nazir and Afza, 2009) as proxies for working capital management. This study is of preliminary nature as prelude to a more inclusive one. This paper is organized into five sections. Section one is the introduction. Section two presents related literature. Section three contains the methodology. Section four

shows the empirical analysis of the impact of working capital management on profitability of selected Nigerian firms. Finally, section five contains the policy implications and conclusion.

2.0 Review of Related Literature

Working capital management refers to the administration of all components of working capital such as cash, marketable securities, debtors and stock receivables, etc (Pandey, 2007). The importance of the working capital management function of the firm is crucial to the firm because it involves time, investment as well as growth prospects of the firm. Financial managers place much premium on its proper management though much emphasis has been placed in corporate finance literature on the study of long-term financial decisions, particularly investments, capital structure, dividends and company valuation decisions. Several Research though limited have also been carried out in this important area of corporate finance.

Eljelly (2004) empirically examined the relationship between profitability and liquidity, as measured by current ratio and cash gap (cash conversion cycle) on a sample of 929 joint stock companies in Saudi Arabia. Using correlation and regression analysis, he found significant negative relationship between the firm profitability and liquidity level, as measured by current ratio. This relationship is more pronounced for firms with high current ratios and long cash conversion cycles. At the industry level, however, he found that the cash conversion cycle or the cash gap is of more importance as a measure of liquidity than current ratio that affects profitability. The firm size variable was also found to have significant effect on profitability at the industry level.

Lazaridis and Tryfonidis (2006) conducted a cross sectional study using a sample of 131 firms listed on the Athens Stock Exchange for the period of 2001 - 2004 and found statistically significant relationship between profitability, measured through gross operating profit; and the cash conversion cycle and its components (accounts receivables, accounts payables, and inventory). Based on the results of analysis of annual data by using correlation and regression tests, they suggest that managers can create profits for their companies by correctly handling the cash conversion cycle and by keeping each component of the conversion cycle (accounts receivables, accounts payables, and inventory) at an optimal level.

Raheman and Nasr (2007) argue that working capital management has its effect on liquidity as well on profitability of the firm and hence studied the effect of different variables of working capital management including the average collection period, inventory turnover in days, average payment period, cash conversion cycle and current ratio on the net operating profitability of Pakistani firms. Debt ratio, size of the firm (measured in terms of natural logarithm of sales) and financial assets to total assets ratio were used as control variables. Their results showed strong negative relationship between variables of the working capital management and profitability of the firm. It means that as the cash conversion cycle increases it will lead to decreasing profitability of the firm, and managers can create a positive value for the shareholders by reducing the cash conversion cycle to a possible minimum level. They also found that there is a significant negative relationship between liquidity and profitability; that there is a positive relationship between size of the firm and its profitability; and significant negative relationship between debt used by the firm and its profitability.

Saleem and Rehman (2011) posit that every firm has to maintain relationship while in conducting day to day operations hence they studied the impact of liquidity ratios on profitability of oil and gas companies in Pakistan. The results showed that there is a significant impact of only liquid ratio on ROA while insignificant on ROE and ROI. The results also showed that ROE is not significant affected by three ratios: current ratio, quick ratio and liquid ratio while ROI is greatly affected by current ratios, quick ratios and liquid ratio. The main results of the study demonstrate that each ratio (variable) has a significant effect on the financial positions of enterprises with differing amounts and along with the liquidity ratios in the first place. The study, therefore, recommended that companies need to maintain adequate liquidity as some portion of the firms' profitability will be divided to shareholders.

Filbeck and Krueger (2005) highlighted the importance of efficient working capital management by analyzing the working capital management policies of 32 non-financial industries in the United States of America (USA). According to their findings, significant differences exist among industries in working capital practices overtime. Moreover, these working capital practices, themselves, change significantly within industries.

Weinraub and Visscher (1998) discussed the issue of aggressive and conservative working capital management policies by using quarterly data for the period 1984-93 of the US firms. Their study considered 10 diverse industry groups to examine the relative relationship between their aggressive/conservative working capital policies. Their study concluded that the industries had distinctive and significantly different working capital management policies. Moreover, the relative nature of the working capital management policies exhibited remarkable stability over the 10-year study period. The study also showed a high and significant negative correlation between industry asset and liability policies and found that when relatively aggressive working capital asset policies are followed, they are balanced by relatively conservative working capital financial policies.

Soenen (1993) investigated the relationship between the net trade cycle as a measure of working capital and return on investment in the USA firms. The results of chi-square test indicated a negative relationship between the length of net trade cycle and return on assets. Furthermore, this inverse relationship was found different, across industries depending on the type of industry. A significant relationship for about half of the industries studied indicated that results might vary from industry to industry.

Lamberson (1995) studied how small firms respond to changes in economic activities by changing their working capital requirements and level of current assets and liabilities. Current ratio, current assets to total assets ratio and inventory to total assets ratio were used as a measure of working capital requirement, while the index of annual average coincident economic indicator was used as a measure of economic activity. Contrary to the expectations, the study found that there is a very small relationship between changes in economic conditions and changes in working capital.

3.0 Methodology

This paper relied on historic accounting data obtained from the financial statements and accounts of 28 quoted firms on the Nigerian Stock Exchange from 2004 to 2008, hence, the adoption of the *ex-post facto* research design (Onwumere, 2009). Company annual statements and reports are deemed to be reliable because they are statutorily required to be audited by a recognized auditing firm before publication (CAMA, Section 331 – 335). One (1) firm was selected from the following sub sectors;- Agriculture; Airline; Automobile; Breweries; Building materials; Chemical and Paints; Commercial Services; Computer and Office Equipments; Conglomerates; Construction; Engineering Technology; Footwares; Food, Beverages and Tobacco; Health Care; Hotel and Tourism; Industrial and Cosmetic Products; Information and Communication Technology; Leasing; Machinery and Marketing; Maritime; Media; Packaging; Petroleum; Printing and Publishing; Road Construction; Road Transportation and Textiles subsectors. The multiple regression technique was used in analyzing the models stated. The ideas behind regression analysis are the statistical dependence of one variable, the dependent variable in this case return on assets (ROA), on one or more variables, the independent or explanatory variables and also, our objectives to estimate and/or predict the mean or average value of the dependent variable on the basis of the known or fixed values of the explanatory variables (aggressive investment policy and aggressive financing policy) of working capital along with two control variables; size of the firm and financial leverage

The general form for a multiple regression analysis is given in the form below:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 \dots \beta_n X_n + \mu \dots \dots \dots (i)$$

where

- Y = dependent variable
- β_0 = equation constant
- $\beta_1, \beta_2, \beta_3, \beta_4 \dots \beta_n$ = coefficients of explanatory variables
- $X_1, X_2, X_3, X_4 \dots X_n$ = independent or explanatory variables
- μ = error term

In this particular equation, the constants $\beta_1, \beta_2, \beta_3, \beta_4 \dots \beta_n$ determine the slope or gradient of the line and the constant term β_0 determines the point at which the line crosses the Y-axis, otherwise known as the Y-intercept (see, Gujarati, 1995).

Given the above general multiple variable regression function and adopting the aggressive investment policy (Weinraub and Visscher, 1998) and aggressive financing policy (Nazir and Afza, 2009) as proxies for working capital management into the modified regression, we have:

For model 1:

$$ROA = \beta_0 + \beta_1 TCA/TA + \beta_2 SIZE + \beta_3 LEVRG + \mu \dots \dots \dots (ii)$$

and model 2

$$ROA = \beta_0 + \beta_1 TCL/TA + \beta_2 SIZE + \beta_3 LEVRG + \mu \dots \dots \dots (ii)$$

where

- ROA = Return on Assets
- TCA = Total Current Assets
- TCL = Total Current Liabilities
- TA = Total Assets
- Size = Natural Log of Total Assets
- LEVRG = Debt/Equity Ratio

Description of Variables

Dependent Variable

Return on Assets (ROA)

The impact of working capital policies on the profitability has been analyzed through accounting measures of profitability as well as market measures of profitability, i.e., Return on Assets (ROA) and Tobin's *q* ((Nazir and Afza, 2009), Net Operating Profitability (NOP) (Raheman and Nasr, 2007). However as stated earlier, this paper used return on assets (ROA) as proxy for working capital. Another name for it is return on investment and it was measured by:

$$ROA = PAT/NA \dots \dots \dots (v)$$

where

- PAT = Profit after Tax
- NA = Net Assets

Independent Variables

Aggressive Investment Policy (AIP)

Nazir and Afza (2009) posit that Aggressive Investment Policy (AIP) results in minimal level of investment in current assets versus fixed assets. In contrast, a conservative investment policy places a greater proportion of capital in liquid assets with the opportunity cost of less profitability. If the level of current assets increases in proportion to the total assets of the firm, the management is said to be more conservative in managing the current assets of the firm. In order to measure the degree of aggressiveness of working capital investment policy, we adopted Weinraub and Visscher (1998) ratio for aggressive investment policy of firms, hence;

$$AIP = Total Current Assets TCA/ Total Assets (TA) \dots \dots \dots (iii)$$

Aggressive Financing Policy (AFP)

An Aggressive Financing Policy (AFP) utilizes higher levels of current liabilities and less long-term debt. In contrast, a conservative financing policy uses more long-term debt and capital and less current liabilities. The firms are more aggressive in terms of current liabilities management if they are concentrating on the use of more current liabilities which put their liquidity on risk (Nazir and Afza, 2009). It is represented as;

$$AFP = Total Current Liabilities (TCL)/ Total Assets (TA) \dots \dots \dots (iv)$$

Control Variables

SIZE

The size of the firm (SIZE) is measured by the natural logarithm of its total assets, as the original large value of total assets may disturb the analysis (see, Nazir and Afza, 2009; Padachi, 2006; Alam, Ali, Rehman and Akram (2011). Therefore, the size of the firms is represented as;

$$\text{Size} = \text{Natural logarithm of Total Assets} \dots\dots\dots (vi)$$

LEVRG

This is the relationship that described the lenders’ contribution for each owner’s contribution. It is, therefore, a financial leverage ratio and a proxy for gearing. It was calculated by dividing total debt by net worth (total net assets or total assets less current liabilities) of each firm for the whole sample period (see, Nazir and Afza, 2009; Padachi, 2006; Alam, Ali, Rehman and Akram, 2011).

$$\text{LEVRG} = \text{Total Debt/Total Net Assets} \dots\dots\dots (viii)$$

Table 3.1 presents the model proxies as computed from appendix one

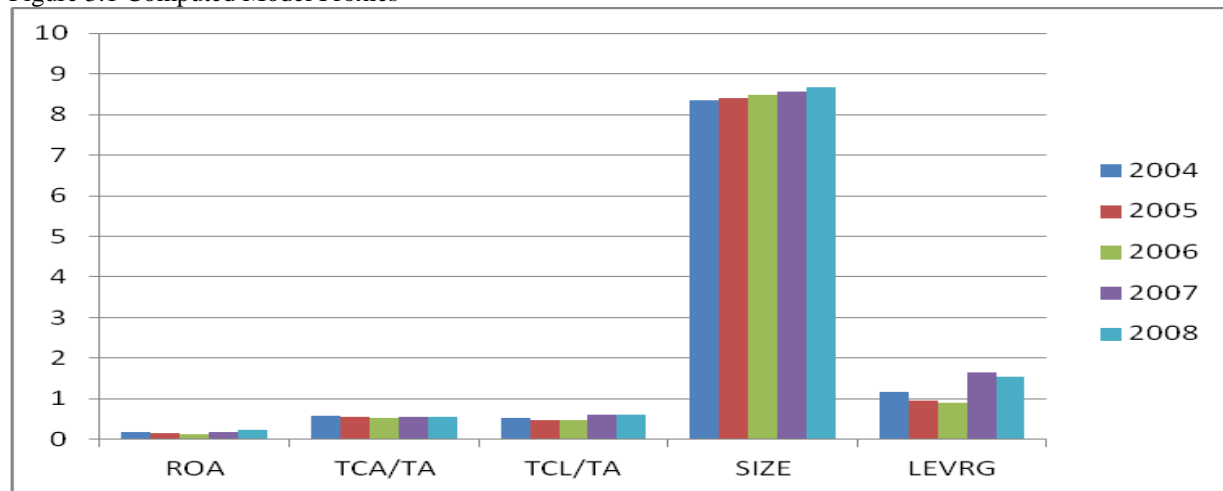
Table 3.1 Computed Model Proxies

Year	ROA	TCA/TA	TCL/TA	SIZE	LEVRG
2004	0.18474	0.57584	0.5211	8.341	1.1629488
2005	0.14872	0.55894	0.484	8.402	0.944393
2006	0.1301	0.52816	0.4692	8.472	0.8913917
2007	0.19219	0.55145	0.6173	8.553	1.6406053
2008	0.22728	0.5644	0.5997	8.666	1.5397911

Source: See appendix 1

Figure 3.1 is a graphical presentation of the computed model proxies

Figure 3.1 Computed Model Proxies



Source: Appendix 1

A cursory look at the above table and figure (table 3.1 and figure 3.1) reveals that in 2008, Nigerian firms return on assets was high when compared to 2007, 2006, 2005 and 2004. The return on assets was 0.22728 (2008). This was followed by 2007 (0.19219), 2004 (0.18474), 2005 (0.14872) and 2006 (0.1301). The aggressive investment working capital policy represented by total current assets divided by total assets, the table revealed that in 2004 which

recorded the highest it was 0.57584, followed by 2008 (0.5644), 2005 (0.55894), 2007 (0.55145) and 2006 (0.52816) in that order. For the aggressive financing working capital policy of Nigeria firms as represented by total current liabilities divided by total assets, 2007 recorded the highest (0.6173), this was followed by 2008 (0.5997), 2004 (0.5211), 2005 (0.484) and 2006 (0.4692). The SIZE of Nigeria firms represented by the natural logarithm of the total assets as revealed from the table and figure shows a sustained increase from 2004-2008. This is quite impressive, as it indicates a sustained growth in total assets of firms in Nigeria. It was 8.341, 8.402, 8.472, 8.553 and 8.666. On leverage, which indicates the amount of outsiders' contributions to financial mix of Nigerian firms, the highest was recorded in 2007 (1.6406), and was followed by 2008 (1.5398), 2004 (1.1630), 2005 (0.9444) and 2006 (0.8914) in that order, respectively.

4.0 Results/Analysis

Table 4.1 below is the summary of results from Estimation of the two models

Table 4.1 SPSS Model Results

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	F Change	t-value	Beta	Durbin Watson
1	.987a	.974	.898	.0121939	12.708	-	-	3.256
2	.873a	.762	.048	.0372094	1.067	-	-	1.855
AIP*	-	-	-	-	-	2.915	.611	-
SIZE*	-	-	-	-	-	1.767	.489	-
LEVRG*	-	-	-	-	-	1.132	.327	-
AFP	-	-	-	-	-	.140	2.224	-
SIZE	-	-	-	-	-	-.050	-.039	-
LEVRG	-	-	-	-	-	-.085	-1.325	-

Source: See Appendix 2

*Model 1

Model Equation

$$\begin{aligned} \text{Model 1 ROA} &= -1.836 + 1.308\text{AIP} + 0.146\text{SIZE} + 0.037\text{LEVRG} + \mu \\ \text{Model 2 ROA} &= -0.221 + 1.26\text{AFP} - 0.012\text{SIZE} - 0.148\text{LEVRG} + \mu \end{aligned}$$

From the result as revealed by table 4.1, for model 1, aggressive investment working capital policies of Nigerian firms have a positive significant impact on profitability measured by return on assets (ROA) of Nigerian firms. The coefficient of Aggressive investment policy (AIP) was 1.308 and t-value = 2.915. For the control variables SIZE and LEVERAGE, the result was positive though not significant. The t-value = 1.767, coefficient of Size = 0.146 (SIZE) and t-value = 1.132 and coefficient of LEVRG = 0.037 (LEVERAGE) respectively. The result also revealed that the correlation between the model proxies the (aggressive investment policies, size and leverage) and profitability was positive for the period. The beta coefficients of the independent variables were found to be positive (0.611, 0.489 and 0.327 respectively). Overall for model one, the coefficient of determination (R^2) was 97.4% indicating that the variations observed in the dependent variable were appropriately captured by the model proxies. The Durbin Watson (d) test statistic was 3.256.

For model 2 as revealed by the results, aggressive financing working capital policies of Nigerian firms have a positive non-significant impact on profitability of Nigerian firms. The coefficient of Aggressive financing policy (AFP) was 1.26 and t-value = 0.140. For the control variables SIZE and LEVERAGE, the result was negative and non-significant. Also observable were t-value = -0.050, coefficient of Size = 0.012 (SIZE) and t-value = -0.085 and coefficient of LEVRG = 0.148 (LEVERAGE). The result also revealed that the correlation between the model proxies the (aggressive investment policies, size and leverage) and profitability was mixed. The beta coefficient of aggressive financing policies (AFP) was found to be positive (2.224) and negative for the control variables for the period under study (-0.039 and -1.325 respectively). Overall for model 2, the coefficient of determination (R^2) was 76.2% indicating that the variations observed in the dependent variable were appropriately captured by the model proxies. The Durbin Watson (d) test statistic was 1.855.

5.0 Implications/Conclusion

The results emanating from this study are quite revealing for Nigerian firms. A firm's investment decisions involve the commitment and allocation of funds to long-term assets that yield benefits in the future, while the financing decision involves obtaining the best financing mix or optimum capital structure for the firm. The result revealed positive impact of both aggressive investment and financing capital working policies on profitability of Nigerian firms for the period the study covered. This indicates that as more short-term funds are committed, both for investment and financing decisions, the profitability of the firm increases.

According to Pandey (2007), the profitability-liquidity trade-off requires that the firm should develop sound techniques of managing working capital. A sound working capital policy of the firm ensures that risks are minimized and value created for shareholders. The findings from this study indicate that firms pursuing aggressive investment working capital policy will become risky in the long-run. As profitability increases; the firm grows and the amount of outsiders' contributions also increases. When profitability and growth of the firms are not proportional to outsiders' contributions, the firm becomes risky as the firm may be unable to meet-up its financial obligations as at when due, which in extreme cases lead to insolvency (bankruptcy). Firms pursuing aggressive financing working capital policies increase profitability as revealed from the findings. The result indicates that as the firm grows and outsiders' contribution increases; the use of aggressive financing working capital policy decreases the profitability of the firm. It is therefore imperative that Nigerian Firms must adopt appropriate working capital management approach in order to achieve the objectives of enhanced profitability and value creation for shareholders. This study no doubt appropriately underlines the significance of working capital management for managers of Nigerian firms, a lesson after all for firms in developing countries (in which category Nigeria belongs).

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Appendix

Appendix One

The 28 Nigerian Firms Aggregate Values of Parameters

Year	TCA (N, 000)	TCL (N,000)	TA (N,000)	Turnover (N,000)	TD (N,000)	NET ASSETS	PAT (N,000)
2004	126,134,941	114,143,943	219,043,612	283,541,670	121,992,948	104,899,669	19,379,614
2005	141,034,609	122,135,790	252,326,883	342,479,020	122,951,553	130,191,093	19,362,376
2006	156,640,876	139,153,332	296,578,551	374,231,898	140,327,534	157,425,219	20,481,633
2007	197,036,898	220,567,536	357,308,939	445,584,655	224,338,670	136,741,403	26,280,920
2008	261,450,204	277,782,265	463,233,331	548,531,029	285,555,907	185,451,066	42,149,584

Source: The Financial statement and Accounts of the 28 firms for the various years

Appendix Two

Correlations

		ROA	AIP	SIZE	LEVRG
Pearson Correlation	ROA	1.000	.637	.615	.870
	AIP	.637	1.000	-.168	.329
	SIZE	.615	-.168	1.000	.699
	LEVRG	.870	.329	.699	1.000
Sig. (1-tailed)	ROA	.	.124	.135	.028
	AIP	.124	.	.394	.294
	SIZE	.135	.394	.	.094
	LEVRG	.028	.294	.094	.
N	ROA	5	5	5	5
	AIP	5	5	5	5
	SIZE	5	5	5	5
	LEVRG	5	5	5	5

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	F Change	Durbin Watson
1	.987a	.974	.898	.0121939	12.708	3.256

a Predictors: (Constant), LEVRG, AIP, SIZE

b Dependent Variable: ROA

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients	
		B	Std. Error	Beta	T
1	(Constant)	-1.836	.840		-2.187
	AIP	1.308	.449	.611	2.915
	SIZE	.146	.083	.489	1.767
	LEVRG	.037	.032	.327	1.132

a Dependent Variable: ROA

Model 2

Correlations

		ROA	AFP	SIZE	LEVRG
Pearson Correlation	ROA	1.000	.872	.615	.870
	AFP	.872	1.000	.711	.999
	SIZE	.615	.711	1.000	.699
	LEVRG	.870	.999	.699	1.000
Sig. (1-tailed)	ROA	.	.027	.135	.028
	AFP	.027	.	.089	.000
	SIZE	.135	.089	.	.094
	LEVRG	.028	.000	.094	.
N	ROA	5	5	5	5
	AFP	5	5	5	5
	SIZE	5	5	5	5
	LEVRG	5	5	5	5

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	F Change	Durbin Watson
1	.873a	.762	.048	.0372094	1.067	1.855

a Predictors: (Constant), LEVRG, SIZE, AFP

b Dependent Variable: ROA

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients	
		B	Std. Error	Beta	T
1	(Constant)	-.221	2.409		-.092
	AFP	1.264	9.007	2.224	.140
	SIZE	-.012	.233	-.039	-.050
	LEVRG	-.148	1.744	-1.325	-.085

a Dependent Variable: ROA