The Impact of Financial Leverage, Growth, and Size on Profitability of Jordanian Industrial Listed Companies

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Abstract

The main purpose of this study is to investigate the impact of Financial leverage, Company's Growth , non-current / total assets ratio , and firm's Size as independent variables on profitability in proxy of Return On Assets ratio (ROA) as dependent variable. A sample of 25 Jordanian Industrial companies listed on Amman Stock Exchange(ASE) for a period of 10 years (from 1995-2005) was selected. The results of the research show that there is a significant effect of the Financial Leverage and Growth on profitability of industrial companies. Therefore, industrial companies may enhance the profitability of their firms by minimizing the debt, and increasing financial assets compared with total assets. Therefore, the study concludes some recommendations that are beneficial to the stakeholders.

Keywords: Leverage, Profitability, Industrial companies, Jordan.

1. Introduction

The use of financial ratios is a time-tested method of analyzing a business. Amman Stock Exchange (ASE), investment firms, bank loan officers and knowledgeable business owners all use financial ratio analysis to learn more about a company's current financial health as well as its potential .In financial affairs of companies, financial leverage is a very important factor in the business sectors working in the developing countries, which has a direct positive to provide more funds to the company. Financial leverage and profitability are both the two pillars that companies might give them more attention. For this case, optimum level of debt guarantees a firm to meet their short-term requirements and the proper management of flow can be promised by a profitable business. The ability of the company to earn profit can be referred to as the profitability of that company. Profit is determined by deducting expenses from the revenue incurred in generating that revenue. The amount of profit can be a good measure of the performance of a company, so we can use profitability, as a measure of the financial performance of a company, as well as, profitability is the promise for a company to remain a going concern in the world of business. Effective financial leverage is very important due to its significant effect on profitability of company and thus the existence of company in the market. However, management can face liquidity problems due to underinvestment in working capital due to the scarcity of liquidity. Big firms have more competitive power when compared to small firms in fields requiring competition. Since they have a bigger market share, big firms have the opportunity to profit more. In addition to this, big firms are able to seize the opportunity to work in the fields, which require high capital rates since they have larger resources, and this situation provides them the opportunity to work in more profitable fields with little competition (Bayyurt, 2007:582). When the studies concerning the relation between firm size and profitability are reviewed, mixed results have been found present. Jonsson (2007) Serrasqueiro (2008), Lee (2009), Stierwald (2009), Saliha and Abdessatar (2011), have found a positive relation between firm size and profitability. On the contrary, Banchuenvijit (2012) has found a negative relation between firm size and profitability. Other than above studies, Whittington (1980) has found that firm size does not have an effect on profitability. These results cause a vague understanding of the effect of firm size on profitability and an increase in the interest toward this subject.

Study consists of five sections. The first section investigates the Financial Leverage, Growth ratio of non-current assets / total assets, and Firm's Size on Profitability of Jordanian Industrial Firms Listed on Amman Stock Exchange (ASE). Second section consists of introduction and Literature review .Third section consists of *metho*dology and sampling of the study. Forth section contains the results of analysis. And a general assessment of the study has been put forth in the last section.

2. Related Literature Review

Many researchers have studied financial leverage, firm size and profitability from different views and in different environments. The following ones were very interesting and useful for our research:

Afza and Hussain [2011, p. 220) describe that debt is considered as a way to highlight investors' trust in the firm. If a firm issues debt, it provides a signal to the market that the firm is expecting positive cash flows in the future. Thus, the higher level of debt shows the confidence of the managers in future cash flows but another impact of the signaling factor is the problem of underpricing of equity. If a firm issues equity instead of debt for financing its new projects, investors will interpret the signal negatively. Biger *et al.* [2008] collected data from enterprise's census 2002-2003 conducted by the General Statistical Office, Vietnam. Through correlation analysis, they found that financial leverage in Vietnamese firms increases with firm size, and

decreases with profitability and with non-debt tax shield. Financial leverage also correlated with industry characteristics. They also found that i) firm's leverage increase with fixed assets and decrease with growth opportunities and ii) corporate income tax has the negative albeit small effect on firm's financial leverage. Abor [2005] collected data from listed firms in Ghana and found a positive relationship between profitability and leverage. Nguyen and Neelakantan [2006] used small and medium Vietnamese firms to collect data and found that leverage is positively related to firm growth and firm size, and negatively related to tangibility.

The ROA can be used on my research because all the companies of the sample operate in the same industry. Thus by analyzing the different ROA of the firms I will be able to verify if the profitability is in some way related to the liquidity levels. The ROE would not provide a good comparison because the small and the negative equity levels of some companies would generate distorted indicators of profitability. The ROA is calculated by dividing the net income of each period over the total assets of the companies. Since both numbers could be easily found on the financial statements on, the annual reports it was hard to make a table with this ratio. Profitability can be defined as the final measure of economic success achieved by a company in relation to the capital invested in it. This economic success is determined by the magnitude of the net profit accounting (Pimentel et al, 2005 p.86). Solvency and liquidity are two concepts that are closely related and reflect upon the actions of company's working capital policy. A low liquidity level may lead to increasing financial costs and result in the incapacity to pay its obligations. (Maness & Zietlow 2005, p.25) , Thus the Optimal level for liquidity would be obtained by a trade-offs between the low return of current assets and the benefit of minimizing the need for external finance (Kim, Mauer, and Sherman, 1998, p.335). Eljelly (2004) examined the relation between profitability and liquidity measured by current ratio and cash gap (cash conversion cycle) on a sample of joint stock companies in Saudi Arabia using correlation and regression analysis. They found a negative relationship between profitability and liquidity indicators, and it was found that CCC had a bigger impact over profitability then Current ratio. Also it was observed that there was great variation among industries with respect to the significant measure of liquidity. Raheman and Nasr (2007) studied the relationship between Working Capital Management and profitability for 94 Pakistanian companies listed on Karachi Stock Exchange. Between their findings, it was observed a significant negative relationship between companies' liquidity and profitability. According to Raheman and Nasr (2007) Leverage means, funds take from outsider parties' like's banks, capital market, money market and other financial institutions. If a business is leveraged, we can say that firm takes loans to purchase assets. Made the research of ninety-four firms listed in KSE and take the results on WCM and profitability. He judged that there is the indirect correlation among profitability and WCM. In addition, they founded that leverage and liquidity have indirect correlation with WCM but size of the firm has direct relationship with profitability.

One can say a company with low liquidity and high profitability has to increase its borrowing leading to an increase of the financial costs. Thus, the Optimal level for liquidity would be obtained by a trade-offs between the low return of current assets and the benefit of minimizing the need for external finance (Kim, Mauer, and Sherman, 1998, p.335). Thus, for Hirigoyen (Ibid) the profitability and solvency are necessary condition for the healthy existence of the company and both are conditioned by the strategy adopted in the medium and long term. On his work, Hirigoyen was based on three premises, namely:

(1) The profitability ensures the development of the company. However, the obsessive quest for profitability may undermine the solvency of the company;

(2) The solvency reduces the total risk of the company, showing that the net working capital can reduce the risk of bankruptcy. However, a very large safety margin restricts profitability;

(3) The profitability and solvency are conditioned by the company's strategy. The company's growth brings with it a progressive increase in financial needs for the operational cycle, leading to a change in the solvency capacity. Odit and Gobardhun [2011] collected data from Mauritius firms. The authors found a positive association between leverage, asset structure, and firm's growth. Afza and Hussain [2011] used pooled data regression model on the sample of 26 firms of Automobile sector of Pakistan and found that capital structure is negatively correlated with profitability and positively correlated with taxes.

In summary, we observe the previous literature considers that some of studies showed a positive sign and others presented a negative relationship between leverage and profitability, and this relationship has been tested and confirmed in several studies in different markets. The current study attempts to enhance the knowledge of companies by identifying the ways that industrial companies manage their debt, sales, enlarge their sizes in order to increase profitability. To analyze this problem statement. I have developed objectives of my research, which will hopefully contribute towards a very important aspect of financial management. It is almost untouched in Jordan or very little research has been done in this area.   The main objectives of the current study:

- To establish a relationship between Leverage Ratio and Profitability over a period of ten years for 25 Jordanian Industrial companies listed.
- To find out the effects of different components (Growth, Size, Noncurrent Assets to Total Assets) on profitability.

3. Methodology

To remain consistent with previous studies, we used cross sectional yearly data and measured the variables as follows:

3.1 Data Collection

Data was built from a selection of approximately 25 financial reports from publicly industrial companies between Dec.31, 1995 and December 31, 2005 , all variables were calculated using book value. To examine the data, the following analysis was done. The descriptive statistics of the data is:

Descriptive statistics for 25 industrial firms. Standard deviation of different variables with the minimum and maximum values, mean and median are presented in table 1. The total of observations sums to n = 275, for a period of 10 years. Total ROA have a mean of 0.064304, while the median is 0.054111. DEBT has a mean of 0.317530 and a median of 0.282563, while the maximum and minimum values for DEBT are 1.778332 and 0.000000 respectively, other means and medians for the rest of variables can be observed from the table below. Mean of Return on asset is 0.064304 of total fixed assets. It described that firms have average Return on asset is 6.43 percent. Its standard deviation is 26.67, which show that there is high deviation in Return on asset margin among sampled firms in our analysis.

3.2 Hypotheses Testing

Since the objective of this study is to examine the impact of Financial Leverage, Growth and Size Affect Profitability of Jordanian Industrial Firms Listed, the study makes a set of testable hypothesis in form of [H0] versus [H1].

Hypothesis 1:

H01: *There is no significant relationship between Leverage ratio and profitability of Jordanian industrial companies listed in ASE.*

H11: *There is a significant relationship between Leverage ratio and profitability of Jordanian industrial companies listed in ASE.*

Hypothesis 2:

H02: *There is no significant relationship between fixed assets to total assets ratio and return on assets*

H12: *There is a significant relationship between fixed assets to total assets and return on assets*

Hypothesis 3:

H03: *There is no relationship between growth of Jordanian industrial companies   and profitability.*

H13: *There may exist a relationship between the firm's growth of Jordanian industrial companies   and profitability.*

Hypothesis 4:

H04: *There is no significant relationship between size of Jordanian industrial companies   and profitability.*

H14: *There may exist a significant relationship between the firm size of Jordanian industrial companies   and profitability.*

3.3 Model Specifications:

Our study uses panel data regression analysis of cross-sectional and time series data. We use the pooled regression type of panel data analysis. The pooled regression, also called the constant coefficients model is one where both intercepts and slopes are constant, where the cross section firm data and time series data are pooled together in a single column assuming that there is no significant cross section or temporal effects. The general form of our model is as follows:

$$\text{ROA it} = \beta_0 + (\beta_1) (\text{DEBT ratio it}) + (\beta_2) (\text{FIXED ratio it}) + (\beta_3) (\text{GROWTH it}) + (\beta_4) (\text{SIZE it}) + \mu \text{ it,}$$

Where b_0 = constant of the regression equation, β_1, β_2, β_3, β_4 = Coefficient of DEBT, Fixed ratio, GROWTH, and SIZE respectively.

4. Data Analysis and Discussion

First: in addition to descriptive statistics, we applied correlation model, specifically Pearson correlation to measure the degree of association between different variables under consideration. Second: we used Regression analysis to estimate the causal relationships between profitability variable as dependent one, and other chosen variables. We have used Pooled Ordinary Least Squares methods for analysis. For this purpose of analysis the E - views software version (7) was used to analyze financial data and especially in case of pooled data. In order to find out this relationship between different variables, first Pearson Correlation Coefficients are calculated. As the correlation shows the degree of relationship between dependent and independent Variables, It shows how much strong or weak the relationships between two variables are. Hence, the above data shows there is a positive weak relationship between return on assets (dependent variable), and growth (independent variable). Moreover, the

above number shows that there is a negative relationship moderate or weak between debt, fixed asset to total assets ratio, size and dependent variable. The signs are positive with respect to ROA and Growth indicating a positive relationship. However, the degrees of relationship vary among the other variables. "DEBT, FIXED ratio and SIZE", -0.1621, -0.0453 and -0.0012, which are -16.21%, -4.53%, and 0.012% respectively. The relationship with ROA is positive but weak with growth. ROA has inverse relationship with all these variables except growth, if DEBT ratio increased, the ROA decreased and if DEBT decreased, the ROA is respectively increased.

4.1 Regression Analysis

A test for multicollinearity was performed showed that regression model has the variance inflation factor (VIF) < 5, this is a tool to verify whether one independent variable has a high correlation with the remaining independent variables ranging between 1.061 and 1.111, which is less than 5 (Berenson & Others 2002), thereby demonstrating that no Multicollinearity exists between independent variables in the regression model, and tolerance coefficients is not very close to 0, model is considered to be free from multicollinearity problem (Gujarati, 1995). And Durbin-Watson statistic (1.253480) has been used in the model to test if there is autocorrelation of the first degree. Durbin-Watson statistics usually show no autocorrelation). The model has pretty good VIF and tolerance values. There are no multicollinearity problems and autocorrelation in the model and this shows soundness and reliability of the model.

We used the Debt ratio as a proxy for leverage; it shows a significant negative relationship with the dependent variable (profitability) , which means that, when leverage of the firm increases, it will adversely affect its profitability, the results of this regression indicate that the coefficient of DEBT ratio is negative and is highly significant at $\acute{\alpha}$. = 5%. It implies that the increase or decrease in accounts of leverage will affect profitability of the firm, which confirms our first alternative hypothesis that says "there *is a significant relationship between Leverage ratio and profitability of Jordanian industrial companies listed in ASE", Figure 1 plots the Average*, but this relationship has an inverse manner. In case of financial assets to total assets ratio, it has no significant relation with profitability. It reflects that if this ratio increases the operating profitability may decrease or not, this ratio has a negative coefficient with profitability, the coefficient is (-0.007435) which confirms our second null hypothesis that " *There is no significant relationship between fixed assets to total assets ratio and return on assets ", Figure 2 plots the average.*. Similarly changes in total assets between consecutive two years as proxy for growth of a company shows a significant positive relationship with profitability, which means that bigger growth in assets, have more profitability compared to firms of smaller growth. Which confirms our third alternative hypothesis "There *may exist a positive relationship between the firm's growth of Jordanian industrial companies and profitability", Figure 3 plots the average.* Similarly log of sales used as proxy for size of a company shows insignificant positive relationship with profitability which means that bigger size firms may have more profitability compared to firms of smaller size or not which confirm our fourth null hypothesis , *"There is no significant relationship between size of Jordanian industrial companies and profitability "* , Figure 4 plots the average. In case of financial assets to total assets ratio, it also has a significant negative relation with profitability. It reflects that if this ratio increases the operating profitability will decrease.

According to Table 04, the results of regression model may be shown mathematically as below:

$$\textbf{\textit{ROA it= (0.024364) – (0.172223) (DEBT ratio) – (0.007435) Fixed ratio + (0.022771) (Growth) + (0.003518) (SIZE) + µit}}$$

The adjusted $R^{(2)}$, also called the coefficient of multiple determinations, is the percent of the variance in the dependent explained uniquely or jointly by the independent variables and is 3.598%. The C is the constant, where the regression line intercepts the y axis, representing the amount the dependent y will be when all the independent variables are 0. Here C is 0.024364; the probability of the coefficient is not significant. The F statistic is used to test the significance of R. Overall; the model is significant as F-statistics is 3.547289 with Prob (F-statistic =0.007692. The results of regression model suggests that managers can increase the ROA by increasing the total assets of the company, and decreases the debt. The analysis of variance (ANOVA) tests are also significant at 0.002 and 0.001 for growth and debt; while for other independent variables are not significant as we see from the table 5 below.

4.2 Conclusions, Implications and Future Research

The regression analysis results show that Profitability (dependent variable) is positively related to firm size but is not significant. This finding is similar to the findings of Nguyen and Neelakantan [2006], Biger *et al.* [2008]. The profitability also positively related to growth opportunities of the Jordanian industrial companies. This finding is contradicted to the findings of Biger *et al.* [200]. However, negatively related to financial assets to total assets ratio. This finding is similar to the findings of Nguyen and Neelakantan [2006] but contradicts with the findings of Biger *et al.* [2008]. Moreover, Leverage is negatively related to profitability of the Jordanian industrial companies the findings contradict to Abor [2005], but similar to the findings of Biger *et al.* [2008], and

Afza and Hussain [2011].

The More generally, this paper marks a first attempt to empirically address the relationship between Financial leverage in form of (debt / total assets) ratio , Fixed assets / total assets ratio , growth , size and profitability. In interpreting the estimation results, it should be kept in mind that debt ratio has positive effect on profitability, while other variables have not any significant relationship with profitability .The current paper serves as an initial step, highlighting an important, if elementary, relationship, relevant to the regulation of companies. So it is concluded that debt ratio affect the profitability. There is only one limitation that the data is only of 10 years from 1995 – 2005 due to availability of data constraint and this study is limited to a sample of Jordanian industrial companies. Therefore, findings of this study could only be generalized to manufacturing firms similar to those that were included in this research. In addition, the sample size is small. Future research should investigate generalization of the findings beyond the Jordanian industrial companies and service sector.

To examine the relation between past profitability and financial leverage, Figure 2 plots the average.

To examine the relation between past profitability and financial fixed assets to total assets ratio, Figure 3 plots the average

To examine the relation between past profitability and growth, Figure 4 plots the average

To examine the relation between past profitability and size, Figure 5 plots the average.

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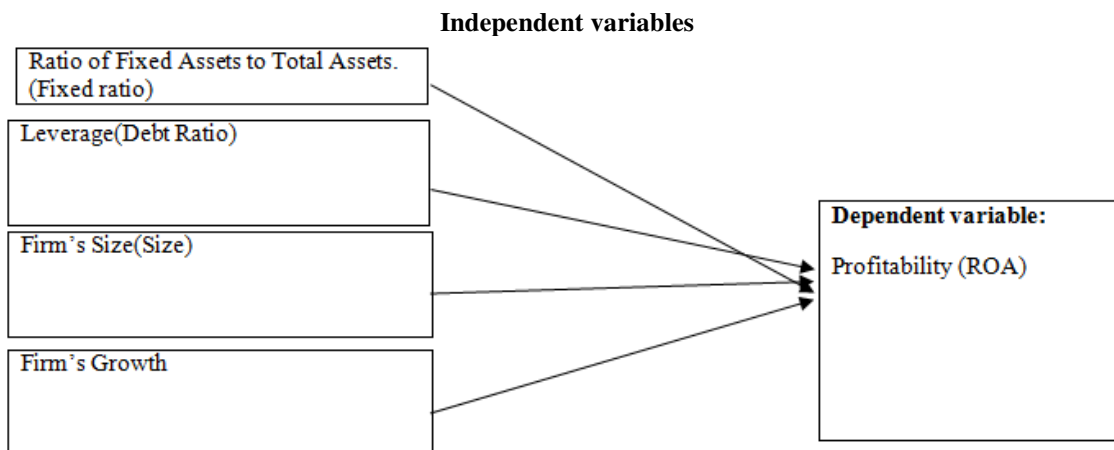
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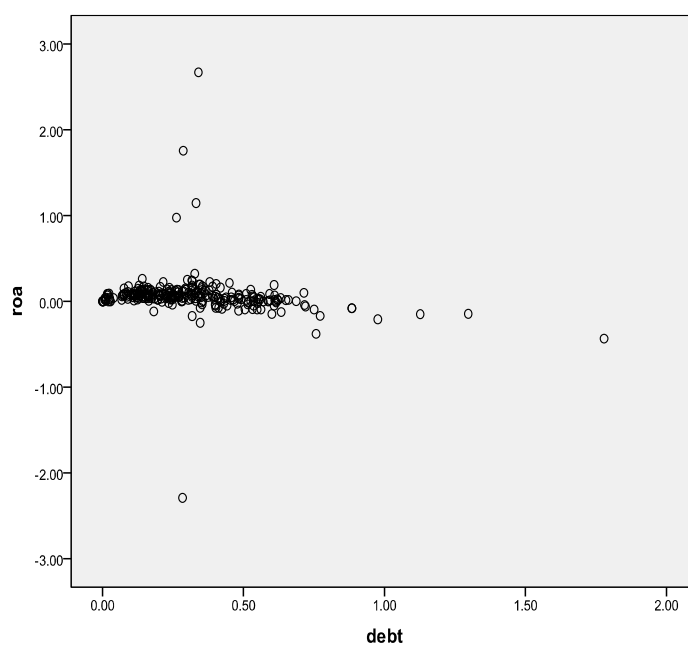

Figure 1. Variables of the Study
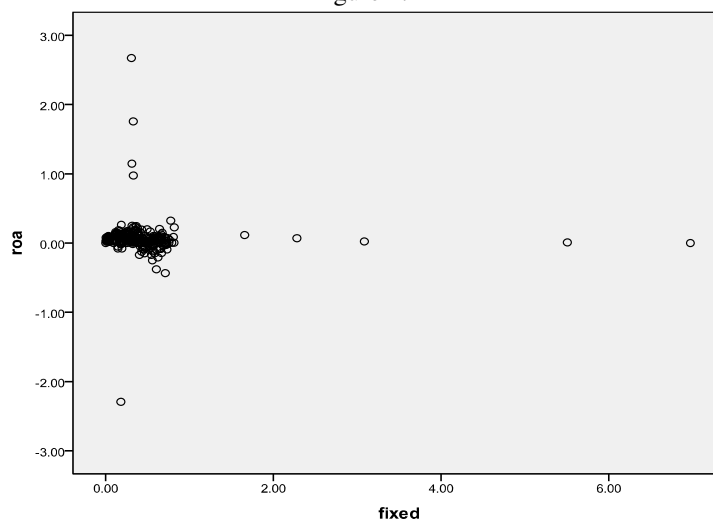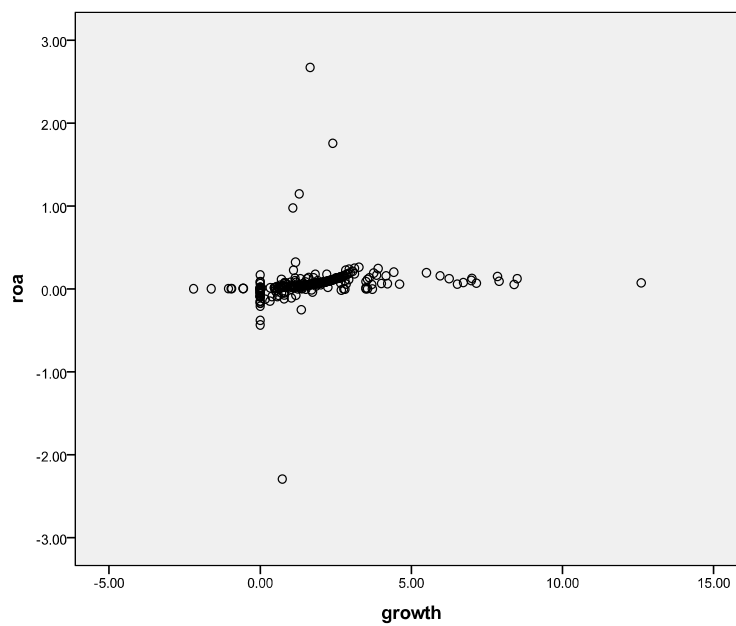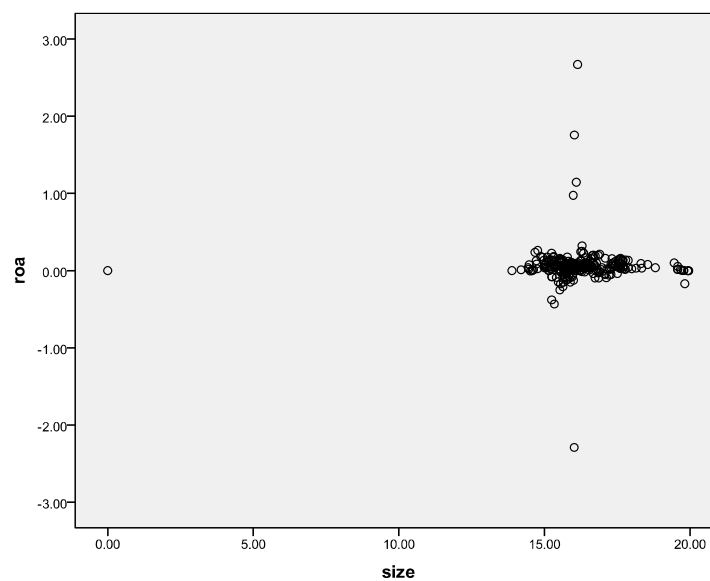

Figure 2.

Figure 3.

Figure 4.

Figure 5.

Table 1. Descriptive Statistics of Independent, and Dependent Variables (1995-2005)
Descriptive Statistics (N= Total observations=25*11=275.

	ROA	DEBT	FIXED	GROWTH	SIZE
Mean	0.064304	0.317530	0.431259	1.780221	16.28423
Median	0.054111	0.282563	0.346163	1.563841	16.15326
Maximum	2.670175	1.778332	6.972660	12.60000	19.95336
Minimum	-2.291768	0.000000	0.000000	-2.205096	0.000000
Std. Dev.	0.266736	0.224471	0.585801	1.730267	1.502354
Skewness	2.159975	1.764203	7.948346	2.065199	-4.141143
Kurtosis	63.42878	10.10209	79.88848	10.73699	52.30178
Jarque-Bera	41902.58	717.9864	70378.53	878.1842	28533.24
Probability	0.000000	0.000000	0.000000	0.000000	0.000000
Sum	17.61929	87.00329	118.1651	487.7807	4461.878
Sum Sq. Dev.	19.42342	13.75577	93.68332	817.3137	616.1792
Observations	**274**	**274**	**274**	**274**	**274**

Table 2. Proxy variables definition, predicted relationship and Abbreviation

Proxy Variables	Definitions	Predicted
Financial Leverage	Total Liabilities Divided by Total Assets	+/-
Firm Size (Ln sales)	Natural logarithm of firm sales	+/-
Growth	Change in total assets between two consecutive years	+/-
Profitability (ROA)	Earnings before interest, tax, depreciation divided by total	+/-
Collaterized Assets	Noncurrent Assets / Total Assets	+/-

Table 3. Pearson Bivariate Correlation Analysis

	ROA	DEBT	FIXED	GROWTH	SIZE
ROA	1				
DEBT	-0.1621	1			
FIXED	-0.0453	-0.0292	1		
GROWTH	0.1753	-0.1541	-0.2063	1	
SIZE	-0.0012	0.2583	-0.13681	0.0959	1

Table 4. Regression Estimates on Factors Influencing ROA

Dependent Variable: ROA			Method: Least Squares		
Date: 03/18/15 Time: 19:31					
Sample: 1 275					
Included observations: 274					
Variable	Coefficient	t-Statistic	Prob.	Tolerance.	VIF
C	0.024364	0.137140	0.8910		
DEBT	-0.172223	-2.313979	0.0214	.900	1.111
FIXED	-0.007435	-0.266779	0.7898	.943	1.061
GROWTH	0.022771	2.382828	0.0179	.919	1.088
SIZE	0.003518	0.317070	0.7514	.904	1.106
R-squared	0.050105	Mean dependent var		0.064304	
Adjusted R-squared	0.035980	S.D. dependent var		0.266736	
S.E. of regression	0.261893	Akaike info criterion		0.176321	
Sum squared resid	18.45021	Schwarz criterion		0.242254	
Log likelihood	-19.15597	Hannan-Quinn criter.		0.202785	
F-statistic	3.547289	Durbin-Watson stat		1.253480	
Prob(F-statistic)	0.007692				

Table 5. ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
size	Between Groups	426.593	268	1.592	.050	1.000
	Within Groups	191.131	6	31.855		
	Total	617.724	274			
fixed	Between Groups	55.802	268	.208	.033	1.000
	Within Groups	37.907	6	6.318		
	Total	93.708	274			
growth	Between Groups	815.962	267	3.056	13.565	.002
	Within Groups	1.352	6	.225		
	Total	817.314	273			
debt	Between Groups	13.774	268	.051	398.886	.000
	Within Groups	.001	6	.000		
	Total	13.775	274			

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