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Article

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Structural and market-related factors impacting profitability: A cross sectional study of listed companiesa

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ABSTRACT

The following paper aims at identifying whether several factors such as credit rating, liquidity, financial leverage, sales growth, company size, and average tax rates participate in determining the profitability of listed companies. This study adopted multiple regression analysis to measure the impact of the variables on profitability. The results have shown that the precedent variables explain 26.4% and 31.4% of ROA and ROE variations, respectively at a 5% significance level. Many researchers have deliberated about this subject; however, the uniqueness of this study is the assessment of credit ratings as a factor in explaining profitability of listed companies.

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1. Introduction

Profitability has been the subject material for several studies in the field of accounting and finance. In [Hermanson & Edward's \(2005\)](#) simple word, profitability is the organization's ability to generate income or not. According to [Hifza Malik \(2011\)](#), Profitability is a crucial component of determining performance and it is one of the most important objectives of companies. As such, profitability is considered as an indicator of progress, improvement and a factor reflecting sustainability of the company in the near future.

As the economic and market conditions around the world are putting operating and regulatory constraints, profitability indicators, for instance, are some of the required financial data for investors to have an idea about the companies' operations.

As for the creditors, profitability measures are important to shed light on the companies' ability to generate continuity of income to be able to convert them to liquid and pay their obligations as they come due. On another hand, profitability results are crucial as an indicator of achieving the required economic effectiveness ([Parkitra & Sadowska, 2011](#)). Hence, management would rely on these indicators to take improving or corrective actions.

The researchers, by understanding the importance of profitability in every aspect of business entities, aim at identifying some factors that determine the profitability with the final intent on improving it.

Objectives of the Study:

- (1) Identify the existence of a relationship between several financial factors with profitability.
- (2) Identify the impact of several financial factors on profitability.
- (3) Identify the existence of an impact of Credit Ratings on profitability.

More specifically, this paper will study the relationship between profitability and a series of factors with special attention to a new variable, and their impact on probability.

Hereby, the researchers attempt to address the following research questions:

RQ1: Is there a relationship between selected financial factors and profitability?

RQ2: What are the different fundamental financial factors that determine profitability?

RQ3: To what extent do liquidity and leverage impact profitability?

RQ4: Does credit ratings of companies have any impact on profitability of businesses?

1.1. Research gap

The researchers noticed from their literature readings that liquidity, leverage, and size have been popular variables in studying profitability of companies. However, very few are the research concerning credit ratings and their impact on profitability. Hence, this paper will shed light on this point and try to add to the literature and encourage many more researchers to pursue such topics.

The next section will discuss previous studies and formulate several hypotheses to be tested. Followed by the research methodology and the empirical results, the paper ends with a conclusion and recommendations.

2. Literature review

[Andreas Stierwald \(2009\)](#) has mentioned two opposing models in modern literature governing the changes in profitability. On one hand, there is the Structure Conduct-Performance (SCP) which implies that the market concentrations determine profitability. The other one is the Firm Effect Model which advocates internal actions affecting profitability. Stierwald has referred to firm level variables such as lagged profit, productivity level, and size as the main contributors of profitability.

[Sivathaasan, Tharanika, Sinthuja, and Hanitha \(2013\)](#) have identified capital structure, non-debt tax shield, working capital, growth rate and firm size as factors. They considered Return on Assets (ROA) and Return on Equity (ROE) as proxies for profitability and found out that capital structure and non-debt tax shield have positive and significant impact on profitability. Working Capital and firm size have no significant effect with positive relation while growth rate has a negative and no significant impact.

A similar study was done by [Camelia Burja \(2011\)](#) whereby she measured the profitability in terms of ROA. She considered Fixed Assets Ratio, Debt Ratio, Financial Leverage Ratio, Sales to Current Assets, Sales to Equity, Gross Margin Return on Investment and expenses revenue ratio as factors affecting profitability. She tested four models and the overall results show the existence of a strong positive impact with respect to the efficiency of inventories, Debt level, financial leverage, and efficiency of capitals.

On another perspective, [Parkitra and Sadowska \(2011\)](#) researched about the existence and magnitude of macroeconomic as well as internal factors affecting profitability, taking the polish enterprise as the basis of research. Several of the macroeconomic factors under testing were total population, and youth education; graduate of higher education institution showed influence however they were indecisive about the determinants of profitability.

Moving into a detailed research material, concerning credit ratings and profitability, defining what credit ratings is the starting point. As SEC's office of investor education and advocacy, "A credit rating is an assessment of an entity's ability to pay its financial obligations". [Credit rating](#) agencies are responsible for assessing this ability. Each agency issues different symbols, scales and have

different methods of calculation. However, all ratings range from “AAA” to the lowest “D”, divided between investment grades and non-investment grade. It is crucial to note that credit ratings reflect default risk and not other types of risk, such as market or liquidity risks.

A glimpse over the literature reveals that credit rating agencies rely somehow on performance measures like ROA, Tobin Q and stock return to assess the credit rating of a specific company (Singal, 2013). The literature includes studies on the impact of credit rating changes on the stock prices. Freitas and Minardi (2013) examined how the Latin American Market Stock prices change due to announcements of downgrades or upgrades of credit ratings. They found that as predicted, downgrades have more of a negative impact and that this impact extends to after the announcement. Another research about credit ratings’ impact is by Baek and Cursio (2015) where they addressed the magnitude of capital structure changes due to changes in credit ratings taking financial firms and utility companies as the basis of the study. The results show that financial and utility firms react differently than industrial firms as they adjust less.

The researchers noticed the lack of any previous study regarding the impact of changes in Credit Ratings on profitability of businesses. Several of the previous literature has studied the opposite relation which is the impact of profitability on credit ratings. The researchers believed that when a company’s rating is downgraded; the logical succession is an increase in cost of debt as such an increase in interest expenses, followed by a lower profit. Influenced by this idea, the researchers came up with the hypothesis of the impact of credit ratings on profitability.

Previous studies revealed that several researchers have tested the impact of liquidity ratios on profitability. For instance, Saleem and Rehman (2011) discussed how liquidity affects profitability by studying Pakistani Oil and Gas companies. The results showed that liquidity ratios (current ratio, quick ratio, liquid ratio) have a significant impact on ROA, however; a nonsignificant impact on ROE and ROI. Several researchers have issued conflicting results on whether the impact of liquidity is positive or negative.

For example, Elgely (2004) notions the impact to be a negative one whereas Padachi (2006) claims the impact is positive. Zygmunt (2013), after studying polish listed IT companies for the period 2003-2011, found out that if account payable collection period, receivable collection period, and inventory collection increase, profitability of polish listed companies would also increase. He also noted that sometimes the influence of liquidity is delayed. The researchers agree with Saleem & Rehman, Padachi, Elgely, and Zygmunt with respect to having liquidity as a determinant of profitability. However, they disagree with Elgely about the impact being a negative one and claim the positivity of such impact on profitability.

The continued review of the literature sheds light on the impact of financial leverage on firms’ profitability. Nawaz, Salman, and Shamsi (2015) performed an OLS regression using data from cement companies from Pakistan. They tested the relationship between financial leverage and profitability to see if the impact is negative and a significant one. Based on a regression analysis with ROA as the dependent variable and debt ratio as the independent one, the results confirmed the hypothesis that a high leverage results in lower profitability. Another researcher, Al-Shamaileh and Khanfar (2014) tested the hypothesis that there is no significant relationship between the cost of funding and profitability. Inspired by Nawaz, Salman, & Shami’s, the researchers anticipated a negative impact of leverage on profitability of firms.

Another interesting factor would be the effective tax rate and its impact on company performance. Neghina Laura and Dr. Georgeta (n.d.) tested this relationship by identifying ROA and ROE as dependent variables. The results came with an R^2 of 88% on the model and the hypothesis was confirmed that effective tax rate has a negative influence on profitability. Seconding Neghina & Dr. Georgeta’s claim, the researchers believe that effective tax rates have impact on profitability and probably this impact is a negative one. This notion is backed up by the fact that as Tax rates increase, net income drops. Thus, the researchers consider testing this concept.

An interesting point in the literature review was noticed about the size of companies on the profitability of the firms. There are conflicting and mixed results about the sign of the relationship. Some researchers claim a rapid growth lead to high profitability (MacMillan & Day, 1987) whereas others, Hoy (1992) claims that an increase in growth is negatively related with firm’s profitability.

A further interesting notion was Ninesh & Velnampy’s (2014) study claiming no relation between firm size and profitability. The researchers disagree about this result assuming that as the firm becomes larger; its ability to enter markets, its ability to negotiate better in contracts, and its ability to receive favourable loans enhances their performance. Thus, the researchers decided to test this concept as well (Table 1).

The study came up with the following hypotheses to test the relationship of several factors with profitability based on financial information from listed companies:

Statement 1: Credit rating and Profitability are related.

H_0 : There is a positive relationship between credit rating and Profitability.

H_a : There is not a positive relationship between credit rating and Profitability.

Statement 2: Liquidity and Profitability are related.

H_0 : There is a positive relationship between liquidity and Profitability.

H_a : There is not a positive relationship between Liquidity and Profitability.

Statement 3: Leverage and Profitability are related.

H_0 : There is a negative relationship between Leverage and Profitability.

Table 1 – Summary of literature review.

Name	Year	Variables	Impact/relation
Andreas Stierwald	2009	Size	Exists
Sivathaasan et al.	2013	Profitability	+
		Capital structure	+
		Non-debt tax shield	No impact
		Size	No Impact
		Working capital	–
Camilia Burja	2011	Growth rate	
		Profitability	+
		Fixed asset ratio	+
		Debt ratio	+
		Leverage	+
		Sales to current assets	+
		Sales to equity	
		Gross margin on investment	
Singal	2013	Credit rating	+
		Return on assets	+
		Tobin Q	+
		Stock return	
Freitas & Minardi	2013	Credit ratings on stock prices	+
Back & Cursio	2015	Credit ratings on capital structure	+
Saleem & Rehman	2011	Return on assets	+
		Current ratio	+
		Quick ratio	
Elgely	2004	Liquidity	–
Padachi	2006	Liquidity	+
Zygmunt	2013	Accounts payable period	+
		Days sales outstanding	+
Nawaz, Salman, & Shami	2015	Debt ratio	–
		Return on assets	
Al-shamaileh & Khanfer	2014	Cost of funding	Non
Naghina Laura & Dr. Georgeta	n.d.	Effective tax rates	–
		Return on assets	
		Return on equity	
MacMillan & Day	1987	Growth	+
Hoy	1992	Growth	–
Niresh & Velnampy	2014	Firm size	Non
		Profitability	

H_a: There is not a negative relationship between Leverage and Profitability.

Statement 4: Sales Growth and Profitability are related.

H₀: There is a positive relationship between Sales Growth Rate and Profitability.

H_a: There is not a positive relationship between Sales Growth and Profitability.

Statement 5: Average Tax rate and Profitability are related.

H₀: There is a negative relationship between average tax rate and Profitability.

H_a: There is not a negative relationship between average tax rate and Profitability.

Statement 6: Company size and Profitability are related.

H₀: There is a positive relationship between Company size and Profitability.

H_a: There is not a positive relationship between Company size and Profitability.

Statement 7: Different factors and their impact on profitability.

H₀: There is a significant impact of above factors on Profitability.

H_a: There is not a significant impact of the above factors on Profitability (Fig. 1).



Fig. 1 – Model summary.

3. Research methodology

The paper studies the factors influencing profitability with a new factor addressed, Credit Ratings, taking a sample from the target population of listed companies on the New York Stock Exchange (NYSE). The main reason for choosing NYSE is the availability of information and data, especially with respect to credit ratings. It was quite a hassle to find out ratings due to the high cost of the reports. The researchers were able to get a report composed of 119 listed companies with their ratings however, this number went down due to unavailability of data. The researchers ended up with only 94 companies with full set of data.

These companies were chosen based on convenience sampling with respect to availability of credit ratings.

Contrary to [Sivathaasan et al. \(2013\)](#), who adopted five years averages, this study uses a cross sectional look over the industries for the financial data of 2014/15. The financial data was collected from YahooFinance.com where data is provided by Standard & Poor's Capital IQ. As for the credit ratings, the rates were extracted from the [Morningstar Corporate Credit Rating's](#) latest public issue.

As the study aims at identifying factors impacting the profitability, the study uses Return on Equity (ROE) and Return on Assets (ROA) as proxies for profitability, following the steps of many previous researchers.

The study performed the following Ordinary Least Square (OLS) multiple regression model using IBM SPSS Version 20.

$$\text{Profitability}_{i,t(\text{ROE})} = \beta_0 + \beta_1 \text{CR} + \beta_2 \text{LR} + \beta_3 \text{DE} + \beta_4 \text{TR} + \beta_5 \text{G} + \beta_6 \text{S} + \varepsilon \quad \text{model1}$$

$$\text{Profitability}_{i,t(\text{ROA})} = \beta_0 + \beta_1 \text{CR} + \beta_2 \text{LR} + \beta_3 \text{DE} + \beta_4 \text{TR} + \beta_5 \text{G} + \beta_6 \text{S} + \varepsilon \quad \text{model2}$$

where ROE represents Return on Equity as a proxy for Profitability; ROA represents Return on Assets as proxy for Profitability; CR represents Credit Rating; LR represents Current Ratio as a proxy for liquidity; DE represents Debt-to-equity as a proxy for Leverage; TR represents Average Tax Rate; G represents Growth; S represents Total Assets as a proxy for Firm Size; ε for error.

The level of significance was set for 5% and the statistical test results were calculated at 2-tailed level of significance.

4. Descriptive results

Using SPSS software, the descriptive results of the collected data shows that the average ROE is 23.76%, its minimum is –50.28% while the maximum is 440.28%. As for ROA, the mean is 6.21%, the minimum is –11.24% and the maximum is 19.43%. Moving to

Table 2 – Descriptive results.

		ROE	ROA	Current Ratio	Debt-to-equity	Sales Growth	Tax Rate	Total Assets
N	Valid	101	103	98	95	102	100	102
	Missing	4	2	7	10	3	5	3
Mean		23.7628	6.2139	1.6620	165.2908	4.1549	26.8585	109.6173
Minimum		–50.28	–11.24	.35	10.48	–58.50	–87.00	2.19
Maximum		440.28	19.43	7.85	2774.28	88.20	65.18	2104.00

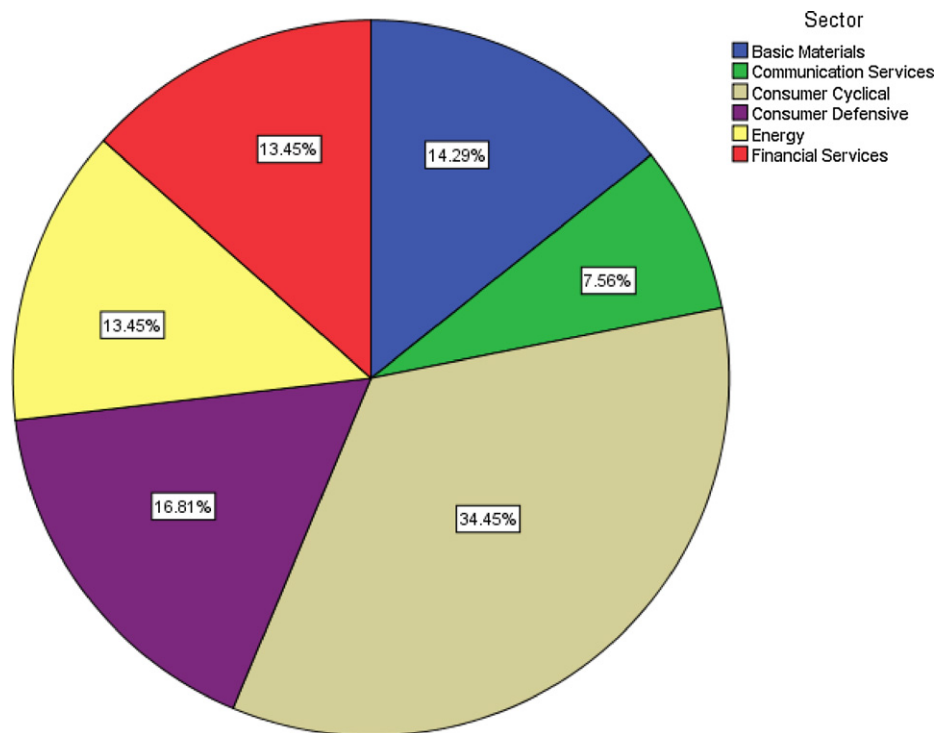


Fig. 2 – Distribution of data by sector.

Current Ratio, the minimum is 0.35, the maximum 7.85 while its mean is 1.66. As for Debt-to-equity, the mean is 165.29%, the minimum 10.48%, and its maximum 2774.28%. Next, Sales Growth has an average of 4.15%, a minimum of –58.5% and a maximum of 88.2%. As for the average tax rate, the mean is 26.86% with a minimum of –87% and a maximum of 65.18%. Finally, the mean Total Assets is \$109.62 million with a minimum of \$2.19 million and a maximum of \$2104 million (Table 2).

Fig. 2 shows the percentage of each sector under study by this paper. As it is clear the majority of companies under research are Consumer Cyclical goods such as Amazon.com Inc., Macy's Inc., Ford Motor Co, and Starbucks Corp. The second largest category is the Consumer Defensive goods. A selection of such companies is Coca-Cola Co, Diageo PLC, Kellogg Co. The third position is for Basic Materials which include Praxair Inc., Ecolab Inc., and Barrick Gold Corp. this category is followed by both Energy (Exxon Mobile) and Financial Services (Citigroup Inc., and AIG) Companies. Finally, the last category is Communication Services sector that includes companies like AT&T and Vodafone Group PLC.

5. Empirical results

There are several factors concerning the chosen variables that the researchers should check before running the regression model. For a start, the independent variables were tested for having a linear relationship with the dependent variables. The results of all except for credit ratings which is an ordinal scale came up affirming the linear relation.

The second step is to check for multicollinearity among the independent variables. The study ran two techniques: Tolerance and Variation of Inflation (VIF) as suggested by Sivathaasan et al. (2013). The results came higher than 0.2 for all the variables for Tolerance test and all had values less than 3 for VIF test. These results show that the study does not suggest a multicollinearity problem.

Moreover, a Durbin-Watson technique was conducted to test for independent observations and the results came back near 2 which reflect independence as shown in Tables 3 and 4.

Table 3 – Model 1 result.

Model summary^b

Model	Durbin-Watson
1	1.863 ^a

^a Predictors: (constant), total assets, tax rate, debt-to-equity, sales growth, current ratio, credit rating.

^b Dependent variable: ROE.

Table 4 – Model 2 result.**Model summary^b**

Model 1	Durbin-Watson 2.009 ^a
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^a Predictors: (constant), total assets, tax rate, debt-to-equity, sales growth, current ratio, credit rating.^b Dependent variable: ROA.**Table 5 – Correlation matrix.**

		ROE	ROA	Credit rating	Current ratio	Debt-to-equity	Sales growth	Tax rate	Total assets
ROE	Pearson Correlation	1	.451**	.117	-.088	.539**	-.063	.023	-.089
	Sig. (2-tailed)		.000	.242	.395	.000	.537	.825	.385
	N	101	100	101	95	94	98	96	98
ROA	Pearson Correlation	.451**	1	.172	-.064	.273**	.101	.160	-.286**
	Sig. (2-tailed)	.000		.082	.533	.008	.316	.115	.004
	N	100	103	103	98	93	100	98	100
Credit Rating	Pearson Correlation	.117	.172	1	-.114	.072	.059	-.029	.134
	Sig. (2-tailed)	.242	.082		.263	.488	.557	.774	.180
	N	101	103	105	98	95	102	100	102
Current Ratio	Pearson Correlation	-.088	-.064	-.114	1	-.109	.105	.110	-.134
	Sig. (2-tailed)	.395	.533	.263		.299	.313	.293	.194
	N	95	98	98	98	93	95	93	95
Debt-to-equity	Pearson Correlation	.539**	.273**	.072	-.109	1	-.053	.117	-.082
	Sig. (2-tailed)	.000	.008	.488	.299		.614	.270	.440
	N	94	93	95	93	95	92	90	92
Sales Growth	Pearson Correlation	-.063	.101	.059	.105	-.053	1	.125	-.079
	Sig. (2-tailed)	.537	.316	.557	.313	.614		.213	.427
	N	98	100	102	95	92	102	100	102
Tax Rate	Pearson Correlation	.023	.160	-.029	.110	.117	.125	1	-.014
	Sig. (2-tailed)	.825	.115	.774	.293	.270	.213		.890
	N	96	98	100	93	90	100	100	100
Total Assets	Pearson Correlation	-.089	-.286**	.134	-.134	-.082	-.079	-.014	1
	Sig. (2-tailed)	.385	.004	.180	.194	.440	.427	.890	
	N	98	100	102	95	92	102	100	102

** Correlation is significant at the 0.01 level (2-tailed).

5.1. Multiple regression analysis

The study conducted a Pearson Correlation Matrix whereby the relationship between the independent variables and the ROA as well as the relationship between the independent variables and ROE is measured. The results affirmed some of the hypotheses and some were rejected. Table 5 presents the correlation with regard to ROA and ROE.

Based on the correlation results, Debt-to-equity has a positive and significant relationship with ROE with a coefficient of 0.539 at $p=0.000$. Debt-to-equity also has a positive relationship and a significant one with ROA at $p=0.008$ with a coefficient of 0.273. Total Assets have a negative and a significant relationship with ROA at $p=0.004$ with a coefficient of -0.286 . ROA and ROE have a positive and a significant relationship at $p=0.000$ with a coefficient of 0.451. Finally, Credit Ratings have a positive relationship with ROA at $p=0.082$ significant at less than 10%.

Afterwards, the research ran a regression analysis with respect to ROA model; the independent variables weakly explain ($R^2=24.6\%$) of the variations in ROA. As for ROE model, the variables explain moderately ($R^2=31.6\%$) of the variations in ROE (Table 6).

The first model resulted in the following linear equation:

$ROE = 32.273 + 2.378CR - 2.014LR + 0.073DE - 0.151G + 0.164TR - 0.066TA + \epsilon$ whereby the only significant variable at less than 5% is the debt to equity (Table 7).

As for the second model,

$ROA = 10.681 + 0.562CR - 0.068LR + 0.003DE + 0.002G + 0.03TR - 0.017TA + \epsilon$

whereby Credit Rating, Debt to Equity, and Total Assets are significant at less than 5% significance.

Table 6 – Regression result ROA.Model summary^b

Model	R	R square	Adjusted R square	Std. error of the estimate
2	.495 ^a	.246	.194	4.22849

^a Predictors: (constant), total assets, tax rate, debt-to-equity, sales growth, current ratio, credit rating.^b Dependent variable: ROA.**Table 7 – Regression result ROE.**Model summary^b

Model	R	R square	Adjusted R square	Std. error of the estimate
1	.562 ^a	.316	.269	42.13176

^a Predictors: (constant), total assets, tax rate, debt-to-equity, sales growth, current ratio, credit rating.^b Dependent Variable: ROE.

With respect to the relationship between profitability and size, the researchers agree with Stierwald but disagree with Niresh & Velnampy, who claimed no relationship between size and profitability. The results disagree with Sivathaasan et al. about size having a positive impact as this study shows a negative sign. Moving to the results of leverage, the results agree with that of Burja. Both researches show a positive significant impact of leverage on profitability. However, this result conflicts with that of Nawaz, Salma, & Shami who claimed a negative one.

Carrying on with liquidity results, this research produces a similar result to that of Elgely and Saleem & Rehman claiming a negative impact but at the same time disagrees with Zygmunt and Padachi.

Surprisingly, this study revealed a contradictory result to that of Neghina Laura & Dr. Georgeta about the impact of effective tax rate. The research revealed a positive impact contrary to others who claim a negative one. Moving forwards to the next factor, the results of this test agrees with MacMillan & Day about the impact of growth being a positive one. At the same instance, it contradicts with the work of Hoy who claimed a negative one.

Finally, with respect to the new variable under study, Credit Ratings, the results agree with the study of Singal about the existence of a relationship between credit ratings and profitability. Most importantly, the major finding of this study is the positive significant impact of credit ratings on profitability. This is the actual contribution to the literature.

As such, the results did not reject the null hypothesis of credit ratings as the two models as well as the correlation between profitability and credit ratings came back positive; however, an insignificant one at $\alpha=5\%$. The paper rejects the null hypothesis of liquidity since the relationship is a not a positive one. The results also reject the null hypothesis for leverage as there is a positive relationship between leverage and profitability. The null hypothesis for average tax is also rejected since there is a positive relationship between tax rates and profitability. The models also rejected the null hypothesis for size, as the relationship is a negative and significant one at less than 1% significance level. As for the relationship between growth rate and profitability, the models were indecisive in their assessment. Finally, the null hypothesis regarding the impact of all factors being significant is also rejected as all the factors do not have significant impact on profitability, only leverage and size have a significant impact less than 1%.

6. Conclusion

The aim of this paper was to examine empirically the relationship between several factors and profitability of selected companies, listed on the NYSE for the year 2014–2015 by using multiple regression analysis. With an R^2 of 31.6% and 24.6%, the researchers were able to identify the significant positive impact of Credit Ratings and leverage on Profitability as well as the significant negative impact of firm size.

The paper has confirmed several other researchers' claims and refuted others. However, this paper's major contribution is linking Credit Ratings to the profitability and to shed light over its positive relationship.

7. Limitations

The researchers acknowledged the existence of several technical limitations with respect to the relatively low number of companies selected and the fact that the sampling was a non-probability one based on convenience and judgement. Another limitation was the collected data which was extracted from yahooFinance.com and was not calculated by the researchers using uniform method. Finally, having access to more data regarding credit rates could enhance the quality and authenticity of the results.

Conflict of interest

None declared.

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