THE RELATIONSHIP BETWEEN THE RETURN ON EQUITY (ROE) AND THE CAPITAL STRUCTURE OF THE JORDANIAN PUBLIC SHAREHOLDING INDUSTRIAL COMPANIES

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ABSTRACT

This study aims at verifying the impact of the capital structure on the profitability in Jordanian industrial joint-stock firms, and how these companies managed their capitals through the period from 2006 to 2015. The methodology of this study relied on the descriptive approach to analyze and classify the available data using the multi regression analysis. The sample of the study included the Dar Al Dawa Development and Investment Company, and the Hayat Pharmaceutical Industries Company. The results of this study show that there are statistically significant effects at the significance level (0.05. = α ≤ 0.0) of the capital structure (debt) on the return on equity (ROE) in the Jordanian industrial shareholding companies. Descriptive statistics indicate that the financial leverage (FL) constitutes about 51% of the capital structure in the aforementioned companies, with the short-term financial leverage being the largest component of the financial leverage (FL). It is worth noting that the leverage ratio was almost constant during the study period (the standard deviation ratio was 0,113). As shown by the study results, the rate of interpretation of the independent variables on the dependent variable was 85% (Adjusted R2). It has been also noticed that the relationship between the capital structure (indebtedness) and the profitability (ROE) is positive, i.e. there is a statistical significance of financial leverage (FL) on the profitability index in the studied companies. Likewise, there is a statistically significant effect of other independent variables (except for the asset turnover ratio) on the profitability index.

Keywords: Capital Structure, Profitability, Multiple Linear Regressions, Financial Ratios.

INTRODUCTION

Profit maximization is one of the strategic objectives of firms. Thus, it is a result of their investment and financial decisions, where the endeavor is always to align the organizational behavior with such decisions (Block & Hirt 1994).

One of the important decisions is choosing the capital structure and determining the appropriate mix of sources of funds. In other words, finding a capital structure that will increase the profit ratio. Hence, the effect of this structure on the profitability of the firm can be measured (Ross et al. 1996).

The puzzle of the capital structure continues to be of interest to many financial and economic policymakers and researchers, especially with regard to business firms. The capital structure fluctuates between equity and debt in order to achieve a reduction in the cost of capital

for the firm regardless of the sector or industry to which it belongs, and this cost influences the decision to accept the investment (or project) and its overall profitability (Watson and Head 2007).

Trade-off theories related to the capital structure assume that firms choose the level of debt in order to achieve a balance between the benefits of the tax rate with the costs of future liquidity risk and the current lack of financial flexibility. Although these theories are easy to apply, they have received reactions in real-life applications.

Trade-off theories may coincide with the abstract fact that firms with lower volatility and firms with assets have greater financial leverage, but Graham and Leary argue that these theories failed. The leverage appears to be too low for the theoretical expectations, whereas, the high variance in the leverage ratio stems mainly from the variance in return on stocks. The most controversial evidence is that the profitable firm has low financial leverage, though it is less likely to be exposed to financial hardships (Graham and Leary 2011).

As reported by (Myers 1993; Strebulaev 2007), the inverse relationship between profitability and financial leverage represents a telling evidence of the trade-off theory.

LITERATURE REVIEW

DeAngelo et al. (2011), Frank & Goyal (2012) concluded that profitability is what determines the issuance of debt and the decrease in equity. Kinsman and Newman (1999) also mentioned that the most effective way of studying the level of debt is to thoroughly investigate it in relation to the shareholders' prosperity. The relationship between the capital structure of the industrial sector companies listed on the Iraq Stock Exchange and the profitability represented by the return on assets (ROA) was examined by Stryckova (2017). She found that there is no relationship between the debt ratio (financial leverage) and the return on assets (ROA).

Likewise in Chadha & Sharma (2016), they studied the impact of the financing structure on the profitability of public shareholding companies and on their policy in the distribution of profits (earnings per share), the results of the study showed that there is no relationship between the capital structure and its profitability.

Nasimi & Nasimi (2018) studied the effect of capital structure on firm's profitability found that there is a positive relationship between the size and growth of the company and the cost of debt, cash, and capital structure; and the existence of a negative relationship between the liquidity of the company and the capital structure.

Shubita & Alsawalha (2012) checked the relationship between Capital Structure and Profitability and found that there is a weak trend between leverage (FL) profitability. The study also showed an effect of some factors on the capital structure as measured by financial leverage (FL).

The study conducted by Nassar (2016) on the effect of capital structure on the profitability and the value of firms showed a negative relationship between the profitability of the firm and the capital structure; thus, firms should use self-financing for their investments, as he considered this to be more profitable for them, he also found a positive relationship between the firm value and the capital structure.

The current study experimentally proposes that changes in the capital structure (debt) as an external factor to thoroughly investigate the relationship between the capital structure and the financial leverage (FL).

This study aims at reviewing the determinants of capital in Jordanian firms, and how the choice of debt level (financial leverage) affects the return of equity (ROE) of the firm.

METHODOLOGY

This study relies on the data of the public joint-stock industrial firms listed on the Amman Stock Exchange from 2006 to 2015. The study sample consists of two large companies: the Dar Al Dawa Development and Investment Company, and the Hayat Pharmaceutical Industries Company. The experimental framework (implementation) is the selective examination of the relationship between the capital structure (financial leverage) and the return on equity (ROE). The following multiple linear regression equation is required, which contains the independent variables that are expected to affect the dependent variable:

$$ROE = B1(\quad 1) + B2(\quad 2) + B3(\quad 3) + B4(\quad 4) + B5(\quad 5) + U$$

Where B1 is the practical regression coefficients, and where U represents the unobserved variables.

 1= the financial leverage ratio
 2= the working capital turnover ratio
 3= the asset growth rate
 4= the operating cash flow ratio
 5= the profit margin ratio

The financial leverage (FL) ratio expresses the fixed costs incurred by the company in order to increase the level of income. These fixed costs result from incorporating borrowed money (debt) into the capital structure, and the requisites of paying periodic interest payments to creditors.

The asset growth rate is the expected growth rate for the firm through several indicators:

"The percentage of growth in the number of employees, the percentage of growth in the company's sales, and the percentage of growth in total asset, or the ratio of capital expenditures to total asset, or the ratio of research and development expenses to total sale, or the ratio of firm's book value to its market value. Yet, the current study considers the growth percentage as the rate of growth of the firm's assets."

As for the operating cash flow ratio, it refers to the cash flow volatility generated from operating activities to cover the firm's current liabilities.

The profit margin ratio refers to the profit before interest and taxes to sale. The working capital turnover ratio provides a balance of the production activity performance with the efficiency of the sales activity performance, where the higher rate of working capital turnover is an indication of the balance of the efficiency of the production activity and the efficiency of the performance of the selling activity. However, if the rate of the working capital turnover decreased, there would be a need for more additional financing from external sources of financing (debt).

In order to apply the multiple linear regression equation and testing the study hypotheses (the main hypothesis and the sub-hypotheses), SPSS was used in the analysis process. Percentages, averages, and standard deviation were used to identify the characteristics of the studied samples.

The null hypothesis states that all the variants are dummy, and it is equal to zero.

The Major hypothesis: there is no statistical significance at the significance level (0.05. = a≤.) of the capital structure on the return on equity (ROE) in the *Industrial Jordanian Stock Companies*. Likewise, there is no statistical significance for: the rate of working capital turnover,

asset growth rate, operating cash flow ratio, and the profit margin ratio on return on equity (ROE) in the *Jordanian Industrial Shareholding Companies*, and at the significance level (0.05. =a ≤ 0.0).

Presenting Results and Testing Hypotheses

A descriptive statistical method was used to analyze the data of the companies covered in the study, statistical measures such as the standard deviation and the mean of the study variables were used, and the study reached the following results:

Table 1
ANALYSIS OF FINANCIAL RATIOS (2006 -2015)

Firm	Variable	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Arithmetic Average	Standard Deviation
Dar-Al-Dawa Development and Investment	Return on Equity	13.99	6.66	7.24	11.25	15.43	10.87	7.65	9.49	11.6	7.45	10.163	3.00143
	Financial Leverage Ratio	1.78	1.88	1.73	1.65	1.68	1.77	1.89	1.97	1.92	1.68	1.795	0.11306
	Asset Turnover Rate	0.46	0.54	0.60	0.50	0.46	0.45	0.49	0.49	0.69	0.68	0.536	0.09009
	Asset Growth Rate	0.09	0.071	0.041	0.062	0.12	0.097	-0.03	0.173	0.01-	0.086-	0.0334	0.05960
	Operating Cash Flow Ratio	0.083	0.198	0.037	0.045	0.18	0.095	0.40	-0.05	0.16	0.53	0.1588	017389
	Profit Margin Ratio	0.126	0.088	0.143	0.136	0.198	-0.14	0.084	0.093	0.087	0.067	0.0714	0.06191
Hayat Pharmaceutical Industries	Return on Equity	13.57	9.48	8.33	12.16	14.68	15.08	14.04	15.15	16.15	14.28	13.328	2.49807
	Financial Leverage Ratio	1.09	1.19	1.02	1.16	1.14	1.46	1.13	1.12	1.15	1.14	1.16	0.11489
	Asset Turnover Rate	0.49	0.62	0.59	0.66	0.58	0.62	0.61	0.66	0.64	0.58	0.605	0.04994
	Asset Growth Rate	0.063	0.026	0.016-	0.013	0.009-	0.058	0.043	0.074	0.14	0.079	0.0471	0.04313
	Operating Cash Flow Ratio	0.35	0.47	0.38	0.33	0.48	0.87	1.2	2.02	0.92	1.03	0.805	0.53035
	Profit Margin Ratio	0.24	0.201	0.23	0.19	0.13	0.21	0.203	0.204	0.22	0.21	0.2038	0.02978

*The Table was based on the data published in the Amman Stock Exchange

Table 1 demonstrates the descriptive statistics of the sample variables, where the arithmetic average of the return on equity percentage of the Dar Al Dawa Development and Investment Company is (10.163), and the standard deviation is (3.00143). The highest rate of return on equity in the company (15.43 %) was in 2010. The lowest percentage of this return was (6.66) in 2007.

There is a fluctuation in the return on equity resulting from the company's use of external financing (debt). As for the financial leverage ratio, it witnessed a constant rate during the study period, the highest value was in 2013 as it reached (1.97 %). The lowest value during the study period was in 2004, as it reached (1.65 %), with an arithmetic mean of (1.795), and a standard deviation of (0.11306).

The financial leverage ratio is greater than one, this is an indication that external financing has had a significant impact on shareholders' rights. Financial leverage indicates that a decrease in the profit margin ratio will lead to a decrease in the return on shareholders' equity, which declined during the study period.

As for the asset turnover rate, it fluctuated during the study period, as it was closer to one and with an arithmetic mean reached (0.536) and a standard deviation (0.09009). As for the rate of growth of assets, it decreased during the same period, it was (0.09) in 2006, and decreased to (-0.086) in 2015, with an arithmetic mean of (0.0334) and a standard deviation of (0.05960). When examining the operating cash flow ratio, it fluctuated between positive and negative, plus a decline in its percentage due to growing short-term debt, and the arithmetic mean has reached (0.1588), and the standard deviation has reached (0.17389). As for the profit margin ratio, it was at its highest in 2010, reaching (0.198), and for its lowest value, it was in 2011, it reached (-0.14), As a general trend for this year, there is a decline during the study period, the arithmetic mean has reached (0.0715), and the standard deviation has reached (0.06191).

For the Hayat Pharmaceutical Industries, the highest rate of return on equity was in 2014, as it reached (16.15), and the lowest rate was in 2008, as it reached (8.55), with an arithmetic mean of (13.328), and a standard deviation of (2.49807). As for the financial leverage ratio, it has witnessed relative stability, with an arithmetic mean of (1.16), and a standard deviation of (0.11489). As for the asset turnover rate, the arithmetic mean for the study period was (0.605) with a standard deviation of (0.04994).

As for the asset growth rate, it was fluctuating between positive and negative during the study period, the arithmetic mean for this year was (0.0471), and the standard deviation was (0.04313). When examining the operating cash flow ratio, its highest rate was in 2013, as it reached (2.02), and the lowest rate was in 2009, as it reached (0.33), this illustrates the fluctuation in this year. For the arithmetic mean of it, it reached (0.805), with a standard deviation of (0.53035).

The profit margin ratio was at its highest in 2006, as it reached (0.24), and for its lowest value, it was (0.13) in 2014. It was distinguished by a kind of relative stability, with an arithmetic mean of (0.2038) and a standard deviation of (0.02978).

It should be noted that the stability of the data was verified, whereas a model whose equations are not constant will result in an error, it was also confirmed that there were no multiple correlations between the independent variables before testing hypotheses.

Hypotheses Testing

Major Hypothesis: There is no statistical significance at the significance level (0.05. =a ≤ 0.0) of the capital structure on the return on equity (ROE) in the Industrial Jordanian Public Joint-Stock Companies.

To test the study hypothesis, multiple linear regression was tested to find out the presence of a statistical significance at the significance level (0.05 = a ≤ 0.0) of the capital (debt) structure on return on equity in the *Industrial Jordanian Public Joint-Stock Companies.*

Table 2 MODEL STRENGTH TEST				
Std. Error of the estimate	**Adjusted R2**	**R2**	**R**	**Model**
0.111908	0.856	0.943	0.971	1

A. Predictors: (constant), ROE

B. Dependent Variables: financial leverage ratio, assets turnover ratio, assets growth ratio, CFO ratio, profit margin ratio.

Model Strength Test: The strength of the model was tested to ensure that there was a relationship between the dependent variable and the independent variables (Table 2).

It is noticed from Table 2 that the correlation coefficient between the dependent variable and the independent variable is (0.971) and the value of R2 reached (0.943). As for adjusted R2 has reached (0.856) that means the change 85.6% in return on equity of the aforementioned firms is determined by the independent variables. The Residual compatibility (14.4%) is due to other factors.

The Overall Significance Test of the Linear Regression Model

Table 3 demonstrates the results of the analysis of variance (ANOVA) to test the significance of multiple linear regression models which aims to identify the explanatory power of the relationship model between independent variables and return on equity (ROE) through the (F) static.

Table 3 ANOVA					
Model	**Sum of Squares**	**DF**	**Mean Square**	**F**	**SIG.**
1 Regression	0.930	5	0.155	10.928	0.018 a
Residual	0.075	4			
Total	0.987	9	0.014		

A. Predictors: (constant), Equity ratio

B. Independent Variables: financial leverage ratio, assets turnover ratio, operating cash flow ratio, assets growth ratio, profit margin ratio.

It is noticed from Table 3 that there is a highly significant degree of (F) test estimates at (10.928), and at the significance level (0.018), which is less than the significance level (0.05. = a≤0.0). Therefore, the null hypothesis was rejected, and the alternative hypothesis was accepted, where there is a statistical significance at the significance level (0.05. =a≤0.0), for independent variables on return on equity in the *Industrial Jordanian Public Joint-Stock Companies.*

Sub-Hypotheses Tests

The first Sub-Hypothesis

There is no statistically significant effect at the level of significance (0.05. =a≤.) of the financial leverage ratio on return on equity in the *Industrial Jordanian Public Joint-Stock Companies*. The relationship between the independent variable (financial leverage) and the dependent variable (return on equity) has been tested, where the value of the regression coefficient and statistical tests as shown in Table 4.

Table 4 VALUES OF THE REGRESSION COEFFICIENTS (THE FIRST SUB HYPOTHESIS)					
Model	**Unstandardized Coefficients**		**Standardized Coefficients**	**T**	**SIG.**
	B	STD. Error	Beta		
1 Constant	18.263	2.852	0.483	6.403	0.000
ROE	4.411	1.883		2.343	0.031

A. Dependent variables: financial leverage ratio

It is noticed from Table 4 a presence of a statistical significance, where the calculated (t) value is (2.343), it is a higher value than its tabular value, which reached (1.297), on statistical significance (0.031), and it is less than (0.05). Therefore, the null hypothesis was rejected, and the alternative hypothesis was accepted, where there is a statistical significance at the significance level (0.05. = a≤.), for financial leverage ratio on return on equity in the *Industrial Jordanian Public Joint-Stock Companies*.

The Second Sub-Hypothesis

There is no statistical significance for the asset turnover index on the return on equity in the *Industrial Jordanian Public Joint-Stock Companies*. The result of testing the relationship between the independent variable (asset turnover) and the dependent variable (return on equity) appears in Table 5.

Table 5 VALUES OF THE COEFFICIENT NUMBERS (THE SECOND SUB HYPOTHESIS)					
Model	**Unstandardized Coefficients**		**Standardized Coefficients**	**T**	**SIG.**
	B	STD. Error	Beta		
1 Constant ROE	10.891	5.373	0.38	2.027	0.59
	1.498	9.333		0.161	0.974

A. Dependent variable: assets turnover ratio

It is noticed from Table 5 that there is no statistical significance, where the calculated (t) value is (0.161), it is a lower value than its tabular value, which reached (1.986), and on statistical significance (0.874), and it is higher than (0.05). Therefore, the null hypothesis was accepted, and the alternative hypothesis was rejected, where there is no statistical significance at the level of significance (0.05. = a≤.), for assets turnover ratio on return on equity in the *Industrial Jordanian Public Joint-Stock Companies.*

The Third Sub-Hypothesis

There is no statistical significance for the asset growth ratio on the return on equity (ROE) in the *Industrial Jordanian Public Joint-Stock Companies*, and to test the relationship between the independent variable (asset growth ratio) and the dependent variable (return on equity), the value of the regression coefficient and the statistical tests appear in Table 6.

Table 6 VALUES OF PARTIAL REGRESSION COEFFICIENTS (THE THIRD SUB HYPOTHESIS)					
Model	**Unstandardized Coefficients**		**Standardized Coefficients**	**T**	**SIG.**
	B	STD. Error	Beta		
1 Constant	0.022	0.010	0.985	2.283	0.107
ROE	0.011	0.001		9.879	0.002

A. Dependent variable: assets growth ratio

It is noticed from Table 6 that there is a statistical significance between the dependent variable (return on equity) and the independent variable (assets growth ratio), where the calculated (t) value is (9.8791), it is a higher value than its tabular value, which reached (7.254), and on statistical significance (0.002), and it is lower than (0.05). Therefore, the null hypothesis was rejected, and the alternative hypothesis was accepted, where there is a statistical significance

at the significance level (0.05. = a≤0.0), for assets growth ratio on return on equity (ROE) in the *Industrial Jordanian Public Joint-Stock Companies*.

The Fourth Sub-Hypothesis

There is no statistical significance for the cash from operation (CFO) ratio on the return on equity, and to test the relationship between the two variables, the values of the regression coefficients and statistical tests are shown in Table 7.

Model	Unstandardized Coefficients		Standardized Coefficients	T	SIG.
	B	STD. Error	Beta		
1 Constant ROE	10.251	0.883	0.493	11.608	0.000
	3.072	1.2777		2.406	0.027

Table 7
VALUES OF REGRESSION COEFFICIENTS (THE THIRD SUB HYPOTHESIS)

A. Dependent variable: cash from operation (CFO) ratio

It is noticed from Table 7 that there is a statistical significance between the dependent variable (return on equity) and the independent variable (cash from operation ratio), where the calculated (t) value is (2.406), it is a higher value than its tabular value, which reached (832%), and on statistical significance (0.027), and it is lower than (0.05). Therefore, the null hypothesis was rejected, and the alternative hypothesis was accepted, where there is a statistically significant effect at the significance level (0.05. =a≤.), for cash from operation ratio on return on equity (ROE).

The Fifth Sub-Hypothesis

There is no statistical significance for the profitability margin ratio on the return on equity (ROE), and to test the relationship between the independent variable (profitability margin ratio) and the dependent variable (return on equity), the value of the regression coefficient and the statistical tests appears in Table 8.

Model	Unstandardized Coefficients		Standardized Coefficients	T	SIG.
	B	STD. Error	Beta		
1 Constant ROE	0.228	1.382	0.554	5.952	0.000
	23.640	8.368		2.825	0.011

Table 8
VALUES OF REGRESSION COEFFICIENTS (THE FIFTH SUB HYPOTHESIS)

A. Dependent variable: profit margin ratio

It is noticed from Table 8 that there is a statistical significance, where the calculated (t) value is (2.825), it is a higher value than its tabular value, which reached (578%), and on statistical significance (0.011), and it is lower than (0.05). Therefore, the null hypothesis was rejected, and the alternative hypothesis was accepted, where there is a statistical significance at the significance level (0.05. =a≤0.0), for cash profitability margin ratio on return on equity (ROE), in the *Industrial Jordanian Public Joint-Stock Companies*.

RESULTS AND RECOMMENDATIONS

Results

1. There is a direct relationship between the independent variables and the dependent variable.

2. There is a statistical significance on the capital structure (debt, financial leverage) in the Industrial Jordanian Public Joint-Stock Companies.

3. There is no statistical significance for asset turnover on return on equity (ROE) in the *Industrial Jordanian Public Joint-Stock Companies*.

4. There is a statistical significance for asset growth ratio on return on equity (ROE) in the *Industrial Jordanian Public Joint-Stock Companies*.

5. There is a statistical significance for cash from operation (CFO) ratio on return on equity (ROE) in the *Industrial Jordanian Public Joint-Stock Companies*.

6. There is a statistical significance for cash from operation (CFO) ratio on return on equity (ROE) in the *Industrial Jordanian Public Joint-Stock Companies*.

7. There is a statistical significance at the level of significance for profit margin ratio on return on equity (ROE) in the *Industrial Jordanian Public Joint-Stock Companies*.

Recommendations

1. The necessity for the management of public shareholding industrial companies subjected by the study to arrange their financial needs according to priority (internal financing and then resorting to external financing).

2. The necessity to rely on models to determine the capital structure in the Industrial Public Joint-Stock Companies.

3. It is possible to rely on external sources of financing (debt) that are available at low cost from local banks and use them efficiently, which will be beneficial for the firms (there is no harm in debt if used optimally).

4. Firms (study sample) can benefit from the results of this study to improve their financial performance.

5. Conducting further studies and capitalizing on the ideas provided by capital structure explanatory studies.

6. It is possible to extend the application of the model adopted in this study to other industrial companies in order to strengthen and popularize the hypotheses of this study.

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