

An Empirical Investigation of the Trade-Off Theory: Evidence from Jordan

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Abstract

This study aims to test if the Jordanian industrial listed firms follow the trade-off theory in their funding needs strategy during the period 2000-2014. Utilizing data from a sample of the Jordanian industrial firms, the results show that the inverse relationship between profitability and leverage result is not consistent with the trade-off theory, indicating that more profitable Jordanian manufacturing firms tend to issue more equity and less debt to finance their need of funds. The direct relationship result between firms' size and leverage is in line with the trade-off theory, indicating that large firms tend to finance their needs of fund through issuing debt rather than equity. As for the growth leverage relation, the result supports the trade-off theory, but the relation is not statistically significant. In summary, The Jordanian manufacturing firms follow the trade-off theory partially, and the industrial sector have an impact on the financing decision.

Keywords: trade-off theory, Jordan

1. Introduction

The trade-off theory of capital structure is based on the idea that companies choose between funding through debt or equity by balancing between costs and benefits of each source. The original version of this theory goes back to Kraus and Litzenberger (1973), who took into account the balance between the costs of bankruptcy and the benefits of the tax shield resulting from financing through debt. It is often looked at the trade-off theory as competition to the theory of pecking order theory.

The most important goal of this theory lies in the interpretation of reality that companies finance their needs of money through a combination of debt and equity funds without complete dependence on a single source. Under the theory that there is an advantage of financing through debt which is the tax shield, and there is a cost of financing through debt which is the interest paid and the costs of financial distress of the possibility of bankruptcy of the company. Within this fact, companies seek to reach to the optimal capital structure by balancing between the benefits and the costs of the each source of funds.

This study aims to test the existence of the trade-off theory in the industrial sector of Amman stock Exchange (ASE) for the period 2000-2014, as it seeks to find if Jordanian industrial listed firms follow trade-off theory in their funding needs strategy during the period 2000-2014.

Thus, the hypothesis that the study seeks to test can be formulated as follows:

H01: Jordanian industrial companies do not follow the trade-off theory in their financing decision.

H02: There is no statistically significant difference between different industrial sectors on relying on debt to finance the companies' need of money.

The rest of the study is prearranged as follows: the second section presents the previous literature review related to the study, third section presents the data and variables of the study, methodology in the fourth section of the study and the fifth section presents the experimental results and conclusions of the study.

2. Literature Review

Prior research on static trade-off theory reached mixed results. On the one hand, study concluded that the optimal capital structure is not significant. Many studies for instance, Titman and Wessels (1988), Rajan and Zingales (1995), and Fama and French (2002) confirmed that the most profitable firms more likely to borrow less. This

result is not consistent with the trade-off theory expectations that the most profitable firms should borrow more to take advantage of the debt's tax advantage. Graham (2000) found that the profitability firms are financing using debt conservatively. Microsoft Company is the most obvious example of these studies as the company's profitability is considered very high and has a zero-debt policy.

On the other hand, lots of researches were consistent with the trade-off theory and confirm the role of optimal debt ratio (e.g. Hovakimian, Opler, & Titman, 2001; Korajczyk & Levy, 2003; Hovakimian, 2004; Hovakimian & Tehranian, 2004). Frank and Goyal (2004) supported the trade-off theory by investigating relative importance of 39 factors. Welch, 2004 concluded that Firms on their optimal debt ratio do not compensate the effect of stock returns actively, and finds that prior stock returns are the main determinant of market leverage. Flannery and Rangan (2006) disagree with Welch (2004) by finding the impact of firms' prior stock price movements. Often, the companies buy back its shares not to apply a certain financial policy, but rather the desire of the company to approach the optimal debt ratio, (Leary & Roberts, 2005; Hovakimian, 2006). Strebulaev (2004), and Hennessy and Whited (2004) tried to reconcile the conflicting results of the trade-off theory in a changing framework.

3. The Data and Variables

3.1 Data

The data that were used in this study are consisted of the existing data in the financial statements of the industrial sample companies, and were extracted from the ASE official website for the time horizon 2000-2014 resulting in 975 firm-year observations.

3.2 Variables

3.2.1 Dependent Variable

Financial leverage, expressed as the total debt ratio which is the proxy of the trade-off theory, is a ratio used to shed light on firm's way of funding or to compute its capability to meet financial obligations. There are a range of different ratios for this purpose. One of the most commonly and widely used measure of the financial leverage is the ratio of total liability to total assets Bevan and Danbolt (2002), Rajan and Zingales (1995) and Booth et al. (2001).

Accordingly, total liability can be defined, proxy of the trade-off theory, as follows:

$$Leve. = \frac{\text{total liability}}{\text{total assets}}$$

Where: *Leve.* is the financial leverage expressed as the debt ratio a proxy of the trade-off theory. Total liability is the sum of current and long-term liabilities. Total assets are the sum of all types of assets.

3.2.2 Independent Variables

3.2.2.1 Profitability

David and Olorunfemi, (2010) tested the effect of Leverage on firm's profitability. Utilizing panel data analysis the study finds a significant direct association between EPS and leverage, and a significant positive relation between DPS and Leverage. This result supports the trade-off theory, as the trade of theory States that the profitable companies better able to meet its debt obligations, and therefore, borrowing costs are relatively lower compared to the least profitable companies, which means that the profitable companies resort to borrow more to take advantage of the tax benefit and the advantage of the relatively low cost. The return on assets will be the proxy of the Profitability and can be defined as follows:

$$ROA = \frac{\text{net income befor tax}}{\text{total assets}}$$

Where: ROA is the proxy of the firm's profitability.

3.2.2.2 Firm's Size

Previous studies that examined the relationship between the firm's size and financial leverage concluded that the relationship between them is a statistically significant direct relationship (Bevan & Danbolt, 2002; Booth et al., 2001; Rajan & Zingales, 1995; Shah & Hijazi, 2005). This result support and is in line with the trade-off theory, which suggests that large firms are more profitable than small firms, therefore, they are better able to meet their debt obligations and are less likely to failure to meet commitments. Therefore, large firms get loans at relatively low cost, which encourages them to use debt as a source of funding.

Following Abor (2007), size is measured by the natural logarithm of the total assets, as follows:

$$SIZ = \ln(\text{total assets})$$

Where: SIZ is the natural logarithm of the total assets of the firm, proxy of the firms' size.

3.2.2.3 Growth Opportunity

Myers' (1977) suggested that Firms with high growth opportunities usually do not use long-term liabilities to finance their funding needs to avoid sharing the growth opportunities with debt holders. Accordingly, we expect that there will be an inverse relationship between the growth and long-term debt. But adding the short-term debt to the long-term to get the total debt may alter the direction of the relationship.

Following Zuraidah et al. (2012) and Abor, (2005) growth can be expressed as the sales growth, which is defined as the annual growth rate of the sales as follows:

$$GRW = \frac{S_t - S_{t-1}}{S_{t-1}}$$

Where: GRW is the annual sales growth proxy of the growth opportunity. S is the net sales amount. t^{th} is the time period.

3.2.2.4 Industry Effects

Many studies have concluded that the nature of the industry plays an important role in determining the debt ratio adopted by the company. For example, the utility sector is characterized as high leverage ratios, were high tech sector's characterized by their low leverage ratios.

To control for the industrial sector effect (INS_E), 11 dummy variables, which represent different industries of the Jordanian industrial sector, are used in the econometric model of the study. Sector 1 (Pharmaceutical and Medical Industries), Sector 2 (Chemical Industries), Sector 3 (Paper and Cardboard Industries), Sector 4 (Printing and Packaging), Sector 5 (Food and Beverages), Sector 6 (Tobacco and Cigarettes), Sector 7 (Mining and Extraction Industries), Sector 8 (Engineering and Construction), Sector 9 (Electrical Industries), Sector 10 (Textiles, Leathers and Clothing's), Sector 11 (Glass and Ceramic Industries). The dummy variable takes the value 1 if the firm is in that sector; otherwise it takes the value 0.

4. Methodology

We estimate Equation (1) to test the hypotheses that the trade-off theory is not valid for our sample firms of the industrial sector in the Jordanian capital market. The econometric model of the study to be estimated is as follows:

$$Leve_{it} = \beta_0 + \beta_1 ROA_{it} + \beta_2 SIZ_{it} + \beta_3 GRW_{it} + \sum_{k=1}^K \gamma_k D_i^k + \varepsilon_{it} \quad (1)$$

Where: $Leve$ is the financial leverage expressed as the debt ratio a proxy of the trade-off theory. it is the i^{th} cross sectional firm at the t^{th} time period. β^s are the slopes of the econometric model to be estimated. ROA is the return on the assets a proxy of the firm's profitability. SIZ is the natural logarithm of the total assets of the firm a proxy of the firms' size. GRW is the annual sales growth a proxy of the growth opportunity. $\sum_{k=1}^K \gamma_k D_i^k$ is the industrial sector effect (INS_E). $k = 1, 2, 3 \dots 11$. γ_k is the dummy variables coefficients. ε is the random error. D is the dummy variables for the industry effects takes the value as follows:

$$D_k = \begin{cases} 1 & \text{if the } i \text{ firm is in the } k \text{ sector} \\ 0 & \text{otherwise} \end{cases}$$

If the results show a statistically significant positive relationship between profitability (ROA) and debt ratio (Leve.) it means that the trade-off theory is valid for the Jordanian industrial firms. Also if at least one of the dummies variables coefficients is significant it will indicate the existence of the industrial effect on the trade-off theory.

5. Regression Analysis

Table 1 shows the results of the regression analysis of the equation (1), the table shows a statistically significant inverse relationship between profitability (ROA) and Leverage (coeff=-0.071, p-value=0.019). This implies that larger Jordanian industrial firms tend to rely less on debt in their capital structure. This result is consistent with the view that the most profitable companies resort to funding through internal funding and equity funds. This result is consistent with Kinsman and Newman (1998) and Majumdar and Chibber (1999) which concluded that, in general, the least profitable companies have usually higher leverage. This result is not consistent with the trade-off theory which states that the more profitable is the company the higher is the debt ratio.

Table 1. Regression analysis finding for model (1)

Variable	Coefficient	t-value	p-value	
Constant	1.057**	5.245	1.011E-7	
ROA	-0.071*	2.078	0.019	
SIZ	0.059**	3.057	0.001	
GRW	-0.0091	1.054	0.146	
<i>INS_D</i> ⁽¹⁾				
	<i>D</i> ₁	-0.0214	1.948	0.025
	<i>D</i> ₅	1.0248	4.364	7.160E-6
	<i>D</i> ₈	-0.0035	2.891	0.001
Adjusted R-Square	0.364			
df	Regression	14		
	Residual	960		
	Total	974		
	F.	40.967		
	Sig.	0.000		

Note. Dependent variable: ROA a proxy of the performance, *, **, significant at 0.05, 0.01 level respectively. (1) Only dummy variables for the industrial sector effect with significant effect were reported. *Leve* is the financial leverage expressed as the debt ratio a proxy of the trade-off theory. ROA is the return on the assets a proxy of the firm's profitability. *SIZ* is the natural logarithm of the total assets of the firm a proxy of the firms' size. *GRW* is the annual sales growth a proxy of the growth opportunity. *INS_E* is the industrial sector effect.

The table also shows a statistically significant direct relationship between the size of the Jordanian industrial firms and Leverage (coeff=0.059, p-value=0.001). This result is in line with Titman and Wessels (1988), Rajan and Zingales (1995), Deloof and Verschuere (1998) and Booth et al. (2001). This result is in line with the view that information asymmetries are less for large firms, and thus large firms have easier access to the market of debt finance with lower cost of funding, comparing to smaller firms, accordingly, this leads to higher debt ratio for larger firms. This result is consistent with the trade-off theory.

According to the trade-off theory, an inverse relationship between the growth opportunity and leverage is expected, due to the fact that high growth firms tend to have an overvalued share which encourages managers to issue shares to finance their needs for money, which makes the relationship between growth and leverage is an inverse relationship. The result shown in Table 1 supports the trade-off theory (coeff=-0.0091, p-value=0.149), but the results were not statistically significant.

For the second null hypothesis, which states that there are no statistically significant differences for the leverage level among various industrial sectors, the result shows that the coefficients for dummy variable 1, 5 and 8 were significant, indicating that the type of the industrial sector has a significant impact on the decision of using debt to finance the firms' need of money. Also the results shows that Pharmaceutical and Medical Industries sector and Engineering and Construction sector rely less on the debt than Food and Beverages sector. This result is consistent with the view that the utility sector more dependent on debt than high-tech sectors.

As for the R square, the results shows that profitability, firms' size and the industrial effect explain about 36% (Adjusted R-Square = 0.364) of the variation in the Jordanian manufacturing firms' leverage.

6. Conclusion

Regression analysis has shown conflicting results, the inverse relationship between profitability and leverage result is not consistent with the trade-off theory, indicating that more profitable Jordanian manufacturing firms tend to issue more equity and less debt to finance their need for funds. The direct relationship result between firms' size and leverage is in line with the trade-off theory, indicating that large firms tend to finance their needs of fund through issuing debt rather than equity. As for the growth leverage relation, the result in table 1 supports the trade-off theory, but the relation is not statistically significant.

In summary, The Jordanian manufacturing firms follow the trade-off theory partially, and the industrial sector

have an impact on the financing decision.

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