



Towards More Understanding of the Financial Leverage Controversy: The Evidence of the Industrial Firms at Amman Stock Exchange

Mohammed Abdullah Al-Momani¹, Mohammed Ibrahim Obeidat^{2*}

¹Department of Accounting, School of Economics and Business, Jadara University, Irbid, Jordan, ²Department of Business Administration, Al Ain Camus, Al Khawarizmi International College, United Arab Emirates. *Email: m.obeidat@khawarizmi.com

ABSTRACT

The study objects for investigating the most important internal determinants of financial leverage of the listed industrial firms at Amman Stock Exchange (ASE). It is a cross sectional study that it used the issued data of the total listed industrial firms at ASE, where the total number of these firms till the end of 2015 is 48. 7 independent variables the study takes into consideration including firms' size, liquidity, profitability, assets tangibility, earnings volatility, growth opportunities, and non-debt tax shield. Descriptive statistics, and simple and multiple linear regression methods are used in hypotheses testing. The study shows that liquidity, profitability, tangibility, each of which, have a significant impact on earnings volatility, where other independent variables that the study took into consideration, have no impact.

Keywords: Financial Leverage, Capital Structure, Assets Tangibility, Non-debt Tax Shield, Earnings Volatility, Return on Assets

JEL Classifications: G32, M41

1. INTRODUCTION

The controversy of financial leverage has a strong effect on the success of most business organizations. Moghadam and Jafari (2015) demonstrated that firms of more financial leverage are more profitable. In practice, some firms depend more on debt in its capital structure, whereas others depend more on equity. Despite that a large number of studies attempted to determine the most important determinants of financial leverage, but still no agreement regarding these determinants.

Financial leverage is defined as “the degree to which a firm utilizes borrowed money” (Gill and Mathur, 2011). To decide how much to borrow, and how much owners contribute in the capital structure, is not a simple issue, since, this decision affects profitability and its survival on the long range. It is already known that high degree of financial leverage is associated with higher risk, but most firms, use financial leverage to finance its operations, assets, and investments. High level of financial leverage may lead a firm for liquidation, especially when the used leverage is of high cost (Mandelker and Rhee, 1984). On opposite, a reasonable use of financial leverage

is considered beneficial for firms, especially when there are more attractive investments. In addition, an investment may seem attractive, when enough liquidity is unavailable to finance these investments (Patel, 2014), as a result, the firm finds that there is no option, just to borrow funds, especially when its current owners have no ability or desire to invest more in their business, and no more investors are willing to invest.

The study investigates an important problem, since it attempts to determine the factors affecting the proportion of financial leverage in the capital structure of business organizations. It attempts to determine the most important factors affecting the financial leverage in a developing country, that it depends completely on imported oil, and suffering from high external percentage of debt. In specific it investigates these determinants in manufacturing industry, where this industry creates more jobs in a country of high level of unemployment. The appropriate portion of financial leverage in capital structures of firms may differ from firm to firm, from industry to industry, and may be from one country to another. The problem of the study can be better presented through the following question; what are the most important determinants

of financial leverage in the capital structure of listed industrial firms at Amman Stock Exchange (ASE)?

The study stems its importance from the fact that the level of financial leverage has a long-range effect on different aspects of business organizations, especially their profitability, where more other aspects of business organizations are affected with profitability. Actually, financial leverage has more importance in manufacturing firms because the nature of this industry needs more assets than others, and a need for borrowing appears from time to time. In addition, the study is important in Jordan, where this country is affected by the financial crisis of 2008, and still it is suffering from this crisis till these days. This country imports all of its oil needs, and lacks most inputs of manufacturing, so it should be among the focus of academics, researchers, and practitioners to help this industry, especially where this industry creates more jobs than other industries in a country that is suffering high unemployment level since a long-period of time. The importance of the study increases because more dependence on borrowed funds leads to more risk, and may lead to liquidation, in case that the firm may be unable to pay its loans and interests for long period of time.

The key objective of the study is to determine the most important internal determinants of financial leverage for the listed industrial shareholding firms at ASE. A secondary objective of the study is the determination of whether differences are available in borrowing patterns among the industrial shareholding firms at ASE. In addition, the study contributes to the literature of financial leverage and its determinants.

The study differs from several prior researches in its timing, location, methodology, and the methods used in measuring some of its variables. In addition, the study takes place within a period of time where most industrial shareholding firms at ASE facing high difficulties and applied only on one industry that creates the highest number of jobs.

The remaining of the study is structured to be as follows. Section 2 presents the related literature and prior researches, while section 3 shows the hypotheses of the study. The methodology of the study had been shown in section 4, and the results and analysis of data are available in section 5. Section 6 lists the findings and conclusions of the study.

2. LITERATURE REVIEW

Normally, business organizations finance its investments by a mix of both of debt and equity. Using the debt in the capital structure of firms is what is called financial leverage. Therefore, financial leverage is the use of borrowed money in the capital structure of firms. Financial Leverage is defined as “the degree to which a firm uses fixed items, such as debt and preferred equity (Velez, 2010).” When a firm uses more debt in its capital structure, it is described that it is using more borrowed funds to finance its assets, while in opposite, when firms depends on more equity and less debt, it is described that this firm uses low financial leverage.

Some people use both terms of capital structure and financial leverage in a reciprocal way, despite that they are different. Actually financial leverage is related to capital structure, but it is not the same. Capital structure is defined as “a mixture of a variety of long term sources of funds and equity shares, including reserves and surpluses of the enterprise” Pratheepkanth (2011), while financial leverage is the use of debt in the capital structure. Therefore, whereas capital structure encompasses both of debt and equity as resources of financing, the financial leverage includes only the debt source of financing business organizations.

When a firm increases its use of financial leverage, it will incur more interests. While some prior studies found that earnings per share (EPS), is affected by the use of financial leverage (Patel, 2014; Khushbakht, 2013; Edwin et al., 2014), other studies found weak or no effect of financial leverage on EPS, such as Elangkumaran and Nimalathasan (2013). In addition to its opposite effect on profitability, financial leverage has an effect on financial risk. The rule is that, the higher the financial leverage, the greater the financial risk. When a firm uses more debts or more preferred shares, it will pay more interests, and then EPS will decline. This reduction in EPS means that the return of shareholders will be riskier.

Financial leverage can be described also as the amount of debt used by an entity for buying more assets. A firm uses a financial leverage to avoid using more equity to finance its operations. Risk of failure is increased by the increase in financial leverage, because the firm may be unable to pay the debt on time. Financial leverage can be measured directly by dividing total liabilities by total assets. Nevertheless, financial leverage may be beneficial when the rate of interests for borrowed amounts is less than the rate of return on investments, where this is called, trade in equity in the language of business. One advantage results from using financial leverage, is that financial leverage enhances profitability when its cost is less than the profits resulting from investing these borrowed amounts. In addition, because interest expense is deductible in calculating the income tax expense, the benefits of financial leverage increases.

Several theories of capital structure are available these days. Actually these theories started its appearance since 1958, where Modigliani and Miller (1958) published the theory entitled “irrelevance theory of capital structure.” According to this theory, Modigliani and Miller stated that the firm has a set of expected cash flows, and when it selects a proportion of debt and equity, all of what it does is that it divides up the cash flows among investors. The authors mentioned that financial leverage does not affect the firm’s market value.

The trade-off theory of capital structure is concerned with determining the optimal compromise between equity and debt. Based on this theory, firms attempt to balance between the advantages and disadvantages of debt. Among the advantages of debt is the tax reduction, because interest expenses are deducted from revenues, so firms will pay less income tax, while among the disadvantages is the direct and indirect costs of bankruptcy. Under this theory, firms strive to find a balance between debt and equity (Chirinko et al., 2000). Therefore, particular needs for

investments and capital expenditures of each industry are taken into consideration when searching for the optimal balance between debt and equity. According to this theory, firms with large tangible assets and stable revenues, tend to be financed with debt, while firms with low tangible assets tend to be financed with equity (Brealey et al., 2006).

In opposite to trade-off theory, agency theory looks for compromise to find out the optimal capital structure by balancing between agency costs and the advantages of debt. This theory states the amount of debt that sets the limit to management actions. This theory recognizes that a conflict may occur between owners and creditors. There is what is called dividend problem, where owners decide to pay dividends or other assets to themselves; creditors' position is weakened in this case. As a result of agency theory adoption, there is a possibility for "claim dilution problem" to some creditors, when a firm issues new debt with identical or even more favorable terms. Other problem results from following the agency theory is called asset substitution problem. The asset substitution problem occurs when a firm issues debt with low interest in order to invest in low-risky projects but decides to change the target into a project with higher riskiness. Other problem called underinvestment problem, which occurs when a firm decides not to invest into a project with positive net present value, but with a project that considered beneficial for creditors, but not for owners (Smith and Warner, 1979).

In addition to the trade-off theory, and agency theory, Myers (1984) introduced the pecking order theory. Under the pecking order theory, firms prefer internal financing and when more financing is needed it is fulfilled by externally, starting from debt because of its lower level of risk, then the issuance of convertible bonds, when more financing is needed. Under the pecking order theory, firms prefer external financing and debt to equity when external financing is needed. Moreover, pecking order behavior follows from simple asymmetric information models.

The last theory of financial leverage is the market timing theory or what is called signaling theory. The fundamental idea of market timing theory is that firms practice what is called "tactical finance" as the management owns favorable information over outside lenders and creditors. Therefore, the management has an incentive to exercise some actions, based on nominal desired gearing rate of the firm. This rate can be changed in an aggressive form to give the market a signal of current trend, direction, or conditions of the firm, because the higher the rate of gearing, the more indebted the firm (Frank, 1987).

A survey to some prior researches had been done in the issue of financial leverage. Actually, despite the importance of financial leverage decision, the subject had not been given the attention it deserves by academics, practitioners, and researchers. Despite the large effects of financial leverage on the success or fail of firms, the subject had not been given more attention. Some of the prior researches that handled the subject of financial leverage are presented as follows.

Tyrylahti (2015), investigated the determinants of financial leverage ratio of large publicly listed firms within Nordic Sector

of Telecom. Multiple linear regression method had been used in testing the hypotheses of the study. It finds that the theories and the earlier empirical evidence are confirmed by individual case companies non-systematically. The case study of Pakistan Sugar Producing Industry had been selected for determining the most important elements that determine the capital structure. Tanveer and Rasheed (2015) carried out this case study and encompasses 27 firms of sugar industry in Pakistan. The independent variables of the study included size, growth, liquidity, profitability, tangibility, inflation, and non-debt tax shield, while capital structure is the dependent variable. The study shows that large sugar firms prefer both of internal and external financing. The determinants of capital structure for 79 manufacturing listed firms at Istanbul stock exchange were investigated by Acaravaci (2015), over the period 1993-2010. The study shows a strong relationship between each of size, profitability, growth opportunities, and tangibility from one hand, and the financial leverage in the other hand.

Dudley and James (2014), investigated the relationship of volatility and capital structure. The study found that volatility matters more for firms that are financially constrained. These constrained firms issue debt when volatility is low. In more details, the study reveals that the observed relationship between cash-flow volatility and capital structure is driven by financially constrained firms' desire to ensure future financial flexibility. Fengjiu et al. (2013), investigated the relationship between financial leverage and profitability in Iran' Capital Market. The main purpose of the study was to investigate the effect of financial leverage on profitability, and whether income smoothing in listed companies is available in Tehran Stock Exchange. Conclusions showed that a relationship between financial leverage and profitability exists, and there are income smoothing firms. In more details, the study finds that firms involve smoothing, exercise this smoothing over gross profit, operating income, and net income. In addition, the results shows differences regarding financial leverage effect on profitability, between smoothing and non-smoothing firms.

AlKhatib (2012) carried out a related study to identify the most important determinants of leverage of listed firms in the Jordanian Stock Exchange. The study shows that no significant statistical relationships when industrial and service sectors are combined together, but when separated, the results of industrial sector showed that liquidity and tangibility have a significant relationship with leverage, whereas for the service sector growth rate, liquidity, and tangibility have a significant relationship with leverage. Utami (2012) carried out a study to investigate the determinants of capital structure of the manufacturing industry of Indonesia. The objective of the study was to investigate the determinants of capital structure of the manufacturing firms of Indonesia, and to analyze how firms of this industry raise capital. The study finds that profitability has a negative effect of short and long-term leverage, while size has a positive non-effect on short-term leverage, whereas it has a negative effect on long-term leverage. Moreover, the study reveals that financing deficit positively influences the issues of net debt and net equity. In addition, the study indicates no positive impact of net debt on market price of shares, and financing deficit has a positive significant effect on net debt and net equity.

Sheikh and Wang (2011) investigated the factors affecting financial leverage of manufacturing firms of Pakistan. The purpose of the author was to explore the factors affecting capital structure of manufacturing firms and to investigate whether the capital structure model for Western firms provides convincing explanations for manufacturing firms of Pakistan. The study reveals that financial leverage has a negative relationship with profitability, liquidity, volatility of earnings, and tangibility, while it shows a positive relationship between financial leverage and firm's size. At the same time, the study shows no relationship between financial leverage from one side, and both of non-debt tax shields, and opportunity of growth.

The determinants of capital structure of Indian industrial firms were within the attention of Mishra (2011). The purpose of the study was to identify the most important factors affecting the capital structure of Indian manufacturing firms. The most important findings of the study is that the capital structure is affected by assets tangibility, profitability, growth of assets, and tax. Franklin and Muthusamy (2011) investigated the determinants of using debt funds of the Indian Pharmaceutical Industry. It found that interests, asset structure, retained earnings, and intrinsic value of shares have a significant relationship with the capital structure of pharmaceutical institutions of India. In addition, the study reveals that Indian pharmaceutical firms employ a substantial amount of debt funds based on the computations of debt to equity ratio of the industry. The study also finds that the rate of annual growth of Indian pharmaceutical industry growth reaches 20%, so it is today one among the most major industries in the world based on its huge markets, and skilled laboratories.

Al Najjar and Taylor (2008) investigated the relationship between capital structure and ownership structure of Jordanian firms, by using a panel data approach. The study showed that the determinants of capital structure of Jordanian firms are similar to the determinants of capital structure of developed countries. The study also reveals that institutional ownership structure is determined by assets structure, business risk, growth opportunities, and firm size. The last conclusion of the study is that the joint determinants of ownership structure and capital structure include tangibility, firm size, opportunity of growth, and business risk. The factors affecting the firm's financial leverage were given enough attention by Kumar (2007). The finding of the study can be summarized into two conclusions. First, the study showed that various frameworks such as irrelevance, static trade off, pecking order, asymmetric information signaling framework helped in understanding the factors influencing and determining the financial leverage. Second, the study found that that there is no universal factor determining financial leverage.

Huang and Song (2006) showed that leverage of Chinese firms increases with firm size, non-debt tax shields and fixed assets, whereas, it decreases with profitability, and correlates with industry. The study also finds that ownership structure is influenced by leverage. Different from other countries, leverage of firms of China increases with volatility, and firms tend to have much lower long-term debt. In addition, the study shows that the static tradeoff model is better than pecking order hypotheses model in explaining

the features of capital structure. Bancel and Mittoo (2004) made a survey for managers of firms in 16 European countries to examine whether a link is available between theory and practice of capital structure across countries with differences in its legal system. The study finds that financial flexibility and EPS dilution are the most important determinants of capital structure choice. In addition, the study shows that hedging considerations and the use of window of opportunity in raising capital are seen by managers as important determinants. Moreover, the study shows moderate support evidence for trade-off theory and weak support for the agency theory. It shows similar determinants of capital structure in Europe as of U.S. The study supports the existence of small differences among European countries. The most important conclusion of the study is that there is a complete interaction of many institutional features and business practices affecting the decision of capital structure choice. Bauer (2004) carried out an important study regarding the determinants of capital structure. The key purpose of the author of the study was to identify the factors that determine the capital structure of firms. In this study, the author analyzed the determinants of capital structure in the Czech Republic during the period 2000-2001. He found that leverage of Czech firms is low when measured based on book value, while it is high when it is measured based on market value. The study shows that a significant positive relationship exists between financial leverage and size of firms, whereas a negative correlation exists between financial leverage and profitability. Moreover, the study reveals that there is a positive correlation exists between financial leverage and tax, and a negative correlation exists between financial leverage and non-debt tax shields. In addition, the study finds a relationship between financial leverage and industry classification. Fama and French (2002) investigated the shared predictions of trade-off and pecking order theories regarding debt and dividends. They demonstrated that more profitable firms and firms with fewer investments have higher payout. They also mentioned that more profitable firms have lower level of financial leverage. In addition, the authors showed among the shared predictions of trade-off and pecking order theories that firms of more investments have less leverage and less dividend payout, despite its dividends involve less volatility.

Ozkan (2001) investigated the empirical determinants of borrowings. The purpose of the study was to provide more information regarding the empirical determinants of target capital structure and the required adjustment to achieve the target. The author of the study used data of 390 UK firms over the period of 1984-1996. The study shows that firms have long-term target borrowing ratios and these firms adjust to the target ratios fast, which may suggest that the cost of being away from the target are significant. Other important finding of the study is that there is a positive impact of size, liquidity, profitability, non-debt tax shields, and a negative effect of growth opportunities, on capital structure. Titman and Wessels (1988) analyzed the explanatory power of some capital structure theories. The study found that debt levels are negatively related to the uniqueness of a firm's line of business. In addition, the study shows that transaction cost is an important determinant of capital structure choice, and short-term debt ratios are negatively related to capital structure.

Based on the survey of prior researches, several factors are found affecting the structure of firms' capital, despite that these factors may differ from one industry to another, and sometimes differ from country to country because of different legislation. The survey reveals that the most common determinants include firm's size, profitability, tangibility of assets, growth opportunities, tax and non-debt tax shields, volatility, and industry classification (Bauer, 2004), Huang and Song (2006), Rajan and Zengales (1995), and Friend and Lang (1988).

3. RESEARCH HYPOTHESES

Based on the findings of prior researches and on the survey made to the related literature, 8 hypotheses had been developed. The hypotheses of the study are shown, in its null form, as follows:

- H_{01} : Liquidity of the listed Jordanian industrial firms at ASE does not affect the degree of financial leverage in these firms.
 H_{02} : Profitability of listed Jordanian industrial firm at ASE does not affect the degree of capital structure of these firms.
 H_{03} : The size of the listed industrial firms at ASE has no effect on the financial leverage degree of these firms.
 H_{04} : Tangibility of listed industrial firms at ASE doesn't affect the degree of financial leverage of these firms.
 H_{05} : Growth opportunity of listed Jordanian industrial firms at ASE does not affect the financial leverage degree of these firms.
 H_{06} : Earnings volatility of listed industrial firms at ASE does not affect the degree of financial leverage of these firms.
 H_{07} : Non-debt tax shield of the listed industrial firms does not affect the financial leverage of these firms.
 H_{08} : The financial leverage of listed industrial firms at ASE is not affected by liquidity, profitability, size, tangibility, growth opportunity, volatility, dividends, and non-debt tax shield of these firms.

4. RESEARCH METHODOLOGY

The study is a cross sectional that investigates the determinants of capital structure of listed Jordanian firms at ASE using data along the period 2008-2015. The data used in the study are related to firms that did not prevented from listing over the period of the study. Therefore, data of all listed industrial 48 firms at ASE till the end of 2015 was collected and used in the analysis of hypotheses testing. The needed data is secondary in its nature.

The study is structured on one dependent variable and 8 independent. The dependent variable is the financial leverage, where it is measured using debt to total assets, which is computed by dividing total liabilities by total assets. The independent variables are; firm's size, profitability, liquidity, assets tangibility, growth opportunity, earnings volatility, and non-debt tax shield. Firms' size is measured using the natural logarithms of assets, while profitability is measured using return on assets (ROA), where this ratio is computed by dividing earnings before interests by total assets. Current ratio is used as an indicator for liquidity of firms, where this ratio is computed by dividing total current assets by total current liabilities. The rate of growth of sales is used as an indicator for the opportunity of growth. Tangibility of firms means the proportion of tangible assets to total assets, (Gill

and Mathur, 2011). The standard deviation of ROA is used in as a good indicator for earnings volatility, (Bauer, 2004). Non-debt tax shield is measured by using the ratio of depreciation expense to total assets.

Descriptive statistics including means, standard deviations, and frequencies are used in data description. Supporting analysis including, data normality and intra-dependent correlation were used as supporting analysis. Simple and multiple linear regression methods had been used in hypotheses testing. All hypotheses had been tested under 95% level of confidence, or 0.05 coefficient of significance. Therefore, the decision criterion for the acceptance or rejection of the null hypotheses is to accept the null hypothesis when the computed t value is less than the tabulated one, which equals 1.96, and to reject the null hypothesis when the computed t value is greater than the tabulated one, except for the last hypothesis, where the null hypothesis is rejected when the computed F value is higher than the tabulated, or when the computed coefficient of significance is less than the predetermined one, that it equals 0.05. In addition to the comparison between the computed and the tabulated t values, a comparison between the predetermined coefficient of significance and the computed one, is used as an equivalent criterion for decision regarding acceptance or rejection of a null hypothesis. Based on this criterion, a null hypothesis is accepted when the computed coefficient of significance is higher than corresponding predetermined one, while it is rejected when the computed coefficient of significance is less than the corresponding determined one. In occasion both criteria leads to the same conclusion.

The linear regression model is developed as follows.

$$FL = a + bLI + cPR + dSZ + eTA + fGR + gVO + hTS + E$$

Where:

$A, b, c, d, e, f, g,$ and h : Constants

FL : Financial leverage

LI : Liquidity of firms

PR : Profitability

SZ : Size of firms

TA : Tangibility

GR : Growth opportunity

VO : Earnings volatility

TS : Non-debt tax shield.

5. ANALYSIS AND DISCUSSION

5.1. Data Description

Before using the data in the analysis, data normality had been tested to be sure that the data within each variable is subject to normal distribution. The results of normal distribution test are shown in Table 1.

Considering Table 1, it is apparent that the coefficient of significance is zero for all variables, except tangibility, where its coefficient equals 0.002, but still refers that it is subject to normal distribution.

The mean and the standard deviation had been found for all variables along the period 2009-2015. Table 2 shows the means and the standard deviations.

Considering Table 2, the mean of financial leverage as it is measured by the debt ratio, increased from year to year, which means that during that period, the need for borrowings was growing from year to year. This phenomenon is supported when the current ratio, as a measure of liquidity, is noticed, and found that it was decreasing. The table shows that the proportion of tangible assets was generally stable. ROA as a measure of profitability was weak and negative in some years, where total assets were stable from year to year, therefore, the standard deviations of ROA was too low, which means that no great differences in ROA among the years. The rate of sales growth was low and negative in some years, and the ratio of depreciation expense to total assets was stable to a large degree. The standard deviation of current ratio was too much high, where other measures have normal standard deviation.

In addition, the correlation is used to test the correlation among the independent variables. Table 3 shows the coefficient of correlation (R) among the 7 independent variables of the study.

The table shows no high correlation among the independent variables. The coefficient of correlation between the ratio of

depreciation expense to total assets, and the ratio of tangible assets to total assets equals 0.323, which seems higher than others, but a type of correlation between assets tangibility and depreciation is normal to be available, since depreciation is computed only for tangible fixed assets.

5.2. Hypotheses Testing

The study consists of eight hypotheses, each of which had developed to represent the assumed effect of each independent variable on the single dependent variable of the study, except the last one, where it includes the effect of the entire set of independent variables on the dependent.

The first hypothesis, in its null form, states that liquidity of firms has no effect on the financial leverage of firms. The text of this hypothesis is presented again as follows.

H_{01} : Liquidity of the listed Jordanian industrial firms at ASE does not affect the degree of financial leverage in these firms.

Table 4 shows that the coefficient of correlation between liquidity (R), as measured by the current ratio, equals 0.481, whereas the coefficient of determination (R^2) = 0.231. The coefficient of correlation indicates the existence of a correlation between liquidity and financial leverage, despite this correlation is weak.

Table 1: Normal distribution test

Variable	Measure	Test Stat.	Asymp. significant	Mean±SD
Financial leverage	Debt ratio	0.114	0.000	0.3680±0.28361
Firms size	Log. assets	0.083	0.000	7.2843±0.58866
Tangibility	Tangible to total assets	0.063	0.002	0.3520±0.19014
Liquidity	Current ratio	0.063	0.000	2.9341±3.37720
Growth opportunities	Sales growth rate	0.220	0.000	0.0248±0.58876
Non-debt tax shield	Dept to total assets	0.0325	0.000	0.159±0.0325
Profitability	ROA	0.118	0.000	0.0006±0.05700
Volatility	ROA SD	0.63	0.000	0.0360±0.03033

SD: Standard deviation, ROA: Return on assets

Table 2: Means of variables

Variables	Mean±SD						
	2009	2010	2011	2012	2013	2014	2015
Debt ratio	0.327±0.256	0.344±0.312	0.382±0.361	0.371±0.249	0.367±0.233	0.385±0.245	0.399±0.313
Current ratio	3.297±3.718	3.462±4.104	2.850±2.971	2.778±3.044	2.771±3.251	2.623±3.183	2.753±3.346
Tangible assets	0.351±0.201	0.354±0.208	0.353±0.204	0.353±0.172	0.349±0.173	0.346±0.183	0.356±0.196
ROA	0.120±0.042	0.0035±0.049	0.004±0.062	0.0002±0.059	-0.0004±0.054	0.0043±0.062	-0.011±0.067
Log. assets	7.299±0.565	7.289±0.586	7.286±0.601	7.288±0.599	7.277±0.607	7.287±0.590	7.261±0.606
ROA SD	0.039±0.0342	0.0364±0.0311	0.0364±0.0311	0.0385±0.0347	0.0364±0.0311	0.0364±0.0311	0.0357±0.028
Sales growth rate	-0.115±0.285	0.218±1.233	0.086±0.358	0.137±0.440	0.012±0.521	-0.003±0.289	-0.166±0.252
Dept rate	0.0295±0.0222	0.039±0.063	0.0324±0.020	0.0334±0.028	0.0341±0.0327	0.0287±0.0186	0.0301±0.0188

SD: Standard deviation, ROA: Return on assets

Table 3: Coefficient of correlation among independent variables

	Dept rate	Sales growth	ROA SD	Log. assets	ROA	Current ratio	Tangible assets
Dept Rate	1.00	-0.034	0.055	0.065	-0.03	-0.099	0.323
Sales growth		1.00	-0.005	0.050	0.233	0.008	-0.032
ROA SD			1.00	-0.175	-0.251	-0.003	0.021
Log. assets				1.00	0.343	-0.291	0.050
ROA					1.00	0.013	-0.125
Current ratio						1.00	-0.286
Tangible assets							1.00

SD: Standard deviation, ROA: Return on assets

In addition, the coefficient of determination means that liquidity explains around 23% of change in financial leverage.

Table 4 also shows that $t = -10.017$, which means that a negative effect of liquidity on the level of financial leverage exists. In addition, the table reveals that the computed coefficient of significance equals zero. Because the computed t value is higher the corresponding tabulated one that equals 1.96 and because the computed coefficient of significance is less than the predetermined one that equals 0.05, the null hypothesis is rejected, where the alternative one is accepted. This result demonstrates that liquidity of listed industrial Jordanian firms at ASE affects the level of the financial leverage of these firms. Considering the coefficient of correlation (R), the analysis reveals a moderate correlation between financial leverage and liquidity, where based on R^2 (coefficient of determination), liquidity explains about 23% of change in the financial leverage.

The second hypothesis is developed to represent the assumed effect of profitability on the financial leverage of listed industrial firms at ASE. The text of this hypothesis is again presented as follows.

H_{02} : Profitability of listed Jordanian industrial firm at ASE does not affect the degree of capital structure of these firms.

ROA is used as an indicator for the profitability of firms. Table 5 reveals that the coefficient of correlation (R), between profitability and financial leverage, equals 0.411, and the coefficient of determination $R^2 = 0.169$. These results reveal an existence of correlation between profitability and financial leverage, and that profitability explains 0.169 of the change in financial leverage.

The table also shows that the computed $t = -8.239$, and the coefficient of significance is zero. It is apparent that the computed t -value is higher than the tabulated one, which equals 1.96, and the coefficient of significance is less than the predetermined one, which equals 0.05. Based on the computed t -value and the coefficient of significance, the null hypothesis is rejected, whereas the alternative one is accepted.

The effect of size on financial leverage is the subject of the third hypothesis. The third hypothesis is developed to represent the assumed effect of firm's size on the financial leverage, as its text shows below.

H_{03} : The size of the listed Jordanian industrial firms at ASE has no effect on the financial leverage degree of these firms.

Natural logarithms of total assets are used as an indicator for the size in the study. Table 6 shows that there is no or weak correlation, since the coefficient of correlation (R) is 0.08. In addition, the coefficient of determination is also low, where it equals 0.007, so this means that size of firms does not contribute in explaining the variation in financial leverage level.

The table shows that the computed $t = 1.541$, while the computed coefficient of significance is 0.124. When the computed t value is compared with the tabulated one, which equals 1.96, it is apparent that the computed t value is less than its corresponding tabulated one. In addition, when the resulting coefficient of significant is compared with its predetermined corresponding

one, which equals 0.05, it is clear that the resulted computed one is higher than the predetermined. Because the computed t value is less than its corresponding one, and because the computed coefficient of variation is higher than predetermined corresponding one, the null hypothesis is accepted, and the alternative one is rejected.

The fourth hypothesis is listed again below as follows.

H_{04} : Tangibility of listed Jordanian industrial firms at ASE doesn't affect the degree of financial leverage of these firms.

Table 7 shows low correlation between assets tangibility and financial leverage, where $R = 0.195$ and $R^2 = 0.038$. This means that low proportion of change in financial leverage is explained by assets tangibility of firms.

The table also shows that the computed $t = 3.633$ and the resulting computed coefficient of significance is zero or close value to zero. When the computed t value is compared with its corresponding tabulated one that equals 1.96, it is apparent that the computed one is higher. In addition, when the computed coefficient of significance is compared with the predetermined one that equals 0.05, it is found that the computed one is less than the predetermined one. Based on these results the null hypothesis is rejected and its alternative one is accepted.

The fifth hypothesis of the study is also presented again as follows.

H_{05} : Growth opportunity of listed Jordanian industrial firms at ASE does not affect the financial leverage degree of these firms.

Table 4: Statistics of the first hypothesis

Hypothesis	R	R ²	Degrees of freedom	t value	Significant
H_{01} (current ratio)	0.481	0.231	335	-10.017	0.00

Table 5: Statistics of the second hypothesis

Hypothesis	R	R ²	Degrees of freedom	t value	Significant
H_{02} (ROA)	0.411	0.169	335	-8.239	0.00

ROA: Return on assets

Table 6: Statistics of the third hypothesis

Hypothesis	R	R ²	Degrees of freedom	t value	Significant
H_{03} (Log. assets)	0.08	0.007	335	1.541	0.124

Table 7: Statistics of the fourth hypothesis

Hypothesis	R	R ²	Degrees of freedom	t value	Significant
H_{04} (tangibility)	0.195	0.038	335	3.633	0.00

Table 8 shows 0.033 coefficient of correlation, where this coefficient is too low. Moreover, the table shows 0.001 coefficient of determination, where R^2 of 0.001 means that the rate of growth of sales does not contribute in explaining the change in financial.

Table 8 also reveals that the computed $t = -0.581$, and the coefficient of significance equals 0.562. When the computed t value is compared with the corresponding tabulated one, it is found that the computed t value is less than the tabulated one that equals 1.96. Moreover, comparing the coefficient of significance with the predetermined one that equals 0.05, it is found that the computed one is higher than the predetermined one. Based on these results of analysis, the null hypothesis is accepted and its alternative one is rejected.

The sixth hypothesis is presented again as follows.

H_{06} : Earnings volatility of listed Jordanian industrial firms at ASE does not affect the degree of financial leverage of these firms.

The standard deviation of ROA is used as an indicator for firms risk or what is called volatility. Table 9 shows the related statistics to the sixth hypothesis. The table reveals that $R = 0.234$, where it shows $R^2 = 0.055$. These values of correlation and determination coefficients indicate low correlation between volatility of earnings and financial leverage, and that the volatility of firm's profits does not explain a significant proportion of the change that takes place in financial leverage.

Table 9 also reveals that the computed $t = 4.397$ and the computed coefficient of significance is zero. When the computed t value is compared with the tabulated one, which equals 1.96, it is found that the computed one is higher. In addition, when the computed coefficient of significance is compared with the predetermined one which equals 0.05, it is apparent that the predetermined one is less. Because the computed t value is less than the tabulated, and because the computed coefficient of significance is less than the predetermined, the null hypothesis is rejected, where instead, the alternative one is accepted.

Non-debt tax shield is the subject of the seventh hypothesis. The hypothesis is presented again as follows.

H_{07} : Non-debt tax shield of the listed industrial Jordanian firms does not affect the financial leverage of these firms.

Table 10 shows the related statistics to the eighth hypothesis. The table shows 0.002, coefficient of correlation and zero coefficient of determination (R^2). This means that no correlation exists between non-debt tax shield and the financial leverage of listed industrial firms at ASE, and that the non-debt tax shield has no role in explaining the change in financial leverage.

Table 10 also shows the computed t -value and the coefficient of significance. It reveals $t = 0.044$ and 0.965 coefficient of significance. The comparison between the computed t value and the tabulated one, which equals 1.96, reveals that the computed one is less, and the comparison between the computed coefficient of

Table 8: Statistics of the fifth hypothesis

Hypothesis	R	R ²	Degrees of freedom	t value	Significant
H_{05} (growth)	0.033	0.001		-0.582	0.562

Table 9: Statistics of the sixth hypothesis

Hypothesis	R	R ²	Degrees of freedom	t value	Significant
H_{06} (Volatility)	0.234	0.055	335	4.397	0.00

Table 10: Statistics of the seventh hypothesis

Hypothesis	R	R ²	Degrees of freedom	t value	Significant
H_{07} (Non-debt tax shield)	0.002	0.000	335	0.044	0.965

significance and the predetermined one reveals that the computed one is higher. Therefore, the null hypothesis is accepted and its alternative hypothesis is rejected.

The eighth hypothesis is general since it includes the total assumed effect of the entire group of independent variables. The text of the hypothesis, in its null form, is again presented as follows:

H_{08} : The financial leverage of listed industrial Jordanian at ASE is not affected by liquidity, profitability, size, tangibility, growth opportunity, volatility, dividends, and non-debt tax shield of these firms.

The eighth hypothesis had been tested using the multiple linear regression method. Table 11 shows a 0.674 coefficient of correlation, and 0.454 coefficient of determination. This means that the 7 variables together interpret about 45%, and there are additional variables contribute in affecting the financial leverage, but the study does not take into consideration because the study investigates only the internal determinant.

Table 11 reveals that the computed $t = 37.743$ and the coefficient of significance equals zero. When the computed coefficient of significance is compared with its corresponding one that equals 0.05, it is apparent that the computed one is less. Therefore, the null hypothesis is rejected, and the alternative one is accepted.

The parameters and the coefficient of significance for the multiple linear regressions for each variable individually and for the entire group of these independent variables, and t values together are shown in Table 12.

As a result of analysis the regression model when parameters of the model becomes as follows:

$$FL = 0.031 - 0.56LI - 1.766PR + 0.058SZ + 0.078TA + 0.023GR + 1.66VO - 0.063TS + E$$

Table 11: Statistics of the eighth hypothesis

Hypothesis	R	R ²	Degrees of freedom	t value	Significant
H ₀₈ (Total independent variables)	0.674	0.454	336	37.743	0.00

Table 12: Parameters and coefficients of significance

Variable	t value	Significant	β value
Liquidity	-9.878	-9.878	-0.056
Profitability	-1.766	-7.252	0.000
Size	2.574	0.011	0.058
Tangibility	1.128	0.260	0.078
Growth opportunity	1.122	0.263	0.023
Earnings volatility	4.130	0.000	1.66
Non-debt tax shield	-1.670	0.096	-0.631

6. CONCLUSIONS AND FINDINGS

The primary objective of the study is to investigate the determinants of financial leverage for the manufacturing listed firms at ASE. Data had been collected and analyzed, and the developed hypotheses had been tested. Based on the results of data analysis and hypotheses testing, the study finds that there is a significant negative effect of liquidity the financial leverage. This conclusion is in agreement with AlKhatib (2012), Ozkan (2001), and Sheikh and Wang (2011). In addition, the study shows that profitability also has a significant negative effect on financial leverage. This conclusion is in agreement with Ozkan (2001) Utami (2012), Bauer (2004), Fama and French (2002), Sheikh and Wang (2011), Mishra (2011), and Acaravaci (2015). Moreover, the study demonstrates that assets tangibility affects the financial leverage of firms. In occasion, this conclusion is in agreement with AlKhatib (2012), Haung and Song (2006), Al Najjar and Taylor (2008), Sheikh and Wang (2011), Mishra (2011), and Acaravaci (2015). Results reveal that earnings volatility has also a positive effect on financial leverage. This finding is in agreement with Al Najjar and Taylor (2008), and Sheikh and Wang (2011).

The study does not find a significant effect of size on firms' financial leverage. Actually this finding is in agreement with (Ozkan, 2001). Moreover, no significant effect the study finds of tax shield, and growth opportunities on financial leverage. This conclusion agrees the conclusion of Sheikh and Wang (2011). The most important findings is that there is a significant positive shared effect of the entire group of the independent variables together on the financial leverage of firms, despite some of them have no individual effect. Actually, this finding is in disagreement with Kumar (2007), while it seems in agreement with Tyrylahti (2015).

The study recommends more investigation of internal and external determinants of financial leverage, and using new measures for the different determinants is also recommended.

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