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Financial leverage and firm performance evidence from Amman stock exchange

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Abstract

This study tests the relationship between financial leverage and firm performance. Previous studies found mixed results (e.g., Gill et al. 2011, Mouna et al. 2017, and Abubaker (2015). Some suggest including the effect of the firms' business strategy and the degree of competitiveness on the relationship between the financial leverage and the firms' performance. Data is subjected to pooled General Least Square to test the hypotheses of the study. Based on a sample from Amman Stock Exchange, the study finds that the financial leverage has a negative relationship with the firm performance proxies by ROA and EVA. In addition, the relationship between financial leverage and performance is more negative for the firms that use product differentiation strategy compared with the firms that use low-cost strategy and for the firms with a high degree of competitiveness compared with the firms with a low degree of competitiveness. Different tests including the Wald F-test on the linear restrictions support confirm the above conclusions. Different diagnostic tests show that the results are reliable, free from autocorrelation, robust, and not affected by multicollinearity.

JEL classification: D21, G32, M41, N25, L19

Keywords: Financial leverage, Firm performance, Business strategy, Competitiveness

1. Introduction

Studying the relationship between financial leverage and firm performance has contradictory results. Some researchers argue that the differences in the results may due to the differences in the approaches used in analyses (e.g., O'Brien 2003). A few previous studies (e.g., King and Santor 2008, and Philips and Sipahioglu 2004) have examined the direct relationship between financial leverage and firm performance while others (e.g. Jermias 2008) have examined the relative influence of the competitive intensity and business strategy on the relationship between financial leverage and firm performance.

Modigliani and Miller (1958) suggest that financial leverage is irrelevant to firm performance. Some studies (e.g., Jensen and Meckling 1976, Brander and Lewis 1986, Grossman and Hart 1983, and Jensen 1986) suggest a positive relationship between financial leverage and firm performance. On the other hand, other studies (e.g., Myers 1977, Maksimovic and Titman 1991, and Titman 1984) suggest a negative relationship.

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Using panel data consisting of 56 manufacturing firms from the Amman Stock Exchange during the period between 2011 to 2014, the study tries to answer the following three questions. First, does financial leverage have a negative relationship with firm performance in developing countries like Jordan? Second, will this relationship be more negative for the firms that use product differentiation strategy compared with the firms that use the low-cost strategy? Finally, will this relationship be more negative for the firms with high degrees of competitiveness compared with the firms with a low degree of competitiveness?

This study examines the effect of financial leverage on firm performance using two different approaches of analyses, namely, the direct relationship between financial leverage and firm performance and the relative influence of competitiveness and business strategy on the relationship between financial leverage and firm performance.

The study contributes to the literature by trying to solve the puzzle in the mixed results and test whether using different approaches have an effect on the results of studying the relationship between financial leverage and firm performance. Evidence on the relationship between financial leverage, firm performance, competition and business strategy is generally limited, especially in developing countries. This work may help in filling the gap. In addition, this work may have a few implications for practitioners and management. The study uses two dependent variables (ROA and EVA) as proxies for firm performance. In addition, it uses two control variables (EMP and FA) to control the value chain risk. This is considered very important and neglected by a number of authors in the literature.

It is important to say that the study has a few limitations that may affect its results. We use data from only the manufacturing industry due to the limited availability of data required for the analyses in other industries in the Amman Stock Exchange. In addition, Parthiban et al. (2008) suggest that the type of debt (bank debt or bond debt) may affect the relationship between competitiveness and performance. Information related to breaking down the debt to bank debt, bond debt and other debt is not available. Finally, other variables may have some affects between the relationship between the leverage and firm performance, such as, the economic and political conditions such as the Arab Spring and the sharp drop in the oil prices during the study period. Excluding these variables may influence the results.

The remainder of the paper is organized as follows. Section 2 introduces the literature review. Section 3 describes the research methodology and hypotheses. Section 4 presents the data analyses and empirical results. Finally, section 5 summarizes and concludes the results.

2. Literature Review

2.1. The Trade-Off Theory

The original version of the trade-off theory grew out of the debate over Modigliani-Miller (Frank and Goyal, 2011). The trade-off theory suggests that firms choose how much to finance with debt or equity by balancing their costs and benefits (Muritala, 2012). Mohamad and Abdullah (2012) argue that the trade-off theory implies that financial leverage has a positive relationship with the firms' performance. Trade-off theory considers the cost of bankruptcy associated with debt financing as well as the tax advantage.

The theory explains how the corporations usually distribute its finance partially between debt and equity. The advantage of debt financing is the tax benefit of debt, while the disadvantages are represented by both the bankruptcy and non-bankruptcy costs of debt. According to the trade-off theory, the decision makers in the corporations evaluate the various costs and benefits of alternative leverage plans to determine their level debt financing by trading off the cost and the benefit of debt.

2.2. Direct relationship between financial leverage and firm performance

The impact of financial leverage and performance has been the major focus of many studies (e.g., Jensen and Meckling 1976, Brander and Lewis 1986, Grossman and Hart 1983, Jensen 1986, Myers 1977, Maksimovic and Titman 1991, and Titman 1984). The famous influential paper by Modigliani and Miller (1958) developed different theoretical predictions to build a solid foundation of the relationship between financial leverage and firm value. The previous studies' results remain unclear in determining this relationship.

For example, Fama and French (2002); Gill et al. (2011); Ramachandran and Candasamy (2011); Wang (2003); Goyal (2013); Saeed, et al. (2013); Nawaz et al. (2011);

and David and Olorunfemi (2010) find a positive relationship between leverage and profitability.

On the other hand, Pouraghajan and Malekian (2012); Olokoyo (2013); Quang and Xin (2014); Sheikh and Wang (2013); Mireku et al. (2014); Krishnan and Moyer (1997); King and Santor (2008); Muritala (2012); Babalola (2012); and Mohamad and Abdullah (2012) find a negative relationship between leverage and firm performance. Mouna et al. (2017) examine the relationship between capital structure and the firms' performance. The results show that debt ratio has a negative significant effect on the return on assets, debt equity ratio has a negative significant effect on return on equity, and size has a positive significant impact on firm performance using return on equity as proxy. Nisha and Ghosh (2018) examine the cause and effect relationship between leverage and the financial performance of firms. They find a negative relationship persists between leverage and performance. In addition, they find that there was no significant difference in the financial performance between high levered and low-levered firms, neither in their size nor in their growth rates. Akpinar and Yigit (2016) examine the difference between the types of diversification and performance comparing Turkey, Italy and Netherlands. They find no correlation between the types of diversification and performance in both Italy and Netherlands, while there is a low-level of positive correlation in Turkey. This means that the results may differ by country.

Modigliani and Miller (1958) expect that the capital structure of a firm is irrelevant to its performance. However, capital structure affects the tax-deductibility of debt interest and agency theory. Abubaker (2015) investigates the relationship between financial leverage and financial performance of the deposit money banks in Nigeria. The findings indicate that there is no significant relationship between the debt ratio and financial performance surrogated by ROE. Myers (1997) expects that the leverage may affect the investment and reduce the market value of the firm. Titman (1984) argues that leverage affects the likelihood of a firm's liquidation. Maksimovic and Titman (1991) suggest that a high level of leverage has a negative effect on firm performance. Philips and Sipahioglu (2004) report insignificant results between financial leverage and firm performance. Muritala (2012) examines the optimum level of capital structure through which a firm can increase its financial performance. The author expects a negative relationship between capital structure and operational firm performance. He finds that

asset turnover, size, the firm's age and the firm's asset tangibility are positively related to the firm's performance. Lawal et al. (2018) examine the effect of ownership structure on financial performance. Ownership structure proxies by managerial ownership, institutional ownership, and ownership concentration are adopted as independent variables. The study finds ownership structure to have a significant positive effect on financial performance when it is proxies as managerial ownership and institutional ownership while having a significant negative effect when it is proxies as ownership concentration. However, in respect of the size and growth of the firms, which form the control variables of the study, there are mixed evidences of their effects on financial performance. Khamis et al. (2015) assess the relationship between ownership structure dimensions and corporate performance. They find that ownership concentration has a negative relationship on a company's performance while managerial ownership and institutional ownership have a positive relationship on a company's performance.

Based on previous literature, empirical conclusions have mixed results. Some report a negative relationship while others report positive or insignificant effects. Some studies suggest that the relationship between the leverage and performance is conditional on the degree of agency problem associated with firms. For example, Schoubben and Van Hulle (2004) show that leverage has a positive effect on quoted firms but a negative on non-quoted firms. Ruland and Zhou (2005) find that leverage improves the performance of diversified firms.

2.3. Leverage, competition and performance

Some literature find that market competition is significant when studying the relationship between leverage and performance, assuming that the competition will increase when a firm's leverage increases (e.g., Brander and Lewis 1986, Chevalier 1995, and Philip 2012). Leverage firms often create an opportunity for competition since debt requires periodic payments to the creditors. The firm will liquidate if it fails to do so. Debt encourages competition for the firms to continue in the market. Brander and Lewis (1986) expect that leverage leads firms to be more aggressive in competition due to the limited liability.

Other literature suggest that firms with high leverage may suffer competitive disadvantage. Wanzenried (2003) suggests that the limited liability effect of debt may fail

to improve the profitability of the leveraged firms. Chevalier and Scharfstein (1996) show that leveraged firms charge higher prices during recession. This suggests that they have a competitive disadvantage. Chevalier (1995) finds that an increase in leverage leads to an increase in the market value of competitors. Even though the previous literature finds mixed results in studying the effect of market competition in the relationship between leverage and performance, a majority of them find that leveraged firms increased the likelihood of the competition in highly competitive market while they are more vulnerable to competition in uncompetitive markets.

2.4. Leverage, business strategy and performance

Some previous literatures suggest studying the effect of business strategy on the relationship between leverage and firm performance (e.g., Jermias, 2008). Porter (1985) believes that a firm must choose between product differentiation strategy or low-cost strategy. To be product differentiation strategy or low-cost strategy, a firm's relation between financial leverage and its performance will be affected. Low-cost strategy firms will benefit more from the leverage in order to be more efficient because they are more monitored by the lenders. On the other hand, product differentiation firms invest more in research and development activities in order to be able to convey with their competitors' innovations. O'Brien (2003) finds that business strategy and financial leverage affect performance. Jermias (2008) expects that the relationship between leverage and performance would be more negative for product differentiators than cost leaders.

To summarize, empirical evidences provide different results in studying the relationship between the financial leverage and firm performance in developed economy. These inconsistent results and the limited studies that empirically test this relationship in developing countries, like Jordan, is considered the motivation for this study.

3. Research Methodology:

3.1. Hypotheses:

1. Leverage and performance: As discussed above, studying the relationship between financial leverage and firm performance in previous literature has mixed

results. Some results have found positive relationships, while, on the other hand, others found negative relationships. The idea behind positive or negative according to the agency cost theory depends on the relationships between shareholders and managers, and those between debt-holders and shareholders (Jensen and Meckling, 1976). According to the agency costs theory, the relation is positive when the agency costs of equity between shareholders and managers, while it is negative when the agency costs of debt between shareholders and creditors. We believe that debt financing creates investment problems to shareholders because its total average costs are higher than the returns especially in emerging markets like ASE. If shareholders can avoid share their investment with debt holder, their returns on investment will be higher. This means that we expect a negative and significant relationship between financial leverage and firm performance. Thus, based on the above, our first hypothesis is presented as follows:

H1: Leverage has a negative and significant relationship with firm performance.

H1 is tested empirically using the following model:

$$\text{Model 1: } PER_{it} = \alpha_0 + \alpha_1 LEV_{it} + \alpha_2 Size_{it} + \alpha_3 SG_{it} + \alpha_4 Eff_{it} + \alpha_5 Tang_{it} + \alpha_6 Age_{it} + \varepsilon_{it} \quad (1)$$

where PER_{it} is the performance of firm *i* in year *t* determined by ROA measured as sales revenue less cost of goods sold divided by its average total assets. LEV_{it} is financial leverage of firm *i* in year *t* determined by the ratio of average total debt to book the value of average total assets. $Size_{it}$ is the natural logarithm of average total assets of firm *i* in year *t*. SG_{it} is the one-year growth rate of sales of firm *i* in year *t*. Eff_{it} is the firms' efficiency determined by the ratio of sales revenue divided by average total assets of firm $_i$ in year $_t$. $Tang_{it}$ is the assets' tangibility determined by the ratio of average net fixed assets divided by average total assets of firm *i* in year *t*, Age_{it} is natural logarithm of age of firm *i* in time *t* measured by the number of years of operation since the year was incorporated to each year of the period under study. The firm size, sales growth, firm efficiency, assets tangibility and firm age are control variables added to the model to verify that these variables do not affect the results of studying the relationship between leverage and the firm performance.

2. Leverage and business strategy: Jermias (2008) argues that the inconsistent results of prior literature on the relationship between financial leverage and firm performance may be due to, in part, the approach used by researchers. Most of them test the direct relationship between financial leverage and firm performance. Some previous studies (e.g. O'Brien, 2003) suggest that excluding firm's business strategy may be the reason for such contradictory results. Porter (1985) develops a framework that shows how firms can improve their performance by choosing a suitable business strategy. He believes that a firm must choose between product differentiation strategy or low-cost strategy. Jordan et al. (1998) suggest that firms using low-cost strategy will benefit more from using leverage because lenders will monitor their managerial efficiency. Jensen (1986) proposes that lenders are more interested in monitoring firms that try to be efficient. Porter (1985) suggest that firms using low-cost strategy try more to control cost and not incurring too many expenses from innovation and marketing to cut their selling prices. On the other hand, a few researchers (such as Miller, 1987) argue that firms using product differentiation strategy tend to invest more in research and development activities to improve their products to convoy with their competitors. Biggadike (1979) suggests that firms using product differentiation strategy having more risk activities due to the uncertainty of their research, development and innovations results. This may lead them to be more cautious to use more amount of debt. In the H1 above, we expect that leverage has a negative and significant relationship with firm performance. According to the above discussions, we expect that the strategy of the firm choice, to be whether low-cost or product differentiation, will affect the relationship between financial leverage and firm performance. Following Jermias (2008), we expect that the relationship between leverage and performance will be more negative for the firms that are using product differentiation strategy compared with the firms that are using low-cost strategy. Thus, based on the above, our second hypothesis is presented as follows:

H2: the relationship between leverage and performance will be more negative for the firms that use product differentiation strategy compared with the firms that use low-cost strategy.

3. Leverage and the degree of competitiveness: A few empirical previous studies (e. g. O'Brien, 2003) show that excluding firms' competitiveness when studying the relationship between leverage and firm performance is considered as a limitation. Firms with highly competitive industries meet higher risk business environments if they depend more on leverage because they are not able to guarantee their future. As a result, firms with highly competitive industry may not be willing to use a greater amount of debt. Philip (2012) empirically shows that the cost of bank debt is systematically higher for firms that operate in competitive product markets. He finds that competition has a significantly positive effect on the cost of bank debt. Williamson (1975) argues that debt has no real benefits when competitive intensity is high. Jermias (2008) finds that the relationship between leverage and performance will be more negative as the level of competitive intensity increases. He argues that competition acts as a substitute for debt in limiting managers' opportunistic behavior. Agency theory suggests that firms which operate with highly competitive intensity market, have a highly risky business environment. Debt may become more expensive because it reflects more risk and uncertain outcomes (Jensen and Meckling, 1976; Botosan and Plumlee, 2005). In other words, we may expect a negative relationship between leverage and the degree of competitiveness which may act as a substitute for debt. Thus, based on the above, our third hypothesis is presented as follows:

H3: the relationship between leverage and performance will be more negative for the firms with a high degree of competitiveness compared with the firms with a low degree of competitiveness.

H2 and H3 are tested empirically using the following two models:

Model 2:
$$PER_{it} = \alpha_0 + \alpha_1 STR_{it} + \alpha_2 COM_{it} + \alpha_3 LEV_{it} + \alpha_4 Size_{it} + \alpha_5 SG_{it} + \alpha_6 Eff_{it} + \alpha_7 Tang_{it} + \alpha_8 Age_{it} + \alpha_9 EMP_{it} + \alpha_{10} FA_{it} + \varepsilon_{it} \quad (2)$$

Model 3:
$$PER_{it} = \alpha_0 + \alpha_1 STR_{it} + \alpha_2 COM_{it} + \alpha_3 LEV_{it} + \alpha_4 STR*LEV_{it} + {}_5 COM*LEV_{it} + \alpha_6 Size_{it} + \alpha_7 SG_{it} + \alpha_8 Eff_{it} + \alpha_9 Tang_{it} + \alpha_{10} Age_{it} + \alpha_{11} EMP_{it} + \alpha_{12} FA_{it} + \varepsilon_{it} \quad (3)$$

where STR_{it} is dummy variable = 1 for firms with high research and development costs, and 0 for firms with zero or low research and development costs, COM_{it} is the logarithmic function of the Herfindahl based on ASE market's classifications for the manufacturing firms, $STR*LEV_{it}$ is the interaction between STR_{it} and LEV_{it}, $INT*LEV_{it}$ is the interaction between INT_{it} and LEV_{it}, EMP_{it} is the one-year change in the number of employees divided by beginning year number of employees, FA_{it} is the one-year change in the net fixed assets divided by the beginning balance of net assets, and all other variables are as defined above. As firms' cannot weaken the negative relationship between firms performance and leverage by the value addition in the value chain operation as both product differentiation and cost leadership strategy may improve the increments in the value chain operation of individual firms in the particular industry, we add EMP and FA as strategy control variables to models 2 and 3.

3.2. Sample selection

In examining the effect of capital structure on the performance, panel data from 56 of manufacturing institutions that have been listed in ASE for the period between 2011 to 2014 have been used. All financial data (ROA, research and development costs, leverage, sales growth, sales revenue, assets, net fixed assets, net operating profit after tax, current liabilities, and firms' age) were extracted from the COMPUSTAT Global Vantage. When unavailable, the annual reports were used to extract the missing data. Finally, we used the firms' websites to extract the firms' age and number of employees, and the ASE market's website to extract the classifications for the manufacturing firms. The total companies listed in ASE is 223. We excluded firms that are not classified as manufacturing institutions as sectors other than manufacturing have large missing data or zero research and development costs. In addition, by focusing on only one industry and including higher market shares, we got rid of reporting limitations and avoid any confounding that might occur if diversified firms were used (short et al., 2007), and avoid statistical noise that would occur if the firms operated in multiple industries (Mauri and Michaels, 1998). We use four years of performance data to provide a stable measure of firm performance. Other manufacturing firms with missing values which are either dependent variables or independent variables throughout the period of the study are also excluded. A sample size of the remaining 56 listed manufacturing companies on

ASE during a period of 4 years from 2011 to 2014 have been considered for analysis. The sample is restricted to firms with complete useful data, and all variables are measured at the fiscal year-end and expressed in Jordanian Dinars.

Panel A of Table 1 shows the sample selection and panel B of Table 1 shows the industries' representation of the sample firms. The overall Jordanian manufacturing industry has been divided into six sub-industries. Pharmaceutical and medical, Chemical Industries, Food and Beverages, Mining and Extraction, Electrical, Engineering and constructions, and Textiles leather and clothing. The data are annually collected from all the manufacturing institutions where the data is available and covers the four-year period.

The following set of data is captured to represent both the dependent and the independent variables. For dependent variable, we employ return on assets (ROA) as the measures of performance. The financial ratios have been used in different studies in prior literature (for example, Demstz and Lehn, 1985; Gorton and Rosen, 1995; Mehran, 1995). For independent variables, we employ the following variables:

Table 1. Sample selection and industries' representation

Panel A: Sample selection for Amman Stock Exchange firms in manufacturing industry	
Total number of firms listed in Amman Stock Exchange	223
Less: Non-manufacturing firms	161
Sample before data restrictions	62
Less: Less: firms without complete data needed for data analyses	6
Total firms with complete data	56
Panel B: Industries' representation of the sample firms	Industry Number of firm
Pharmaceutical and medical	6
Chemical Industries	10
Food and Beverages	11
Mining and Extraction	13
Electrical, Engineering and constructions	10
Textiles leather and clothing	6
Total	56

1- Business strategy (STR): the analysis in this study begins by dividing the sample firms into two equal clusters of business strategies; product differentiation strategy and low-cost strategy. The firms' classification is determined by the amount of

research and development costs paid during the study period. Previous studies (e.g., Jermias, 2008) have used research and development costs to determine the firms that are considered the product differentiation strategy or the low-cost strategy. The product differentiation strategy firms are the firms that have the highest average research and development costs during the study period while the low-cost strategy firms are the firms that have the lowest average research and development costs. We considered firms that incurred higher research and development costs than the market median as high research and development costs firms, while firms that incurred lower research and development costs than the market median as a low research and development costs firms. Cluster 1 has 28 firms and cluster 2 has 28 firms as well. Business strategy is considered in cluster 1 for firms with high research and development costs, and 0 for firms with zero or low research and development costs. A *t*-test indicates that cluster 1 has a significantly higher ratios of research and development costs ($t = 11.153$, $p < 0.001$) than cluster 2. Therefore, cluster 1 is defined as a product differentiation group and cluster 2 as a low-cost group.

2- Competitiveness of product (COM): Competitiveness of the product refers to the degree of competition a firm faces in a particular market (Jaworski and Kohli, 1993). Competitiveness depends on the distribution of the market share of the firms in a specific sector. When the market share among the firms in one sector is tight, the competitiveness among these firms is high. Increasing the number of firms in one sector leads to close the market share among these firms. Different researchers use different ways to calculate market share. Nawrocki and Carter (2010), for example, uses market capitalization data. They argue that market capitalization data avoids the problem of dependence on accounting conventions. In addition, they expect that the best test for the existence of monopoly power within an industry is to acquire and analyze costs and demand data for firms within an industry. Curry and George (1983) note that cost and demand data are difficult to analyze effectively. Even when the data are obtainable, Dickson (1994) notes that cost and demand data need to be adjusted for firm size. Geronikolaou (2015) and Thorburn (2008), on the other hand, use a firm's market share as the ratio of its revenue to the respective sector's total revenue. Since it is commonly used in the literature and its availability, we follow Geronikolaou, 2015, to calculate market share. The ASE guide is used to classify the sectors and to calculate the market

share for each year and each sector. The market share then is calculated by taking each company's sales over the period and dividing it by the total sales of the sector over the same period.

Previous studies use Herfindahl index (*H*1) to measure the competitiveness of product (e.g. Nauenberg et al., 1997). The value of *H*1 is the sum of squares of the market shares held by all firms in a specific sector multiplied by 100. It is calculated as follows:

$$H1 = \sum_{i=1}^{n} (\text{marketshare}i * 100)^2$$

where market share for each firm is the sales revenue for a firm in specific year divided by the total sales revenue for all industry firms in that year, $_i$ refers to an individual firm in a specific sector and *n* refers to the number of firms in that sector. As discussed above, higher competitiveness leads to a greater number of firms and closer and lower market share. This means that *H*1 will decrease. In other words, low *H*1 means more competitions and less returns. *H*1 is considered the benchmark to recognize a higher or lower competitiveness firm. Firms with *H*1 greater than the median of the calculated Herfindahl index are considered to be lower competitiveness firms, while firms with *H*1 are smaller than the median of the calculated Herfindahl index are considered to be higher competitiveness firms.

3- Financial leverage (LEV): financial leverage of firms determined by the ratio of average total debt to book value of average total assets.

4- Control variables: we use seven control variables in this study to verify that these variables do not affect the results of studying the relationship between leverage and the firm performance. The first control variable used is the size of the firm (SIZE). The size is determined as the natural logarithm of the average total assets of firms. The size of a firm is considered to be an important determinant of firm's performance. According to Shephard (1970), larger firms may be able to leverage their market power, thus having effect on their profitability. As a result, we expect a positive relationship between a firm's size and its performance. The second is the sales growth (SG). Sales growth is determined as a one-year growth rate of sales of firms. The sales growth is another important determinant of a firm's performance; Zeitun and Tian (2007) argue

that firms with growth opportunities are able to generate profit from their investment. Therefore, we expect a positive relationship between sales growth and the firm's performance. The third is efficiency (EFF). Efficiency is determined as the ratio of sales revenue divided by the average total assets of firms. The efficiency of a firm can be measured by the way the management utilizes the assets of the firm to increase the profit of the firm. We expect that a positive relationship exists between the efficiency and firm performance. The fourth is the assets tangibility (TANG). Assets tangibility is determined as the ratio of average net fixed assets divided by average total assets of firms. Asset tangibility is considered another determinant of a firm's performance. We argue that a firm which retains large investments in tangible assets will have larger costs of depreciation and maintenance than a firm that relies on intangible assets. Hence, we expect a negative relationship between asset tangibility and a firm's performance. The fifth control variable used is the firm's age (AGE). The firm's age is determined as the natural logarithm of the number of years of operation since the year was incorporated to each year of the period under study. The age of a firm may also affect the firm's profitability. Older firms have more experience in the market and can avoid the liabilities of newness. Therefore, we expect a positive relationship between age and a firms' performance. The sixth control variable used is the percentage change in number of employees (EMP) determined as a one-year growth rate of number of employees of firms. The last control variable is the percentage change in fixed assets (FA) determined as one-year growth rate of net fixed assets of firms. EMP and FA are added as control variables as the firms' competitive strategies are now considered a part of the value chain innovations by which firms could either reduce their operational costs or differentiate their products and services from others through value appreciation in the value chain. We expect positive relationship between both the EMP, FA and the firms' performance.

4. Data analysis and results

4.1. Descriptive statistics and correlations

Panel A of Table (2) reports distributional statistics and panel B contains Pearson and Spearman correlations. Panel A of Table (2) shows that, on an average, the ROA is 1.52% while the average EVA is -0.21%. The low performance for the sample is due to

the fact that the firms were affected by the Arab spring period during the study period. This decline is a general phenomenon for all the Amman Stock Exchange firms and other exchange stock markets in the region. In addition, the significant decline in oil prices during the study period has a negative effect on the firms' performance.

We use the logarithmic function for the size and age variables to transform the skewedness in these variables into a more symmetrical data distribution. The Shapiro-Wilk test accepts the hypothesis of normality distribution for all variables except business strategy (STR). This is expected since STR is a dummy variable. The Augmented Dickey-Fuller unit root test which uses the intercept only model rejects the null hypothesis that the variables are not stationary or have unit roots. We find similar results as well when using the trend and intercept model or no trend, no intercept model. These results indicate no serial autocorrelations in all variables. The ARCH LM test statistic results for the number of observations multiplied by R-square value for 1 lag are 27.135 and 25.645 for the ROA and EVA respectively. Under the null hypothesis, the critical value of $\chi 2$ (10) distribution of 1% significant is 23.21. This means that the ARCH heteroscedasticity test accepts the null hypothesis. This result shows that the variance of the disturbance terms remain constant overtime. In other words, the series is homoscedastic.

Panel B of Table (2), shows the Pearson (top), Spearman (bottom) correlations among the variables used in the study. The results show that some variables are significantly correlated with each other. In addition, the results show that Pearson and Spearman correlations are close. As in a few previous studies (e.g. Myers, 1977 and Jermias 2008), the correlation between leverage and performance is negative and significant, which indicates that debt financing creates investment problems and encourages the shareholders to not share their investments with debt holders.

Table 2. Descriptive statistics for the sample of 224 firm-year observations from the Amman Stock Exchange Market, 2011-2014.

Panel A: Distributional statistics

Variable	Mean	Median	Min.	Max.	St. Dev.	N	Shapiro-Wilk W_F	ADF *t*-statistic	ARCH LM N*R-squared
ROA	0.015	0.010	-0.46	0.38	0.113	224	0.9127***	9.539***	27.135***
EVA	-0.002	0.005	-0.47	0.36	0.093	224	0.925***	9.947***	25.645***
STR	0.502	1.000	0.00	1.00	0.501	224	0.9997	6.087***	
COM	2.967	2.950	2.58	3.30	0.287	224	0.9165***	3.486**	
LEV	0.379	0.310	0.00	0.93	0.384	224	0.0556***	14.990***	
SIZE	16.752	16.66	13.61	21.31	0.814	224	0.9474***	5.348***	
SG	0.191	0.000	-0.91	11.27	1.338	224	0.2477***	19.965***	
EFF	0.617	0.580	0.02	2.69	0.468	224	0.8269***	6.197***	
TANG	0.667	0.680	0.18	0.90	0.587	224	0.9201***	7.047***	
AGE	2.903	3.000	0.69	4.19	0.377	224	0.947***	3.514***	
EMP	0.017	0.024	-0.44	0.57	0.126	224	0.846***	6.536***	
FA	-0.004	-0.024	-0.38	0.65	0.123	224	0.907***	11.857***	

Panel B: Pearson (top), Spearman (bottom) correlations among variables (n=224)

	ROA	EVA	STR	COM	LEV	STR*LEV	COM*LEV	SIZE	SG	EFF	TANG	AGE	EMP	FA
ROA		.996***	.093	.028	-.428***	-.020	.024	.206**	.130	.105	.476***	.036	.132*	.149*
EVA	.987***		.151*	-.055	-.339**	.162*	.065	.115	-.069	.039	.074	.063	.113	.126
STR	-.042	.112		-.193**	.187*	.436***	-.066	.238**	.008	.176*	.066	.191**	-.034	.091
COM	.029	-.063	.196**		.215**	-.195**	.059	-.181*	-.035	-.108	-.114	-.403***	.186*	.046
LEV	-.336**	-.230**	.321**	-.206**		.070	-.069	.095	-.045	.316**	.573***	.123	-.018	.105
STR*LEV	-.059	.111	.826***	-.247**	.314**		-.006	.154*	-.025	.189*	.103	.208**	.005	.282**
COM*LEV	-.100	.136*	-.018	-.004	-.143*	.230**		.016	.006	-.077	.033	.009	.083	-.024
SIZE	.148*	.078	.372***	-.178*	.251**	.380***	-.037		.029	.269**	-.043	.128*	-.034	.013
SG	.266**	-.081	-.057	.045	.020	-.042	-.008	.024		.193**	.041	-.185*	-.013	-.066
EFF	.261**	.018	.220**	-.044	.282**	.185*	-.164*	.165*	.307**		.102	.211**	-.012	.096
TANG	.143*	.007	.057	-.119	.181*	-.048	-.108	.060	.038	-.002		.047	-.071	-.019
AGE	.128*	.081	.197**	-.572***	.141*	.229**	.011	.101	-.142	.194**	-.059		-.181*	.013
EMP	.133*	.124	-.038	.154*	-.063	-.060	.110	-.021	-.012	-.017	-.058	.152*		.085
FA	.147*	.118	.106	.051	.120	.083	-.030	.044	-.035	.005	-.063	-.006	.079	

*ROA is the performance of firms measured as sales revenue less cost of goods sold divided by its average total assets. EVA is the economic value added determined by the difference between net operating profit after tax and the product of invested capital and weighted average cost of capital. STR is = 1 for firms with high research and development costs, and 0 for firms with zero or low research and development costs. COM is the logarithmic function of the Herfindahl index based on ASE market's classifications for the manufacturing firms. LEV is financial leverage of firms determined by the ratio of average total debt to book value of average total assets. STR*LEV is the interaction between STR and LEV. INT*LEV is the interaction between INT and LEV. SIZE is the natural logarithm of average total assets of firms. SG is the one-year growth rate of sales of firms. EFF is the firm's efficiency determined by the ratio of sales revenue divided by average total assets of firms. TANG is the assets tangibility determined by the ratio of average net fixed assets divided by average total assets of firms. AGE is natural logarithm of age of firms measured by the number of years of operation since the year was incorporated to each year of the period under study. EMP is the percentage change in employee during the year. FA is the percentage change in fixed assets during the year.*

****significant at the 0.01 level, **significant at the 0.05 level, *significant at the 0.10 level (2-tailed).*

4.2. Testing the hypotheses

The Hausman fixed random test is used in all models in this study to determine whether to use fixed effects or random effects. The χ^2 Hausmans reject the null hypothesis that the differences in coefficients are not systematic. These results mean that fixed effects is not appropriate for our study. The Breusch and Pagan LM test is then used to test for random effects. The results in all models used in this study also reject the null hypothesis that there are significant differences across the years and conclude that there is no need to use random effects for our data. Therefore, we apply the General Least Square model.

Table 3. Regression results of performance (ROA) on leverage (LEV), size (SIZE), sales growth (SG), efficiency (EFF), tangibility (TANG), and age (AGE)

Model 1: $ROA_{it} = \alpha_0 + \alpha_1 LEV_{it} + \alpha_2 SIZE_{it} + \alpha_3 SG_{it} + \alpha_4 EFF_{it} + \alpha_5 TANG_{it} + \alpha_6 AGE_{it} + \varepsilon_{it}$ **(1)**

Variables	Prediction	Coefficients	*t*-values	Sig.	VIF
Intercept		-0.292	-2.665***	0.008	
LEV	-	-0.354	-3.395***	0.000	1.038
SIZE	+	0.032	2.126**	0.035	1.089
SG	+	0.012	1.653*	0.100	1.052
EFF	+	0.236	3.843***	0.000	1.118
TANG	-	-0.095	-6.102***	0.000	1.033
AGE	+	-0.001	-1.183	0.239	1.104
Adjusted R^2			0.649		
F statistics			35.159***	Prob. = 0.0000	
Hausman fixed random $\chi^2(6)$			5.61	Prob. = 0.4679	
Breusch and Pagan LM			1.92*	Prob. = 0.0828	
Modified Wald $\chi^2(56)$			9246.97***	Prob. = 0.0000	
Pasaran CD			1.001	Prob. = 0.3169	
Wooldrige F(1,55)			0.029	Prob. = 0.8643	
Jargue-Bera χ^2			169.59***	Prob. = 0.0000	
Wald F-test for coefficient restriction			572.75***	Prob. = 0.0000	
Sample size			224		

All variables are as defined in Table 2.

****significant at the 0.01 level, **significant at the 0.05 level, *significant at the 0.10 level (2-tailed).*

Table 3 reveals the results of Model 1 from the panel regression analysis of the panel data set. The results show that α_1 is negative and significant. As expected, this result supports the idea that debt financing creates investment problems and the shareholders thought that debt is not able to cover its costs and extra returns to improve the performance of the firms. In addition, the results show that α_2, α_3, and α_4 are positive and significant. The large size adds more return to the firms' assets. Similarly, firms with a high sales growth and assets turnover have better performance. The better the management utilizes the assets, the better will be the performance. Asset tangibility has a negative and significant correlation with the firms' performance. This means that increasing investment in the intangible assets will generate more profit. Finally, the results show that α_6 is insignificant. This means that older firms do not add value to the firms' performance. We think the reason for that is that the older firms may have a seniority advantage during a specific certain time of its foundation, and they will lose this advantage as other competitors become senior in the market. Hausman fixed random test show that fixed effects is not appropriate to Model 1. Breusch and Pagan's LM test shows no need to use random affects for the data used. Modified Wald test for heteroscedasticity rejects the null of heteroscedasticity. Pasaran cross-sectional dependence test rejects the null hypothesis that residuals are correlated. Wooldrige's test for autocorrelation in panel data reject the null hypothesis of first order autocorrelation. The Jargue-Bera (JB) test does not reject the null hypothesis that residuals are normally distributed. The Wald F-test on the linear restriction results rejects the null hypothesis that all coefficients are equal to zero. Variance Inflation Factor (VIF) test indicates no impact of multicollinearity. Consistent with Jermias (2008), the results indicate that the financial leverage is negatively related to the firms' performance. In summary, the results in Table 3 support the first hypothesis which states that the leverage has a negative and significant relationship with the firm's performance. Table 4 shows the results of Model 2 from the panel regression analysis of the panel data set (without interaction terms). The Table shows the effects of independent variables on firm performance. Hausman fixed random tests to show that fixed effects is not appropriate to Model 2. Breusch and Pagan's LM test shows no need to use random affects for the data used. Modified Wald test for heteroscedasticity rejects the null of heteroscedasticity. Pasaran's cross-sectional dependence test rejects the null hypothesis that residuals are correlated. Wooldrige test

for autocorrelation in panel data rejects the null hypothesis of the first order autocorrelation. The Jargue-Bera (JB) test does not reject the null hypothesis that residuals are normally distributed. The Wald F-test on the linear restriction results reject the null hypothesis that all coefficients are equal to zero. The Variance Inflation Factor (VIF) test indicates no impact of multicollinearity.

The results in Table 4 are similar to that in Table 3. The coefficients of STR and COM variables are insignificant. To test the effect of the business strategy and degree of competitiveness on the relationship between the financial leverage and firms' performance, Cohen et al. (2003) and Jermias (2008) suggest adding the interaction of leverage with the business strategy and the degree of competitiveness, i.e., use model 3.

Table (5) shows the results of Model 3 from the panel regression analysis of the panel data set (with interaction terms). It presents the regression results of performance (ROA) on the business strategy (STR), competitiveness (COM), leverage (LEV), product of business strategy and leverage (STR*LEV), product of competitiveness and leverage (COM*LEV), size (SIZE), growth (SG), efficiency (EFF), tangibility (TANG), age (AGE), Percentage change in number of employees (EMP), and percentage change in the fixed assets (FA). Given that the interaction terms are significant, model 3 provides a better picture of the relationship between the financial leverage and the firms' performance (Jermias, 2008).

Table 4. Regression results of performance (ROA) on business strategy (STR), competitiveness (COM), leverage (LEV), size (SIZE), sales growth (SG), efficiency (EFF), tangibility (TANG), age (AGE), percentage change in employees (EMP), and percentage change in fixed assets (FA)

Model 2: $ROA_{it} = \alpha_0 + \alpha_1 STR_{it} + \alpha_2 COM_{it} + \alpha_3 LEV_{it} + \alpha_4 Size_{it} + \alpha_5 SG_{it} + \alpha_6 Eff_{it} + \alpha_7 Tang_{it} + \alpha_8 Age_{it} + \alpha_9 EMP_{it} + \alpha_{10} FA_{it} + \varepsilon_{it}$ **(2)**

Variables	Prediction	Coefficients	*t*-values	Sig.	VIF
Intercept		-0.066	-0.507	0.613	
STR	-	0.012	0.955	0.341	1.168
COM	-	-0.005	-0.174	0.862	1.597
LEV	-	-0.110	-3.990***	0.000	1.058
SIZE	+	0.033	2.964***	0.004	1.203
SG	+	0.018	1.697*	0.096	1.083
EFF	+	0.059	3.765***	0.000	1.144
TANG	-	-0.051	-3.573***	0.000	1.066
AGE	+	0.011	1.172	0.242	1.708
EMP	+	0.103	2.104**	0.037	1.060
FA	+	0.119	2.385**	0.018	1.046
Adjusted R^2			0.593		
F statistics			28.784***	Prob. = 0.0000	
Hausman fixed random $\chi^2(6)$			3.90	Prob. = 0.6898	
Breusch and Pagan LM			1.04	Prob. = 0.1543	
Modified Wald $\chi^2(56)$			14259.37***	Prob. = 0.0000	
Pasaran CD			0.873	Prob. = 0.3829	
Wooldrige F (1,55)			0.025	Prob. = 0.8738	
Jargue-Bera χ^2			215.639***	Prob. = 0.0000	
Wald F-test for coefficient restriction			523.13***	Prob. = 0.0000	
Sample size			224		

All variables are as defined in Table 2.

****significant at the 0.01 level, **significant at the 0.05 level, *significant at the 0.10 level (2-tailed).*

Table 5. Regression results of performance (ROA) on business strategy (STR), competitiveness (COM), leverage (LEV), product of business strategy and leverage (STR*LEV), product of competitiveness and leverage (COM*LEV), size (SIZE) , sales growth (SG), efficiency (EFF), tangibility (TANG), age (AGE), percentage change in employees (EMP), and percentage change in fixed assets (FA).

Model 3: $ROA_{it} = \alpha_0 + \alpha_1 STR_{it} + \alpha_2 COM_{it} + \alpha_3 LEV_{it} + \alpha_4 STR*LEV_{it} + \alpha_5 COM*LEV_{it} + \alpha_6 Size_{it} + \alpha_7 SG_{it} + \alpha_8 Eff_{it} + \alpha_9 Tang_{it} + \alpha_{10} Age_{it} + \alpha_{11} EMP_{it} + \alpha_{12} FA_{it} + \varepsilon_{it}$ **(3)**

Variables	Prediction	Coefficients	*t*-values	Sig.	VIF
Intercept		-0.051	-0.397	0.692	
STR	-	0.007	0.483	0.630	1.546
COM	-	-0.066	-1.680*	0.099	1.622
LEV	-	-0.109	-3.928***	0.000	1.077
STR*LEV	-	-0.041	-1.972**	0.048	1.589
COM*LEV	-	-0.035	-2.936***	0.001	1.040
SIZE	+	0.034	1.969**	0.049	1.210
SG	+	-0.017	-1.982**	0.046	1.085
EFF	+	0.246	19.756***	0.000	1.165
TANG	-	0.095	5.964***	0.000	1.070
AGE	+	0.009	0.977	0.330	1.724
EMP	+	0.095	1.929*	0.055	1.068
FA	+	0.107	2.075**	0.039	1.126
Adjusted R^2			0.592		
F statistics			22.746***	Prob. = 0.0000	
Hausman fixed random $\chi^2(6)$			4.65	Prob. = 0.5888	
Breusch and Pagan LM			1.21	Prob. = 0.1353	
Modified Wald $\chi^2(56)$			155545.18***	Prob. = 0.0000	
Pasaran CD			1.516	Prob. = 0.1269	
Wooldrige F(1,55)			0.055	Prob. = 0.8160	
Jargue-Bera χ^2			209.511***	Prob. = 0.0000	
Wald F-test for coefficient restriction			485.74***	Prob. = 0.0000	
Sample size			224		

All variables are as defined in Table 2.

, **, * denote the significant level of 0.10, 0.05 and 0.01, respectively, based on two-tailed tests.*

Hausman fixed the random test to show that fixed effects are not appropriate to Model 3. Breusch and Pagan's LM test shows no need to use random affects for the data used. The Modified Wald test for heteroscedasticity rejects the null of heteroscedasticity. The Pasaran cross-sectional dependence test rejects the null hypothesis that residuals are correlated. The Wooldrige test for autocorrelation in the panel data rejects the null hypothesis of first order autocorrelation. The Jargue-Bera (JB) test does not reject the null hypothesis that residuals are normally distributed. The Wald

F-test on the linear restriction results rejects the null hypothesis that all coefficients are equal zero. The Variance Inflation Factor (VIF) test indicates no impact of multicollinearity. The results show that the interaction terms α_4 and α_5 are statistically significant. As expected, the results in Table 5 indicate that the financial leverage is negatively related to the firm's performance.

H2 states that the relationship between leverage and performance will be more negative for the firms that use product differentiation strategy compared with the firms that use low-cost strategy. This means that it is expected to find incremental effects of business strategy on the relationship between financial leverage and firm performance when the firms are classified as a product differentiation strategy compared with when they are classified as low-cost strategy. The results show that α_4 is negative and significant. Given that STR is = 1 for the product differentiation strategy firms and 0 for the low-cost strategy firms, α_3 represents the linear relationship between financial leverage and the firms' performance. For product differentiation firms, the relation is presented by the sum of α_3, α_4 and α_5. For low-cost firms, the relation is presented by the sum of α_3 and α_5. Assuming that COM is constant at its mean, changing the firm strategy from product differentiation to low-cost, the slope will change from -0.211 {-0.066 -0.041 + (-0.035*2.9672)} for product differentiation to -0.170 {-0.066 + (-0.035*2.9672)} for low-costs. These results support H2.

H3 states that the relationship between leverage and performance will be more negative for the firms with a high degree of competitiveness, compared to the firms with a low degree of competitiveness. This means that it is expected to find incremental effects of the degree of competitiveness on the relationship between financial leverage and the firms' performance when they are classified as highly competitive, compared with when they are classified as low competitive. The results show that α_5 is negative and significant. This means that as the level of competitiveness increases, the benefit of debt decreases. Assuming that STR is constant at its mean, moving from low competitiveness to high competitiveness is expected to change the slope of the relationship between financial leverage and the firms' performance from -0.177 {-0.066 + (-0.041*0.5021) + (-0.035*2.58)} for low competitiveness to -0.202 {-0.066 + (-0.041*0.5021) + (-0.035*3.30)} for high competitiveness. These results support H3.Regarding the control variables, the results in Table 5 are similar to that in Tables 3

and 4. The results show that α_6, α_7, and α_8 are positive and significant. As explained above, these results suggest that a large size adds more return to the firms' assets, firms with high sales growth and assets' turnover have better performance, and the better the management utilizes the assets, the better will be the performance. Asset tangibility has a negative and significant correlation with the firms' performance indicating that increasing the investment in the intangible assets will generate more profit. The results also show that α_{10} is insignificant. This means that older firms do not add value to the firms' performance. Finally, α_{11}, and α_{12} are significant at a 10% and 5% level respectively. This means that firms with a higher percentage change in the number of employees and fixed assets have a better performance. In summary, the results in Table 5 support the second and third hypotheses.

4.3. Robustness Tests

Followed by large papers in the literature, we use ROA as a dependent variable to examine the relationship between financial leverage and firm performance. Senarathne and Jianguo (2018) use Economic Value Added (EVA) as an appropriate measure of value chain as it considers the expected capital provider. As a result, we replace ROA by EVA in all the used models as follows:

Model 1: $$EVA_{it} = \alpha_0 + \alpha_1 LEV_{it} + \alpha_2 SIZE_{it} + \alpha_3 SG_{it} + \alpha_4 EFF_{it} + \alpha_5 TANG_{it} + \alpha_6 AGE_{it} + \varepsilon_{it} \quad (4)$$

Model 2: $$EVA_{it} = \alpha_0 + \alpha_1 STR_{it} + \alpha_2 COM_{it} + \alpha_3 LEV_{it} + \alpha_4 Size_{it} + \alpha_5 SG_{it} + \alpha_6 Eff_{it} + \alpha_7 Tang_{it} + \alpha_8 Age_{it} + \alpha_9 EMP_{it} + \alpha_{10} FA_{it} + \varepsilon_{it} \quad (5)$$

Model 3: $$EVA_{it} = \alpha_0 + \alpha_1 STR_{it} + \alpha_2 COM_{it} + \alpha_3 LEV_{it} + \alpha_4 STR*LEV_{it} + \alpha_5 COM*LEV_{it} + \alpha_6 Size_{it} + \alpha_7 SG_{it} + \alpha_8 Eff_{it} + \alpha_9 Tang_{it} + \alpha_{10} Age_{it} + \alpha_{11} EMP_{it} + \alpha_{12} FA_{it} + \varepsilon_{it} \quad (6)$$

Table 6 shows the results of Models 4, 5, and 6 from the panel regression analysis of the panel data set. For models 4, 5, and 6, Modified Wald test for heteroscedasticity reject the null of heteroscedasticity. Pasaran cross-sectional dependence test rejects the null hypothesis that residuals are correlated. The Wooldrige test for autocorrelation in the panel data rejects the null hypothesis of the first order autocorrelation. Jargue-Bera

(JB) test does not reject the null hypothesis that residuals are normally distributed. The Wald F-test on the linear restriction results rejects the null hypothesis that all coefficients are equal to zero. The Variance Inflation Factor (VIF) test indicates no impact of multicollinearity. The results of Model 4 show that α_1 is negative and significant. As expected, these results are similar to the result in Table 3. In addition, the results show that α_2, α_3, α_4, α_5, and α_6 are similar to that in Table 3. Model 5 results (without interaction terms) show the effects of independent variables on the firm's performance. The results are similar to that in Table 4. The coefficients of the STR and COM variables are insignificant. To test the effect of the business strategy and degree of competitiveness on the relationship between the financial leverage and firms' performance, we use model 6. In Table 6, the results of model 6 (with interaction terms) presents the regression results of the performance (EVA) on the business strategy (STR), competitiveness (COM), leverage (LEV), product of business strategy and leverage (STR*LEV), product of competitiveness and leverage (COM*LEV), size (SIZE), growth (SG), efficiency (EFF), tangibility (TANG), age (AGE), percentage change in employees (EMP), and the percentage change in fixed assets (FA). As explained earlier, given that the interaction terms are significant, model 6 provides a better picture of the relationship between the financial leverage and the firms' performance. The results show that the interaction terms α_4 is significant at a 10% level and α_5 are statistically significant at the 1% level. The results indicate that the financial leverage is negatively related to the firm's performance.

To support H2, we may expect to find incremental effects of the business strategy on the relationship between financial leverage and firm performance when the firms are classified as a product differentiation strategy compared with when they are classified as a low-cost strategy. The slope will change from -0.218 {-0.078 -0.033 + (-0.036*2.9672)} for product differentiation to -0.184 {-0.078 + (-0.036*2.9672)} for low-costs. These results support H2.

Table 6. Regression results of performance (EVA) on independent variables as defined in models 4, 5, and 6.

Variables	Model 4		Model 5		Model 6	
	Coefficients	*t*-values	Coefficients	*t*-values	Coefficients	*t*-values
Intercept	-0.295	-2.735***	-0.056	-0.434	-0.040	-0.309
STR			0.013	0.977	0.010	0.677
COM			-0.007	-0.258	-0.078	-1.835*
LEV	-0.357	-3.964***	-0.108	-3.936***	-0.106	-3.831***
STR*LEV					-0.033	-1.846*
COM*LEV					-0.036	-2.958***
SIZE	0.033	2.146**	0.035	2.993***	0.041	2.125**
SG	0.012	1.683*	0.019	1.728*	-0.018	-1.996**
EFF	0.239	3.974***	0.060	3.856***	0.235	3.475***
TANG	-0.101	-6.784***	-0.097	-3.354***	0.091	5.135***
AGE	0.009	1.171	0.010	1.051	0.008	0.869
EMP			0.098	1.983**	0.089	1.817*
FA			0.095	1.900*	0.087	1.698*
Adjusted R^2	0.649		0.593		0.525	
F statistics	35.159***		28.784***		18.647***	
Modified Wald $\chi^2(56)$	8675.84		13675.86***		135645.36***	
Pasaran CD	0.984		0.857		1.475	
Wooldrige F(1,55)	0.027		0.024		0.048	
Jargue-Bera χ^2	171.854***		209.647***		202.534***	
Wald F-test for coefficient restriction	556.65***		504.75***		456.65***	
Sample size	224		224		224	

All variables are as defined in Table 2.

, **, * denote the significant level of 0.10, 0.05 and 0.01, respectively, based on two-tailed tests.*

H3 expects to find the incremental effects of the degree of competitiveness on the relationship between financial leverage and the firm's performance when the firms are classified as highly competitive, compared to when they are classified as low competitive. The results show that the slope of the relationship between financial leverage and the firms' performance is changed from -0.187 {-0.078 + (-0.033*0.5021) + (-0.036*2.58)} for low competitiveness to -0.213 {-0.078 + (-0.033*0.5021) + (-0.036*3.30)} for high competitiveness. These results support H3. Overall, the results in Table 6 are similar to that in Tables 3, 4, and 5 and support the hypotheses.

5. Conclusions

This study tests the relationship between the financial leverage and firm performance. Previous studies have found mixed results. Some of them suggest including the effect of firms' business strategy and the degree of competitiveness on the relationship between the leverage and performance trying to solve the puzzle in the mixed results and test whether using different approaches have an effect on the results of studying the relationship between financial leverage and firm performance. Evidence on the relationship between financial leverage, firm performance, competitiveness and business strategy is generally limited especially in developing countries. This work may help in filling the gap. The study uses both ROA and EVA as two proxies for firm performance. In addition, it uses variables to control for value chain risk. This is considered very important and neglected by a number of authors in the literature.

Based on a sample from the Amman Stock Exchange, the study finds that the financial leverage has a negative relationship with firm performance. In addition, the relationship between financial leverage and performance is more negative for the firms that use product differentiation strategy compared with the firms that use low-cost strategy and for firms with a high degree of competitiveness, compared to the firms with a low degree of competitiveness. The results are consistent with O'Brien (2003) and Jermias (2008) with regard to the opinion that low-cost debt financing firms try to benefit from tax advantages and increase their efficiency due to the constraints imposed by lenders. However, these constraints are not imposed to the product differentiation firms which gives the management the ability to pay more for innovations. On the other hand, the results are inconsistent with Modigliani and Miller (1958), which suggest that financial leverage is irrelevant to the firms' performance. Grasseni (2010) provides evidence of remarkable heterogeneity in results across and within multinationals. The results of this study may have a few important implications for practitioners and management.

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