

# PRIVATE SECTOR INVESTMENT AND FINANCE: FIRM-LEVEL ANALYSES

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## ABSTRACT

*Given the economic implications of firm investment, this paper investigates a sample of listed non-financial Jordanian firms in terms of their investments in fixed assets and their capital structure. Based on a total of 76 firms, and the time-period 2007-2017, the results are not that encouraging. During the past few years, Jordanian firms have not been investing. Moreover, while their leverage ratios are low, the results indicate that debt financing positively affect their investment behavior.*

*Based on the empirical results, future research should look into the reasons why Jordanian firms maintain low levels of debt financing. In other words, is the prevailing low levels of debt due to their choice, or is it due to the banks being too conservative in their lending behavior?*

**Keywords:** Stock Exchange; Firm Investment; Leverage, Tobin's Q.

**JEL Codes:** G30; G31; G20.

## INTRODUCTION

Economic growth and development have always caught the attention of economists. This on-going effort has led to the development of several macro-level and micro-level theoretical and empirical papers. At the micro-level, two issues that still attract research papers are the investment and financing behavior of firms. Indeed, firms' investments in real assets, and their financing choices, are of great significance to their financial performance and growth.

Corporate finance analyzes a number of long-term and short-term financial decisions. These include the investment behavior of firms and their capital structure. Within this context, and at the theoretical level, the interplay between firms' leverage and their investment behavior could well be looked at in terms of what is called the underinvestment and overinvestment theories.

Myers & Majluf (1984) argued that some companies forego good growth (investment) opportunities as a result of their already existing high debt levels. It is also argued that firms with high leverage ratios tend to invest less in real assets regardless of their growth opportunities. Such firms suffer from liquidity problems (Aivazian, 2005). The interplay between leverage and investment, on the other hand, could be looked at in terms of overinvestment. As a result of the conflict of interest between shareholders and managers, the latter tend to invest and expand their firms, even at the cost of their shareholders. However, to maintain their interest, shareholders force managers to issue more debt. In other words, debt could be used as a controlling mechanism of overinvesting managers (Aivazian et al. 2005).

At the theoretical level, and notwithstanding the fact that the relationship between capital structure and investment behavior of firms can be positive or negative, the literature contains so many papers that examine the determinants of firm investment, and the determinants of the capital structure choice itself.

Some of the empirical papers that examine the impact of leverage on the investment behavior of firms include Aivazian et al. (2005); Yuan & Motohashi (2008); Bokpin & Onnumah (2009); Wang et al. (2009); Xiao (2009); Bruckner (2010); Piris (2010); Geng & N'Diaye (2012); and Reilly (2015).

More recent papers include Vatavu (2015); Akben-Selcuk (2016); Gabrijelcic et al. (2016); Lazar (2016); and Nassar (2016); Gómez (2018); Cevik & Miryugin (2018); and Gezici et al. (2018). Within this context, for example, and following their analysis of listed companies in Vietnam during the period 2006-2015, it is stated that “our results reveal a negative link between leverage and investment. This implies that debt disciplinarily constrains corporate investment” (Vo, 2018).

In general, the above-mentioned studies, and others, regress the annual change in net fixed assets (measure of firm investment) on a number of independent variables including leverage, firm age, firm performance, firm size, and Tobin's Q.

As far as the financing choice of firms is concerned, the theoretical background is due to Modigliani & Miller (1958). When markets are perfect, Modigliani and Miller (1958) show that the value of firms are independent of their capital structure choices. In other words, the extent to which they rely on debt-financing has no implications to their market capitalizations. This theoretical work has led many researchers to examine what really determines the financing choice / capital structure of firms. This literature examines the empirical implications of a myriad of theories, including the trade-off theory, agency theory, signaling theory, market timing theory, and the pecking order theory. These theories are reviewed in a recently published paper by Zhao (2018).

Some of the classical, and much quoted, papers that examine the determinants of the capital structure choice are published by Titman & Wessels (1988); Harris & Raviv (1991); Rajan & Zingales (1995). In addition, is useful to note that Singh and Hamid (1992) and Singh (1995) have encouraged researchers to examine the capital structure choice of listed firms in developing countries. This effort includes the papers by Mutenheri & Green (2002); Shah & Hijazi (2004); Klapper et al. (2006); Eldomiaty (2007); Teker et al. (2009); Bokpin (2010); Lee & Cheong (2010); Olayinka (2011); Ramjee & Gwatidzo (2012); Ganguli (2013); Koksai & Orman (2014); Omet et al. (2015); Pecina & Orsag (2015); Singh (2016); Ferrarini et al. (2017) and many others.

More recent papers include Cevheroglu-Acar (2018); and Kythreotis et al. (2018). For example, following the panel-data examination of the capital structure of Turkish firms, it is stated that “profitability, non-debt tax shield, size, tangibility, and liquidity are significant determinants of the capital structure. Moreover, we conclude that capital structure decisions of non-financial firms in Turkey are mostly consistent with the hypothesis of pecking order theory rather than trade-off theory” (Cevheroglu-Acar, 2018).

Relative to the above brief account of the literature, this paper examines the investment behavior and capital structure of 76 listed Jordanian non-financial firms. This sample contains all firms which have all the relevant data. In addition, this number (76) represent about 75% of all listed firms in 2007.

The rest of the paper is organized as follows. Following the first section (introduction), we present some basic information about the Jordanian capital market. In section 3 the data, methodology, and empirical results are presented and discussed. Finally, section 4 summarizes and concludes the paper.

## **DATA, METHODOLOGY, AND EMPIRICAL RESULTS**

This paper involves two issues: (1) How have Jordanian firms behaved in terms of their investments in real assets during the period 2007-2017. (2) What is the impact of debt financing on the behavior of Jordanian firms' investment in real assets?

To carry-out the main tasks of the paper, the following modes are estimated:

$$\text{INVESTMENT}_{i,t} = \alpha_0 + \beta_1 \text{LEVERAGE}_{i,t} + \beta_2 \text{AGE}_{i,t} + \beta_3 \text{ROA}_{i,t} + \beta_4 \text{SIZE}_{i,t} + \beta_5 \text{TOBIN}_{i,t} + \varepsilon_{i,t}$$

$$\text{INVESTMENT}_{i,t} = \alpha_0 + \beta_1 \text{DEBT}_{i,t} + \beta_2 \text{AGE}_{i,t} + \beta_3 \text{ROA}_{i,t} + \beta_4 \text{SIZE}_{i,t} + \beta_5 \text{TOBIN}_{i,t} + \varepsilon_{i,t}$$

$$\text{LEVERAGE}_{i,t} = \alpha_0 + \beta_1 \text{AGE}_{i,t} + \beta_2 \text{ROA}_{i,t} + \beta_3 \text{SIZE}_{i,t} + \beta_4 \text{TOBIN}_{i,t} + \varepsilon_{i,t}$$

$$\text{DEBT}_{i,t} = \alpha_0 + \beta_1 \text{AGE}_{i,t} + \beta_2 \text{ROA}_{i,t} + \beta_3 \text{SIZE}_{i,t} + \beta_4 \text{TOBIN}_{i,t} + \varepsilon_{i,t}$$

where INVESTMENT is the annual change in net fixed assets divided by the beginning of the year fixed assets, LEVERAGE is total liabilities to total assets or total debt to total assets, DEBT is total debt to total assets, AGE is the natural logarithm of firm age, ROA is net income divided by total assets, SIZE is the natural logarithm of total assets, TOBIN is market capitalization to book value, and  $\varepsilon$  is the error term. The subscripts  $i$  and  $t$  refer to companies  $i$  (1-76) and period (2007-2017).

At first, and to estimate the above-mentioned regression models, we used three methods and these are pooled ordinary least squares, fixed effect model, and random effect model. However, in all of our estimations, the results reflect series serial autocorrelation problems (low Durbin-Watson Statistics). This is why we used the Seemingly-Unrelated Regression in estimating all the models. Indeed, this method corrects for the arbitrary period serial correlation and the period heteroscedasticity problem between the residuals for the cross-sectional aspect of the data (76 companies).

In Table 1, we report the main descriptive statistics of the investment behavior of our sample of firms and their capital structure choice. In addition, we report, in Table 2, the mean annual values of these variables. Based on the reported figures, the following comments / observations are worth raising.

First, the overall mean value of firm investment is equal to 1.8%. Relative to any standard, this is low. However, what is more discouraging is the fact that during the last three years (2015-2017), our group of companies did not invest. Their mean values of net investments are equal to -0.6%, -0.06%, and -0.58% respectively (Table 2).

Second, the leverage ratios of our sample of firms are relatively. For example, when total liabilities to total assets is used (LEVERAGE), the overall mean value of 34.3% (Table 1). This is much lower than those in, for example, in China (56%), Turkey (58%), Cyprus (49%), Germany (61%), and the 58% in 24 emerging economies (IMF, 2016). The overall mean ratio of total debt to total assets (DEBT) is even lower 16.3%. This ratio is so much lower than the 61.7% ratio that prevails in a group of eight European countries (OECD, 2017). Similarly, this ratio (16.3%) is lower than the overall mean ratio of 67.4% that is reported for Italy, Spain, Greece, Portugal, and Slovenia (European Central Bank, 2017). As far as long-term debt to total assets ratio is concerned (long debt), while the overall mean value is extremely low (4.6%), it is important to note that most of the firms do not have this financing (long-term debt) on their books.

INVESTMENT is the annual change in net fixed assets divided by the beginning of the year fixed assets, LEVERAGE is total liabilities to total assets, DEBT is total debt to total assets, and LONG DEBT is long-term debt to total liabilities.

<b>Table 1</b>				
<b>DEPENDENT VARIABLES: DESCRIPTIVE STATISTICS</b>				
<b>Measure</b>	<b>INVESTMENT</b>	<b>LEVERAGE</b>	<b>DEBT</b>	<b>LONG DEBT</b>
Mean	0.018	0.343	0.163	0.046
Median	-0.022	0.305	0.131	0.003
Maximum	1.425	1.345	0.700	0.589
Minimum	-0.971	0.019	0.000	0.000
Std.Deviation	0.221	0.209	0.152	0.080

INVESTMENT is the annual change in net fixed assets divided by the beginning of the year fixed assets, LEVERAGE is total liabilities to total assets and DEBT is equal to total debt to total assets.

<b>Table 2</b>			
<b>DESCRIPTIVE STATISTICS</b>			
<b>Year</b>	<b>INVESTMENT</b>	<b>LEVERAGE</b>	<b>DEBT</b>
2008	0.024	0.303	0.152
2009	0.017	0.305	0.144
2010	0.108	0.312	0.150
2011	0.014	0.315	0.147
2012	0.016	0.332	0.165
2013	0.031	0.351	0.171
2014	0.037	0.363	0.175
2015	-0.006	0.366	0.180
2016	-0.006	0.399	0.176
2017	-0.058	0.388	0.172

Third, the large difference between total liabilities to total assets and total debt to total assets implies that our sample of firms maintain large proportions of their liabilities in the form of accounts payable.

In addition to the above-mentioned three observations, and during the examined period, LEVERAGE and DEBT did not reflect much variations. However, we can state that, on average, they increased, albeit by small proportion (Table 2).

As far as the independent variables are concerned (Table 3), two observations are worth raising. AGE is the natural logarithm of firm age, ROA is net income divided by total assets, TOBIN is the market value of subscribed shares to their book value, SIZE is the natural logarithm of total assets, and TANG is the ratio of fixed assets to total assets.

<b>Table 3</b>					
<b>INDEPENDENT VARIABLES: DESCRIPTIVE STATISTICS</b>					
<b>Measure</b>	<b>AGE</b>	<b>ROA</b>	<b>TOBIN</b>	<b>SIZE</b>	<b>TANG</b>
Mean	3.103	0.012	1.342	16.819	0.395
Median	3.044	0.028	1.150	16.713	0.370
Maximum	4.357	0.635	5.828	21.311	0.959
Minimum	0.693	-0.968	0.440	13.207	0.006
Std. Deviation	0.623	0.124	0.689	1.465	0.233

First, there are large differences between our sample of firms' age, return on assets, size, and asset tangibility. These can be seen from their respective minimum and maximum values, and their standard deviations.

Second, it is interesting that our sample of firms contain firms whose market capitalizations are lower than their book values (TOBIN less than unity).

The estimation results of the four models are reported in Tables 4 and 5 below. Again, based on the reported coefficients, the following comments are worth raising.

### DETERMINANTS OF FIRM INVESTMENT

First, interestingly, the coefficient of total liabilities to total assets (LEVERAGE) is positive and significant (Table 4). Even more interesting is the fact that when debt to total assets (DEBT) is used, its coefficient is larger in magnitude (+0.159). This is what one might expect because the chances of using bank debt for investment purposes make more sense than using accounts payable.

Second, the coefficients of TOBIN are not significant. Again, and as has been reported in section 2, the ASE has been experiencing consistent falls in its indices. Such an environment does not encourage listed firms to finance their investments (if any) from issuing stocks.

Third, the coefficient of firm profitability (return on assets) is positive and significant. This indicates that more profitable companies rely on their retained profits in financing their investment activities. Again, this is expected given the low values of market capitalization to book value (Tobin).

Fourth, company age and company size are not significant factors in impacting investment. LEV is total liabilities to total assets or total debt to total assets (DEBT), AGE is the natural logarithm of firm age, ROA is net income divided by total assets, TOBIN is the market value of subscribed shares to their book value, and SIZE is the natural logarithm of total assets.

Table 4			
REGRESSION (SUR) RESULTS: DETERMINANTS OF FIRM INVESTMENT			
Dependent Variable: INVESTMENT		Dependent Variable: INVESTMENT	
Variable	Coefficient	Variable	Coefficient
LEV	0.116*	DEBT	0.159*
AGE	-0.004	AGE	-0.005
ROA	0.492*	ROA	0.481*
TOBIN	0.007	TOBIN	0.011
SIZE	-0.001	SIZE	-0.001
Adj. R <sup>2</sup>	0.089	Adj. R <sup>2</sup>	0.089
F-Statistic	17.965*	F-Statistic	18.106*
D-W Statistic	2.001	D-W Statistic	2.002
*Implies significance at the 99% confidence level.			

### Determinants of Capital Structure

First, the coefficient of firm age (AGE) is significant and negative when debt financing, and not total liabilities, is used as the measure of leverage. With time, the track record of firms is expected to improve and this might make debt finance easier for older firms. It can also be argued that with time, firms' retained earnings might improve and this makes internal easier. In other

words, the relationship between firm age and leverage could be either positive or negative. In the case of our sample of Jordanian firms, this relationship is negative.

LEVERAGE is total liabilities to total assets, DEBT is total debt to total assets, AGE is the natural logarithm of firm age, ROA is net income divided by total assets, TOBIN is the market value of subscribed shares to their book value, SIZE is the natural logarithm of total assets, and TANG is fixed assets to total assets (asset tangibility).

<b>Table 5</b>			
<b>REGRESSION (SUR) RESULTS: DETERMINANTS OF CAPITAL STRUCTURE</b>			
<b>Dependent Variable: LEVERAGE</b>		<b>Dependent Variable: DEBT</b>	
<b>Variable</b>	<b>Coefficient</b>	<b>Variable</b>	<b>Coefficient</b>
AGE	0.023	AGE	-0.027**
ROA	-0.303*	ROA	-0.198*
TOBIN	-0.015	TOBIN	-0.020
SIZE	0.017*	SIZE	0.016*
TANG	-0.009	TANG	0.001
Adj. R <sup>2</sup>	0.181	Adj. R <sup>2</sup>	0.177
F-Statistic	47.157*	F-Statistic	45.807*
D-W Statistic	1.854	D-W Statistic	1.875
• * and ** imply significance at the 99 and 95% confidence levels respectively.			

Second, interest payments are tax deductible. As a result, more profitable companies tend to have higher levels of debt (Modigliani and Miller, 1963). Myers and Majluf (1984), on the other hand, argue that as a result of asymmetric information (pecking order hypothesis), companies prefer to use internal sources of finance. Based on the results reported in Table 5, the impact of firm profitability on leverage is consistently negative and significant. This indicates that more profitable companies tend to have lower debt levels and higher retained earnings. Our sample of firms tend to rely on their retained earnings.

Third, the impact the market value of subscribed shares to their book value is consistently insignificant. The market timing hypothesis argues that if the market to book ratio is high, equity financing becomes more attractive than debt financing. However, the fact that stock prices on the ASE have been falling (Figure 4), one cannot expect firms (during the period 2007-2017) to be active issuers of equity.

Fourth, the coefficient of firm size (SIZE) is consistently positive and significant. This result supports the trade-off theory. Larger firms are more likely to be more diversified, and as a result, tend to find it easier to obtain debt financing.

Finally, the coefficients of the structure of assets (TANG) are consistently insignificant. Based on the trade-off theory, a positive relationship between debt and tangibility is expected. The pecking order theory, on the other hand, argues that firms with higher proportions of fixed assets have less information asymmetry. As a result, such firms tend to have lower levels of debt. In our sample of firms, these arguments are not accurate.

## SUMMARY AND CONCLUSIONS

This paper has examined the investment behavior and capital structure of a sample of listed non-financial Jordanian firms during the period 2007-2017. Based on the estimated results, it is reported that listed firms in Jordan maintain relatively low levels of leverage (liabilities or bank debt), and hardly have long-term on their books. Performance negatively affects their debt levels. In addition, the recent performance of our sample of firms in terms of investment has been

disappointing. What is encouraging, however, is the positive impact of leverage, especially in its bank debt form, on investment activity.

Banks (corporate credit departments), as well the listed themselves must look into the reasons behind the low leverage ratios of their customers. Is it due to the management of the banks being too conservative? Is it due to the companies themselves in that they do not have profitable investment opportunities, and hence do not seek debt? Either way, the only way to understand this issue is to develop a relevant questionnaire and distribute to the banks and firms themselves.

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