

Does Financial Leverage Induce Investment? Evidence From Listed Manufacturing Companies in Vietnam

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Abstract: We conduct an empirical test to examine the relationship between financial leverage and investment, as well as the influence of growth on this association in Vietnamese listed manufacturing companies in the 2012-2018 period. Using fixed effect model for a panel data of 122 listed manufacturing firms in Hochiminh Stock Exchange, we find a negative relationship between long-term financial leverage and investment for high-growth firms, which is consistent with the debt-overhang and risk-avoiding hypotheses. The role of financial leverage in reducing overinvestment is not confirmed in low-growth firms, contrary to the argument of leverage as a financial discipline in investment decision.

Key words: financial leverage; investment; growth; manufacturing listed companies; Vietnam

JEL code: G3

1. Introduction

The association between financial leverage and investment decision has been a debating topic in corporate finance. Modigliani and Miller (1958) argue that the interaction between financial leverage and investing opportunities is irrelevant in the perfect capital market. However, in imperfect capital market, the agency problem results in the conflicts of interest among managers, shareholders and debtholders. Those conflicts produce the overinvestment and underinvestment problems, in which the influence of debt on investment decision proves relevant (Jensen, 1986; Jensen & Meckling, 1976; Myers, 1977). In addition, the effect of financial leverage on investment activity can vary between high-growth and low-growth firms (Brito & John, 2002; Aivazian et al., 2005).

While numerous empirical researches have been conducted in foreign markets to investigate the relationship between financial leverage and investment, few studies in Viet Nam examine this topic, and the effect of growth opportunity on the association between financial leverage and investment remains scant. This paper extends the previous literature in Viet Nam by examining the relationship between debt and investment in listed manufacturing companies, with the inclusion of growth opportunity's effect.

The paper contributes to the literature by examining the manufacturing firms in Viet Nam, which is a transitional market characterized by an incomplete economic environment. In incomplete markets, agency problem may give rise to different association between financial leverage and investment (Aivazian et al., 2005).

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Our study reveals no link between indebtedness and investment in low-growth firms, in contrary to the argument of leverage as a financial constraint on investment.

The rest of the paper consists of 4 sections. Section 2 provides an overview of relevant literature. Data and empirical methodology are described in section 3. Section 4 presents the regression results and discussions. Finally, section 5 concludes the paper.

2. Related Literature

Jensen (1986, 1989) argues that financial leverage is negatively associated with investment since debt can be used to reduce the overinvestment problem. Overinvestment is one of the agency problem arising from the separation of management and ownership, which leads to the conflict of interest between managers and shareholders. It is the problem created by the manager's decision to invest in negative NPV projects or risky projects, which is against the best interest of shareholders (Jensen & Meckling, 1976; Galai & Masulis, 1976; Jensen, 1986; Stultz, 1990). The underlying reason for the overinvestment behavior is that managers attempt to use the firm to expand their human capital and raise their private profits (Zingale, 1998; Jostarndt, 2002; Rocca et al., 2007). With financial leverage, however, managers have to fulfill the obligation of interest and principal repayment to the creditors. The obligation of debt service plays the role of a financial discipline to managers, forcing them to be more cautious in using the company's resources. Hence, investment is likely to fall.

On the other hand, borrowing may stimulate managers (and shareholders) to engage in overinvestment in risky projects (Jensen & Meckling, 1976) This derives from the conflict between shareholders and debtholders, whereby shareholders, once debt has been obtained, are tempted to undertake projects that have higher riskiness than the firm's average risk level. Shareholders gain if the project turns out to be profitable, and with limited liability, only lose their contribution to the firm in case of inefficient investment. This selfish strategy is described as risk-shifting or asset substitution, in which earnings are transferred from debtholders to shareholders (Galai & Masulis, 1976). In this sense, financial leverage is positively associated with investment.

The agency problem between shareholders and debtholders causes another consequence named "underinvestment" (debt-overhang problem). Myers (1977) postulates that debt financing may result in the managers (and shareholders) to reject positive net present value projects. Shareholders of firms with risky debt may be reluctant to invest in projects that would mostly benefit the firm's debtholders. The net present value of those projects, while positive, may just be sufficient to service debt and therefore, is unlikely to bring any value to shareholders. Hence, firms with high indebtedness tend to narrow down their investment activities.

When growth opportunity is taken into consideration, there are conflicting arguments about the influence of growth on the association between financial leverage and investment. The constraint of debt on managerial investment decision is normally considered tighter in low-growth firms. Aivazian et al. (2005) postulate that firms with ample growth opportunities have higher expected cash flows, which enable them to raise money from the capital market more easily than those with limited growth prospect. The role of leverage as a financial discipline in controlling the agency problem is attenuated, as a result, the negative association between debt and investment would be weaker in high-growth firms.

On the other hand, Brito and John (2002) argue that highly levered firms with future growth opportunities tend to adopt conservative investment policy, since they want to keep the firm away from financial distress until the growth opportunity can be realized. In other words, future growth prospect stimulates risk avoidance attitude.

In contrast, highly indebted firms with limited growth prospect are more likely to invest in risky projects.

While theories produce various arguments on the effect of financial leverage on investment, extant empirical studies seem to provide consistent results. Mc Connell and Servaes (1995) conduct a survey in United States enterprises for the years 1976,1986 and 1988 and find that financial leverage stimulates underinvestment and control the overinvestment behavior in those firms. Lang et al. (1996) confirm the substantial negative association between debt and investment in low-growth US industrial firms in the 1970-1989 period. Aivizian et al. (2005) examine 863 Canadian enterprises from 1982 to 1999 and assert the negative relationship between debt financing and investment. Similar results can also be found in other studies, for example, Lang, Ofek, and Stulz (1996), Firth et al (2008), Dang (2011) and Vo (2019)

The effect of growth on the link between leverage and investment is mixed in the literature. Aivizian et al. (2005) find a more pronounced negative association between debt and investment in firms with limited growth opportunities. Meanwhile, Vo (2019) examines the link between leverage and investment among listed firms Ho Chi Minh City stock exchange over the period 2006–2015 and reports a stronger negative impact of debt on corporate investment for firms with high growth opportunities than for firms with low growth opportunities.

3. Data and Methodology

We use data of 122 Vietnamese listed manufacturing firms on Hochiminh Stock Exchange (HOSE) from 2012 to 2018. Data are obtained from Vietstock Database.

In this paper, we use two measures of financial leverage. One measure is the book value of total liabilities divided by book value of total assets, and the other is the book value of long-term debt divided by book value of total assets. Growth opportunities is proxied by Tobin’s Q, which is measured by the market value of total assets of the firm divided by the book value of assets. Cash flow is defined as earnings before interest and depreciation. Finally, size is measured by natural log of total assets.

Table 1 Descriptive Statistics

	Mean	Min	Max	Standard deviation
Net investment/Net fixed asset _{t-1}	-0.004	-442.69	109.6	18.84
(Total liabilities/Total assets) _{t-1}	0.47	0.007	0.96	0.19
(Long-term debt/Total assets) _{t-1}	0.07	0	0.60	0.10
Cash flow/Total assets _{t-1}	0.15	-0.21	2.72	0.19
(Net sales/Net fixed assets) _{t-1}	8.70	0	128.53	13.29
Tobin’s Q _{t-1}	1.25	0.40	9.04	0.81
Size _{t-1}	27.92	25.09	31.92	1.22

Table 1 provides the descriptive statistics of the variables. There is a high variation in the investment of listed manufacturing firms in the 2012-2018 period. The mean investment is -0.004 while the standard deviation is 18.84. Firms in our sample rely mainly on short-term debt, since the average long-term debt over total assets stays at 0.07, while the ratio of total liabilities over total assets is 0.47. Tobin’s Q averages at 1.25, indicating a high market expectation of growth for manufacturing firms in the study period.

To examine the effect of financial leverage on investment, we follow Aivizian et al. (2005)’s model, and (Haque, 2014) to add firm size as an additional control variable. The model specification is as follow:

$$I_{i,t}/K_{i,t-1} = \alpha + \lambda_t + \beta_1 (CF_{i,t}/TA_{i,t-1}) + \beta_2 Q_{i,t-1} + \beta_3 LEVERAGE_{i,t-1} + \beta_4 (SALE_{i,t-1}/K_{i,t-1}) + \beta_5 SIZE_{i,t-1} + \mu_i + \varepsilon_{i,t} \quad (1)$$

Where $I_{i,t}$ is the net investment of firm at time t ; $K_{i,t-1}$ is the lagged net fixed assets; CF_{t-1} the cash flow of firm at time t ; $TA_{i,t-1}$ is the lagged total assets; $Q_{i,t-1}$ is lagged Tobin's Q; $LEVERAGE_{i,t-1}$ is lagged leverage; $SALE_{i,t-1}$ is lagged net sales; $SIZE_{i,t-1}$ is lagged firm size, α is the intercept; λ_t a set of year dummies to control for time fixed effects; μ_i the individual effect of firm, and $\varepsilon_{i,t}$ the error term.

Furthermore, in order to investigate the role of growth opportunities in the relation between financial leverage and investment, we include an interaction term between debt financing and growth. Growth is proxied by a dummy variable (D) which gives a value of 1 if Tobin's Q > 1, and 0 otherwise. Therefore, D = 1 indicates a high-growth firm and D = 0 indicates a low-growth firm. The same measurement of growth dummy is employed in Aivazian et al. (2005) The specification is as follows:

$$I_{i,t}/K_{i,t-1} = \alpha + \lambda_t + \beta_1 (CF_{i,t}/TA_{i,t-1}) + \beta_2 Q_{i,t-1} + \beta_3 LEVERAGE_{i,t-1} + \beta_4 (SALE_{i,t-1}/K_{i,t-1}) + \beta_5 SIZE_{i,t-1} + \beta_6 LEVERAGE_{i,t-1} \times D_{i,t-1} + \mu_i + \varepsilon_{i,t} \quad (2)$$

We run model (2) with two measures of financial leverage. We then employ three regression models, namely, pooled ordinary least square (pooled OLS), random effect model (REM) and fixed effect model (FEM), and run several tests to identify the most appropriate model for the sample data. In particular, F-test is performed to determine the choice between pooled OLS and fixed effect model, Lagrangian Multiplier (LM) test is run to help choose between pooled OLS and random effect model and Hausman test is conducted to identify whether random effect model or fixed effect model is more suitable for our empirical regression. In addition, Wald test is performed to check if heteroskedasticity exists in the models.

4. Discussion of Results

Table 2 reveals the correlation coefficients among the independent variables. Since all correlation coefficients are less than 0.7, multicollinearity is not a problem in our model.

The results of F-test and LM test confirm fixed effect model as the most suitable model for both regressions. Table 3 indicates that firms with higher growth prospect (higher Tobin's Q) generally invests more, but with larger level of long-term debt, those firms tend to be more cautious in their investment behavior (the coefficient of the interaction term between leverage and growth dummy is statistically significant at 10 per cent level). Our result confirms the debt-overhang problem, in which higher levered firms are more tempted to forgo investment projects that mainly benefit debtholders. In addition, our result is consistent with Brito and John (2002), who postulate the tendency of high-growth firms to follow safer investment policy while waiting for the growth opportunities to be implemented in the future.

Table 2 Correlation Coefficients Among Independent Variables

		(1)	(2)	(3)	(4)	(5)	(6)
(Total liabilities/Total assets) _{t-1}	(1)	1.000					
(Long-term debt/Total assets) _{t-1}	(2)	0.341***	1.000				
Cash flow _t /Net fixed assets _{t-1}	(3)	-0.173***	-0.09**	1.000			
(Net sales/Net fixed assets) _{t-1}	(4)	-0.015	-0.282***	-0.029	1.000		
Tobin's Q _{t-1}	(5)	-0.172***	-0.104**	0.484***	0.006	1.000	
Size _{t-1}	(6)	0.242***	0.317***	0.088**	-0.179***	0.315***	1.000

Note: Sample: strongly balanced panel. Number of companies: 122; number of observations: 523. ***, **, * statistically significant at the 1, 5 and 10 per cent level.

We are unable to report any impact of financial leverage on investment in low-growth firms, however. In both models with two measures of financial leverage, cash flows and sales have statistically significant and positive influence on investment. Manufacturing firms in our sample seem to rely on their internal funds to make investment decisions.

Table 3 presents the regression result of leverage, defined as Long-term debt over Total Assets, on investment in listed manufacturing firms in Vietnam in 2012-2018 period using alternative models (Pooled OLS, Random Effect Model and Fixed Effect Model). F-test, Lagrangian Multiplier and Hausman tests are performed to determine the suitable model. ***, **, * statistically significant at the 1, 5 and 10 per cent level.

Table 3 Regression Result

	Pooled OLS	REM	FEM
Intercept	-1.159 (-1.49)	-1.193 (-1.29)	-5.005 (-1.38)
Leverage _{t-1}	0.582* (1.78)	0.625* (1.68)	0.721 (1.01)
(Leverage*D) _{t-1}	-0.013 (-0.1)	-0.082 (-0.54)	-0.383* (-1.76)
Tobin's Q _{t-1}	-0.03 (-0.19)	0.05 (0.28)	0.446* (1.73)
Cash flow _t /Total Assets _{t-1}	1.151*** (2.73)	1.277*** (2.83)	1.892*** (2.94)
(Sale/Net fixed assets) _{t-1}	0.006*** (2.62)	0.007*** (2.94)	0.013*** (3.4)
Size _{t-1}	0.039 (1.37)	0.037 (1.1)	0.157 (1.21)
Observations	523	523	523
Groups		120	120
Adj. R ²	0.0231	0.0337	0.0257

Leverage = Long-term debt/Total Assets

Table 4 presents the regression result of leverage, defined as Total Liabilities over Total Assets, on investment in listed manufacturing firms in Vietnam in 2012-2018 period using alternative models (Pooled OLS, Random Effect Model and Fixed Effect Model). F-test, Lagrangian Multiplier and Hausman tests are performed to determine the suitable model. ***, **, * statistically significant at the 1, 5 and 10 per cent level.

Table 4 Regression Result

	Pooled OLS	REM	FEM
Intercept	-1.726** (-2.29)	-1.787** (-1.98)	-5.88 (-1.6)
Leverage _{t-1}	-0.057 (-0.33)	-0.03 (-0.15)	0.192 (0.44)
(Leverage*D) _{t-1}	-0.056 (-0.45)	-0.076 (-0.57)	-0.157 (-0.83)
Tobin's Q _{t-1}	-0.059 (-1.33)	-0.052 (-1.07)	0.036 (0.37)
Cash flow _t /Total Assets _{t-1}	1.083** (2.56)	1.169*** (2.58)	1.761*** (2.73)
(Sale/Net fixed assets) _{t-1}	0.005** (2.32)	0.006*** (2.69)	0.013*** (3.37)
Size _{t-1}	0.063** (2.28)	0.064* (1.93)	0.199 (1.48)
Observations	523	523	523
Groups		120	120
Adj. R ²	0.0178	0.0287	0.0215

Leverage = Total liabilities/Total Assets

5. Conclusion

The association between financial leverage and investment has long been discussed in the literature with various arguments. The agency problem among managers, shareholders and debtholders results in different influence of financial leverage on firms' investment behavior. Indebtedness is likely to reduce manager's overinvestment, induce shareholders' risk-shifting behavior or underinvestment strategy. Besides, the impact of financial leverage on investment may vary among firms with different growth opportunities.

This paper contributes to the literature by examining the listed manufacturing firms in Viet Nam in the period from 2012 to 2018. Firms in our sample have a low long-term debt ratio over total assets (average at 7 percent) and therefore mostly rely on short-term debts. We find a negative association between long-term leverage and investment in high-growth firms, indicating the underinvestment strategy and the risk-avoiding attitude in expectation of future projects. In addition, firms in our sample seem to fund their investment from internal cash flows to refrain from financial distress and bankruptcy costs. In firms without ample opportunities to growth, financial leverage has no impact on investment decisions. It is likely that corporate governance is weak in low-growth firms, and hence, the role of debt in reducing agency problem is attenuated.

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