Effect of Short-term Financial Constraints on SMEs, Investment Decisions

Hoda Eskandar

Assistant Professor, Department of Accounting, Faculty of Management and Accounting, Allameh Tabataba'i University, Tehran, Iran. (Email: heskandar@atu.ac.ir)

Hadi Hadadi*

*Corresponding Author, M.Sc., Faculty of Economics and Accounting, Islamic Azad University, Central Tehran Branch, Tehran, Iran. (Email: Hadi.hadadi1981@yahoo.com)

Abstract

Financial constraints are one of the influencing factors on investment decisions. Financial constraints put firms under pressure to forgo investment opportunities to finance their working capital needs. Moreover, some variables like working capital needs and liquidity of a firm are likely to affect the relationship between these two variables. Hence, this study seeks to examine the effect of short-term credit constraints on the investment of small and medium-sized enterprises (SMEs), firms with different characteristics in comparison with large-sized firms. In addition, this correlation is tested by considering the effect of mentioned moderating variables (working capital and liquidity). The sample of this study includes the firms listed in Tehran Stock Exchange from 2011 to 2018, which are considered as SMEs based on some criteria. Multivariate regression models and E-views software are used to test the research hypotheses. The results indicated that short-term credit constraints negatively affect corporate investment. It means that constrained firms invest in fewer investment opportunities because of facing source shortages.

Moreover, in companies requiring more working capital, the inverse effect of short-term credit constraints on corporate investment is stronger. Such firms suffer from financial problems and are not able to use their investment opportunities. Additionally, this hypothesis that companies with high liquidity can offset u effects of short-term financial constraints on fixed investment, is not confirmed.

Keywords: Financial Constraints, Investment, Small and Medium-Sized Enterprises (SMEs).

Introduction

Firms, financial condition influences their investment decisions. Firms fund their investment projects by selecting the most economical source of financing. They can use internal finance, debt capital, or issue new equity. According to the popular pecking order theory, the prioritization of funding sources by each firm is based on the cost it incurs. Although, under perfect capital markets assumption stated that firms can raise enough external capital to finance investment opportunities and cover any short-term cash flow shortages that may arise, in the real world, capital markets are not perfect. Therefore, the concept of "financial constraints" in financing the firms, projects becomes important (Kumar and Ranjani, 2018).

In imperfect markets, firms face financial constraints. In such markets, investment decisions are dependent on firm-level factors (Kumar and Ranjani, 2018). Given the particular financial characteristics of SMEs, short-term constraints are likely to significantly affect capital accumulation. Short-term credit constraints are as important as long-term ones in SMEs' investment decisions (Nicolas, 2019). Under imperfect capital market assumptions, corporates with the most serious agency problems (e.g., SMEs) mostly use internal financing sources and prefer debt to equity if they require external financing (Rui, 2019). Based on this view, corporates with financial constraints have higher investment sensitivity to cash flow (Mulier, Schoors & Merlevede, 2016; Mendoza, 2010; Nicolas, 2019). Moreover, liquidity and working capital needs may moderate this relationship. The working capital requirement can compete with a fixed investment when there is a financial constraint.

Additionally, highly liquid firms (i.e. with numerous current assets) are likely to be able to offset the impact of short-term financial constraints on fixed investment (Farooq & Ahmed, 2018). Therefore, this paper examines these relationships in Iran, a country with different characteristics from developed ones.

Literature Review

According to the standard definition of financial constraints, it is defined a firm as "yearly constrained" when it does not obtain the loans it has applied for during the year. More precisely, a firm is considered as cash (resp. investment) credit-constrained during the year t in three different cases: (a) the quarterly firm's application for liquidity (resp. investment) loan was denied at least once per year(loan application denied); (b) the firm received less than 75% of the quarterly loan amount it requested at least once per year (rationed); (c) the firm refused the quarterly loan offer because the rate was too high at least once per year (refused due to high cost). Alternatively, the firm is considered as not cash or investment credit-constrained whether its quarterly loan applications were totally approved or at least if the firm obtain more than 75% of the loans amounts it requested over the year (Ferrando and Mulier, 2015).

Financial constraint is one of the affecting factors on investment decisions. According to prior documents in the literature (Fazzari et al. 1988; Mulier et al. T. Nicolas 2016) financially constrained companies to show higher investment cash flow sensitivity. Financially constrained firms have a weaker balance sheet condition. Therefore, they incur higher external funding costs, in comparison with lower constrained ones. This is because constrained firms will be likely to have low liquidity and capital and higher default risk. Thus, the more constraint a firm has, the lower investment, as they will have greater problems in investing and finding external funding sources (Lerskullawat, 2018).

Following the hierarchy theory (Rui, 2019), short-term financial constraints prevent SMEs from benefiting from their investment opportunities by allocating further cash flow to working capital. In spite of the hypothesis of working capital-based investment smoothing, companies cannot easily earn a return from their cash assets. Surplus cash flow is, therefore, allocated to both working capital and fixed investment.

Since the advent of classical economics, the key role of working capital has been identified. In modern company finance, the net working capital

account includes liquid assets (financial and real). Working capital is defined as the sum of accounts receivable and inventories except for accounts payable and other non-financial liabilities with a maturity date of less than one year. In other words, working capital refers to the funds used to run the day to day business operations. It appears to be important for SMEs, particularly for sectors, including retail, construction, or manufacturing, where inventory management is a vital matter. Prior research showed that working capital and liquidity can affect the relationship between constraint and investment (Farooq & Ahmed, 2018). Nicolas (2019) documented that financial constraints significantly affect corporate investment. Moreover, he showed that working capital and liquidity may moderate this relationship. The increase in working capital needs is likely to compete with fixed investment whenever financial constraints are binding (Fazzari and Petersen 1993).

Pecking order theory (Myers and Majluf 1984; Vanacker and Manigart 2010; Serrasqueiro and Caetano 2015) stated that short-term financial constraints prevent SMEs to seize investment opportunities by putting them under pressure to allocate additional cash flow to finance their working capital. Although working capital can be used to buffer fixed capital investment from temporary changes in the availability of finance, Nicholas (2019) presume that firms cannot monetize their liquid assets so easily, thus both adjusting their working capital and fixed investment.

Working capital needs may increase the outstanding working capital that cannot be monetized in the presence of short-term financial constraints. This is especially the case for new accounts receivable that have, by definition, longer residual payment periods. In the context of short-term financial constraints, the additional funds allocated to new inventories or accounts receivable are not financed by short-term liabilities but rather long-term capital, which should be used for long-term investments. In contrast, this amplifying effect should not be relevant for long-term financial constraints. As a result, as cash credit constraints are likely to affect entrepreneurs' investment decisions through the working capital channel, the higher the increase in working capital needs, the lower their investment (Nicolas, 2019).

Facing difficulties to finance working capital needs implies serious liquidity risks for entrepreneurs. Yet, cash credit constraints may have heterogeneous effects on investment according to the existing level of liquid assets (Opler et al. 1999; Harford et al. 2008; Bates et al. 2009). The higher the cash holdings, the lower liquidity risks arising from the increase in working capital is likely to be. At last, active management of working capital help firms to alleviate financing constraints that affect fixed investment (Fazzari and

Petersen 1993; Carpenter et al. 1994; Ding et al. 2013). Indeed, SMEs' ability to smooth investment in fixed assets is likely to be higher for those exhibiting a higher beginning-of-year outstanding amount of gross working capital. In this perspective, past accounts receivable and inventories are considered as almost substitutes for cash.

Nicolas (2019) reported that financial constraints significantly affect corporate investment. Thus, financial constraints have affected long-term investment, for example, in a situation such as investing in tangible assets. Specifically, companies known with financial constraints have invested less in tangible assets. Additionally, he showed that the negative effect of financial constraints on investment is stronger in the firms with working capital needs. Moreover, this diverse relation is weaker in liquid firms, aiming to make them able to adjust accounts receivables and inventories.

Farooq & Ahmed (2017), using information about corporates in 37 developing countries, investigated the relationship between inflation and investment sensitivity to stock prices. They concluded that the investment sensitivity to stock prices in companies in high-inflation countries are lesser (Fazzari, Hubbard & Petersen, 1988). Espallier & Guariglia (2015), addressing the question of whether investment opportunities affect the investment sensitivity to cash flow or not, showed that investment opportunities do not easily reflect changes in investment sensitivity to cash flow; instead, it is more closely associated with financial constraint indicators (Myers & Majluf 1984).

According to the results of Ben Mohamed et al. (2014), investment sensitivity to cash flow is stronger in companies with financial constraints. Akbari et al. (2017) studied the relationship between investment opportunities and their sensitivity to cash flow. The results showed no significant relationship between investment opportunities and their sensitivity to cash flow.

Kumar and Ranjani (2018) investigate this relation among listed Indian manufacturing firms. They confirmed the pooling of internal funds by financially constrained firms to accept profitable investment opportunities in future.

InThailand, Lerskullawat (2018) documented that financial constraints affected investment. However, for firms' cash flow positively correlated with their investment, the leverage ratio was affected negatively.

Salehi et al. (2017) investigated managerial optimism and its effect on the investment sensitivity to cash flow, considering the presence or absence of

financial constraints. The results further indicated that the investment sensitivity to cash flow due to managerial optimism in companies with financial constraints is higher than those without (Salehi; Mousavi & Moradi, 2017).

The effects of agency costs on investment sensitivity to cash flows were studied by Arab Salehi & Nouri (2014). The results indicated that agency costs were not a factor in creating more (less) investment; however, it increased the investment sensitivity to cash flows (ArabSalehi & Kazemi Nouri, 2014).

Haghighat & Zargar Fuji (2013) addressed the impact of financial constraints and cash on investment sensitivity to cash flow. The results showed a positive relationship between capital expenditures and cash flow, and companies without financial constraints are more sensitive to cash flow than those.

Based on the results of Rungsomboon (2005) in Thailand, in financially constrained firms, the effect of cash flow on investment was higher.

Chatelain et al. (2003) investigated this relationship in Germany, France, Italy and Spain. They documented that an increase in cash flow influences investment directly.

According to mentioned literature, the research hypotheses are as the following:

1. "Short-term credit constraints negatively correlated with corporates investment."

2. "The negative correlation between short-term credit constraints and corporate investment is stronger for firms with higher increase in working capital needs."

3. "highly liquid firms are abler to offset the impact of short-term financial constraints on investment."

Research Methodology

In this research, the statistical population consisted of companies listed on the Tehran Stock Exchange (TSE) from 2011 to 2018. The sample includes the manufacturing firms listed in TSE in the mentioned time period of the research that their fiscal year should be ended at the end of the calendar year, with no change throughout the study period. 141 firms reach these criteria.

Then, the firms with all following conditions are considered as SMEs:

1. Having fewer than 250 employees.

2. Having sales less than the average total sales of all companies registered on the Tehran Stock Exchange.

3. Having the total assets less than the average total assets of all companies registered on the Tehran Stock Exchange.

Totally, 78 companies were chosen as the final sample.

According to Nicholas (2019), The following regression models are used to test the research hypotheses:

The first hypothesis is examined by model (1):

$$\frac{I_{i,t}}{A_{i,t-1}} = \beta_1 \frac{I_{i,t-1}}{A_{i,t-2}} + \beta_2 \frac{CF_{i,t}}{A_{i,t-1}} + \beta_3 \Delta S_{i,t} + \beta_4 ICC_{i,t} + \varepsilon_{i,t} \tag{1}$$

The second hypothesis is tested by model (2):

$$\frac{I_{i,t}}{A_{i,t-1}} = \beta_1 \frac{I_{i,t-1}}{A_{i,t-2}} + \beta_2 \frac{CF_{i,t}}{A_{i,t-1}} + \beta_3 \Delta S_{i,t} + \beta_4 ICC_{i,t} + \beta_5 \frac{\Delta W}{A_{i,t-1}} + \beta_6 ICC_{i,t} \times \frac{\Delta W}{A_{i,t-1}} + \varepsilon_{i,t} \tag{2}$$

The third hypothesis is investigated by model (3):

$$\frac{I_{i,t}}{A_{i,t-1}} = \beta_1 \frac{I_{i,t-1}}{A_{i,t-2}} + \beta_2 \frac{CF_{i,t}}{A_{i,t-1}} + \beta_3 \Delta S_{i,t} + \beta_4 ICC_{i,t} + \beta_5 Cash\ ratio_{i,t-1} + \beta_6 ICC_{i,t} \times Cash\ ratio_{i,t-1} + \varepsilon_{i,t} \tag{3}$$

Where:

$\frac{I_{i,t}}{A_{i,t-1}}$: Company investment: the ratio of capital expenditures on fixed assets to total assets at the period start.

$ICC_{i,t}$: Short-term credit constraints: It is calculated by using Altman Z-score adjusted by Kordestani et al. (2014), which is consistent with Iran financial and economic environment, like the following:

$$T - score\ A = 0.291\ x_1 + 2.458\ x_2 - 0.301\ x_3 - 0.079\ x_4 - 0.05\ x_5 \tag{4}$$

Where:

x_1: working capital divided by total assets.

x_2: the retained earnings (loss) divided by the total assets.

x_3: earnings before interest and taxes (EBIT) divided by total assets.

x_4: the ratio of the equity book value to total liabilities/debts.

x_5: the ratio of net sales to total assets.

The financial distress domain is defined between bankruptcy and financial health. Therefore, according to various stages of financial distress and bankruptcy (Newton & Altman), the limits of the modified Altman model are as follows:

Adj Z-Score ≤ -14.0: Bankruptcy stage with a very high probability (95%);

-14.0 >Adj Z-Score> 02.0: Complete financial distress stage;

02.0> Adj Z-Score> 36.0: Cash deficit stage and inability to pay financial or business debts;

36.0>Adj Z-Score> 6.0: The latent stage of financial distress; and

Adj Z-Score ≥ 6.0: Financial health stage.

Finally, according to the itemized limits, the virtual variable zero and one is used to distinguish the financial constraint stage.

$\frac{\Delta W}{A_{i,t-1}}$:The ratio of working capital changes (total accounts receivable and inventory except for accounts payable and other non-financial liabilities with a maturity date less than one year) to total assets at the period start.

$Cash\ ratio_{i,t-1}$: The ratio of cash holdings to total assets.

$\frac{CF_{i,t}}{A_{i,t-1}}$: The ratio of cash flow to total assets at the period start.

$\Delta S_{i,t}$: sales growth.

As mentioned before, the dependent variable is an investment, the independent variable is financial constraints, moderating variables are working capital and liquidity and according to Nicolas (2019), some control variables such as cash holding and sales growth affect the investment decision. Hence, the conceptual framework of the research is as the following:
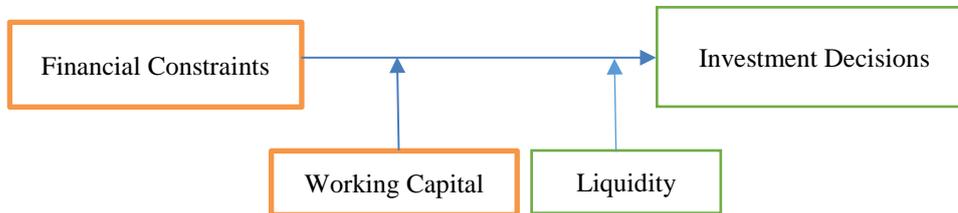
Research Findings

Descriptive statistics

Descriptive statistics of research variables are shown in table 1.

Table 1. Descriptive Statistics of the research variables

Description	$\dfrac{I_{i,t}}{A_{i,t-1}}$	$\dfrac{\Delta W}{A_{i,t-1}}$	$Cash\ ratio_{i,t-1}$	$\dfrac{CF_{i,t}}{A_{i,t-1}}$	$\Delta S_{i,t}$
Mean	0.057231	0.025968	0.076454	0.114904	0.251099
Median	0.022914	0.016286	0.051323	0.084273	0.151475
Maximum	0.774504	0.654433	0.460921	1.147600	3.579455
Minimun	0.000000	-2.372442	0.000469	-0.723518	-0.524412
Standard deviation	0.104368	0.244479	0.075460	0.201436	0.545867
Skewness	4.004255	-3. 896446	1.724022	0.931929	2.706589
Elongation	22.21519	41.84905	6.491129	8.480652	13.63715
Jarque -Bera	4189.145 0.000	15176.46 0.000	232.7442 0.000	323.9446 0.000	1377.031 0.000

According to the findings, the mean of the dependent variable (investment) is about 0.057. It means that the sample firms expend on fixed assets approximately 5.7 percent of their total assets at beginning of the fiscal year. The working capital of the firms is meanly 2.5%. in addition, they hold about 7.6 percentage of total assets as cash.

The Independent variable is short-term credit constraints. Short-term credit constraints are a virtual variable that equals one if the company has financial constraints, and otherwise zero. Table 2 presents the description of this variable. The table illustrates that about 25% of the sample are not under financial constraints and others suffer from financial problems.

Table 2. short-term credit constraints observations

Observation	Number	Percentage
Zero	158	25.32
One	466	74.68

The results of the reliability test of the variables are shown in table 3. The Levin-Lin-Chou unit root test is used to assess the reliability condition and the absence of false roots in the variables. According to the values of t-test statistics, which are higher than the critical value, and the probability of the statistics, which are less than 5% error level, the null hypothesis is rejected, and the research variables are at a stable level. The results show that the mean and variance of the variables over time and the covariance between different years are constant, and the presence of variables in the model does not cause false regression. Moreover, the Levin-Lin-Chu test results indicate all variables in the level to be meaningful. Thus, there is no need to perform the co-integration test.

Table 3. Results of the reliability test of research variables

Description	$\dfrac{I_{i,t}}{A_{i,t-1}}$	$\dfrac{\Delta W}{A_{i,t-1}}$	$Cash\ ratio_{i,t-1}$	$\dfrac{CF_{i,t}}{A_{i,t-1}}$	$\Delta S_{i,t}$
Test statistics	-28.5037	-2.54321	-8.56966	-8.90332	-11.8625
Statistics probability	0.0000	0.0055	0.0000	0.0000	0.0000

Hypotheses test

Given that the panel data model is a combination of data from different periods (selected companies) over time, the data combinability should be assessed by the F-Leamer test. In this test, H_0 is the model estimability in pool data, and the opposite hypothesis, H_1, is the model estimability in panel data. The F-Leamer test results can be observed in Table 4. Given that the F-statistic estimation probability is less than the 5% error level; all models are estimated in panel data. In other words, the specific effects of each company on the dependent variable are practical.

Table 4. Results of F-Limer test

Model	Test	Statistic	Number	Freedom degree	Probability	Results
1	Chu Poolability	F-Leamer	2.382918	(28.199)	0.0003	Panel data
2	Chu Poolability	F-Leamer	2.498409	(28.197)	0.0001	Panel data
3	Chu Poolability	F-Leamer	2.304963+	(28.197)	0.0005+	Panel data

The triple-model estimation results are provided in Table 5.

Table 5. Results of research model estimation

variables	Model 1	Model 2	Model 3
$\dfrac{I_{i,t-1}}{A_{i,t-2}}$	229.0 (799.32)***	292.0 (353.39)***	282.0 (227.63)***
$\dfrac{CF_{i,t}}{A_{i,t-1}}$	291.0 (670.54)***	299.0 (312.47)***	207.0 (493.14)***
$\Delta S_{i,t}$	-021.0 (-609.31)***	-035.0 (-488.35)***	-027.0 (-223.21)***
$ICC_{i,t}$	-034.0 (-310.9)***	-060.0 (-108.7)***	-015.0 (-577.3)***
$\dfrac{\Delta W}{A_{i,t-1}}$		095.0 (616.5)***	
$ICC_{i,t} \times \dfrac{\Delta W}{A_{i,t-1}}$		044.0 (367.6)***	
$Cash\ ratio_{i,t-1}$			375.0 (765.4)***
$ICC_{i,t} \times Cash\ ratio_{i,t-1}$			-0001.0 (-001.0)

Evidence from the research model test concerning the first hypothesis indicates a negative effect of short-term credit constraints on corporate investment; thus, the first research hypothesis is confirmed. Financial constraints negatively correlated with investment (-0.034). It means that the firms suffering financial constraints invest less money on capital expenditure on fixed assets. In addition, sales changes and the ratio of cash flow are respectively, negatively and positively correlated with investment. It indicates that more cash flow, more investment and more sales changes lead to less investment.

Evidence from the research model test concerning the second hypothesis shows that the inverse effect of short-term credit constraints on corporate investment in companies requiring more working capital is stronger; thus, the second hypothesis is confirmed. It means that working capital needs to moderate the relationship between financial constraints and investment. It makes this relation stronger. It means that in the firms with working capital needs, these variables have a more negative correlation. Such firms under constraints expend less money on fixed assets in comparison with the ones with fewer needs.

Evidence of the research model test for the last hypothesis indicates that companies with high liquidity not to be able to offset the effects of short-term financial constraints on fixed investment; therefore, the research fourth hypothesis is rejected.

Conclusion

There is a lot of factors affecting investment decision in SMEs, firms with different characteristics in comparison with other firms. One of them is financial constraints. Moreover, liquidity and working capital needs may moderate this relation in SMEs. This study examines these relations among the firms listed in TSE between 2010 to 2020.

Findings showed that financial constraints are negatively correlated with investment. The companies with severe information and agency complications have limited access to external financing; therefore, they easily reject or ignore profitable investment opportunities. Due to a lack of financial resources, companies with financial constraints are more cautious about investing. Furthermore, they have fewer investment opportunities. This finding is consistent with the results of Nicolas (2019), Kumar and Ranjani (2018) and InThailand, Lerskullawat (2018).

Given the negative impact of credit constraints on SMEs, investment, these companies are recommended to retain more cash to finance the investment so that they do not run out of internal resources over the financial crisis. These companies are also advised to raise the required funds for the investment by issuing shares. Given the positive effect of working capital on investment in the absence of financial constraints, these companies are recommended to use their working capital, prioritizing it over external capital. Finally, liquidity does not have any significant role in this relationship.

Declaration of Conflicting Interests

Funding

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