

THE INFLUENCE OF THE FINANCIAL DISTRESS IN COMPANIES ON THE RELATIONSHIP BETWEEN LONG-TERM INVESTMENT, CASH FLOWS AND INVESTMENT OPPORTUNITIES

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ABSTRACT

Each firm can use different types of capital structures for an active participation in the competitive market and attracting investors with respect to its economic situation, liquidity and flexibility. This study aimed at investigating the impact of the financial distress on the relationship between long-term investment, cash flows and investment opportunities of companies listed on the Tehran Stock Exchange. Population of the present study encompassed companies listed on the Tehran Stock Exchange over 2008 to 2015 that sample size was 115 firms with respect to the screening method and after the removal of unrelated observations. Financial distress, investment opportunities and cash flows are considered as independent variables in order to determine their impact on firms' investment efficiency (over- and under-investment). In terms of its purpose, this study is considered as an applied research, in terms of content and nature is descriptive-correlation and in terms of research design is post event.

In this study that used the mixed data, the results of firms' data regression analysis at a 95% confidence level indicated that the financial distress in companies had a direct effect on the relationship between long-term investment and cash flows. The results also showed that the firms' financial distress had a direct impact on the relationship between long-term investment and investment opportunities.

Keywords: Financial Distress, Long-Term Investment, Investment Opportunities, Cash Flows, Financing.

INTRODUCTION

Each company requires financial resources and, consequently, high liquidity and financial flexibility for an active participation in the competitive market and attracting investors with respect to the economic situation. Investment plays a pivotal role in corporate' development, and considering firms are limited by the resources available; they must pay particular attention to investment development and increasing of the investment efficiency (Saghafi and Fazel, 2011). Managers and investors need to be aware of the factors influencing investment in order to improve their investment. Managers and investors need to perceive and understand the factors affecting investment in order to improve their investment. Thus, the need for financing has increased by investors and creditors, which encourage suppliers to use their resources in a specific activity and the desired performance is an activity that leads to increase company value and thus shareholders' wealth. The use of any financial source depends on the decisions and strategies adopted by the management. In this regard, managers need both considering the company's return and achieving their own interests. (Tsui and Gul, 2007).

Investment less than needed amount that can exist in relationship between shareholders and creditors, assuming that managers act in the interests of shareholders, or the agency relationship between both old and new shareholders, when managers act in the interests of the old shareholders (Rekka et al., 2008).

Meyers (1977) argued for the first time that a high debt might encourage executives to reject positive net present value projects, and company value consists of the growth opportunities and current assets that it generates (the future capability for profitable investment). In fact, present value is a result of not only the expected cash flow, but also the probability that the firm actually takes advantage of them. The way in which current assets of company are to be financed using it and allow time for its capital base to build which has an impact on the ability to create and use the advantages of growth opportunities. The over-investment problem of managerial is based on the assumption that managers emphasize their role, ignoring the interests of shareholders, and their opportunistic behavior leads to a decrease in the total value of the company (Rekka et al., 2008).

Jensen (1986) examined overinvestment in order to understand how managers use the financial resources. Thus, in the absence of profitable investment projects and growth opportunities, managers prefer to use the free cash flows for their opportunistic purposes instead of paying a dividend to their shareholders. The development of the company and the increase of resources under managements' control may have more rights, credibility and power for managers (Stulz, 1990). This incentive can stimulate managers to invest all available resources (the free cash-flow) in projects that increase the firm's size but not its value. In fact, managers are also investing in negative net present value projects in order to increase firm's size and thus their own private benefits. (Degryse & DeJong, 2001).

The way can reduce the overinvestment problem by limiting managers in using firm's resources, and turning resources into debt that is an indirect means of controlling and regulating on managerial behavior by limiting their ability in using free cash flow inefficiencies, because at first the principal and interest on borrowed capital should be repaid (Rekka et al., 2008). Under a conservative debt policy, firms will have the ability to take a flexible financial structure. Financial ability enables the firms to have better access to financial resources when market positive shocks lead to investment opportunities, and provide their required funds to finance investment opportunities (Marchica & Mura, 2015).

According to the above mentioned matters, the main question of this research can be formulated: Does firms' financial distress affect the relationship between long-term investment, cash flows and investment opportunities of companies listed on the Tehran Stock Exchange?

MATERIALS AND METHODS

This study was a correlation research and considered as types of descriptive research. It is an applied research in terms of purpose. The studies and investigation the need for theoretical foundations of the research, the literature review, the background of the problem and the subject of the research have been carried out using a library method (study of books, articles, dissertations and research pertaining to subject). Required data were collected by computerized databases and reference to the library of the Stock Exchange Organization using Rahavard Novin Software and reference to www.rdis.ir website that belongs to Stock Exchange Organization (management of research, development and Islamic studies). In addition, firms' financial



statements including balance sheet, cash flow statement and the accompanying notes to the financial statements at the end of each fiscal year (March 20) were used as a research tool.

The population encompassed all companies listed on the Tehran Stock Exchange in the period from the beginning of 2008 to the end of 2015. The systematic elimination sampling method can be applied by the following conditions:

1. The information needed to measure the operational variables of the study is available to them.
2. They have been listed on the Stock Exchange at least since 2008 and will be active in the Stock Exchange until the end of the research period.
3. Their fiscal year ended on the 20th March.
4. They are not part of the formal banking system or investment financial institutions.

Table 1. Screening Table

Number	Description
484	All companies listed on the Stock Exchange until the end of 2015
72	The number of the listed companies that entered into the Stock Exchange during the research period
69	The number of companies that exited the Stock Exchange during the research period
55	The number of companies that were active in the financial industry, investment and banks
73	In order to be homogeneous, companies whose financial year did not end on the 20th March
64	Companies that had trading interruption more than three months during the research period
36	Companies that do not have the information available needed to measure variables
370	Total deleted companies
115	The number of companies that are considered



RESEARCH MODEL

In the present study, cash flow of long-term investments in firms is considered as a dependent variable, and the effect of independent variable such as financial distress on dependent variable can be examined using the following regression models.

Research hypotheses can be formulated as follows:

1. The financial distress in firms affects the relationship between long-run overinvestment and cash flows.
2. The financial distress in firms affects the relationship between long-run underinvestment and cash flows.
3. The financial distress in firms affects the relationship between long-run overinvestment and investment opportunities.
4. The financial distress in firms affects the relationship between long-run underinvestment and investment opportunities.

$$\text{Over Invest}_{i,t} = \beta_0 + \beta_1 CF_{i,t} + \beta_2 (CF_{i,t} \times \text{Distress}_{i,t}) + \beta_3 \text{Size}_{i,t} + \beta_4 \text{LEV}_{i,t} + \varepsilon_{i,t} \quad \text{MODEL 1}$$

$$\text{Under Invest}_{i,t} = \beta_0 + \beta_1 CF_{i,t} + \beta_2 (CF_{i,t} \times \text{Distress}_{i,t}) + \beta_3 \text{Size}_{i,t} + \beta_4 \text{LEV}_{i,t} + \varepsilon_{i,t} \quad \text{MODEL 2}$$

$$\text{Over Invest}_{i,t} = \beta_0 + \beta_1 \text{GrowthOPP}_{i,t} + \beta_2 (\text{GrowthOPP}_{i,t} \times \text{Distress}_{i,t}) + \beta_3 \text{Size}_{i,t}$$

$$+\beta_4LEV_{i,t} + \varepsilon_{i,t}$$

MODEL 3

$$Under\ Invest_{i,t} = \beta_0 + \beta_1 GrowthOPP_{i,t} + \beta_2(GrowthOPP_{i,t} \times Distress_{i,t}) + \beta_3 Size_{i,t}$$

$$+\beta_4LEV_{i,t} + \varepsilon_{i,t}$$

MODEL 4

Where *Over Invest_{i,t}* is equal to the positive values for the remainder of the Richardson model (2006) and *Under Invest_{i,t}* is equal to the magnitude of the negative values for the remainders of this model. . Other variables can be defined as follows.

Investment: The dependent variable can be used efficiency both under-investment and over-investment indicators to measure the investment. Also, Richardson's model (2006) can be used to measure underinvestment and overinvestment, as follows:

$$Inv_{i,t} = \alpha_0 + \alpha_1 Grow_{i,t-1} + \sum_j Control_{j,i,t-1} + \varepsilon_{i,t}$$

Where *Inv_{i,t}* is change in gross or net fixed assets, long-term investments, and intangible assets in the previous year's assets. *Grow_{i,t-1}* is income growth rate per year for company *i* in year *t-1*. *Control_{j,i,t-1}* as a controlled variable can be classified as follows:

Size_{i,t-1} is the natural logarithm of stock market value. *Lev_{i,t-1}* is debts divided by total assets for company *i* in year *t-1*. *Age_{i,t-1}* is age logarithm (since establishment of the firm) for company *i* in year *t-1*. *Cash_{i,t-1}* is cash ratio + short-term investment to average assets in year *t-1*. *Ret_{i,t-1}* is annual stock return that bought and maintained for company *i* in year *t-1*.

It should be noted that this model was estimated for the time period from 2004 to 2011, so that the coefficients of the model can be obtained and tested for the time period of the research, and finally, positive error values are called as the "overinvestment" and negative values are called as the "underinvestment".

CF is considered as an independent variable of the net ratio of cash flows resulted from operating activities to the net fixed assets of the first period.

Growth OPP is considered as an independent variable of investment opportunities equal to the equity market value ratio + book value of debt divided by the book value of company's total assets, then if this ratio for target company- year is greater than one, target company- year will have more investment opportunities, and otherwise the target year - company will have less investment opportunities (Lopez et al., 2015).

Distress is considered as a dependent variable and is the indicator of the companies' financial situation using the Altman's model adjusted by Kordestani et al. (2014) in the Tehran Stock Exchange. The reason for using the adjusted coefficients is that the main coefficients of the Altman's model are designed in the American economic environment and they may have high percent of errors in Iran.

The summary of the adjusted Altman model and its variables can be given by the following formula:

$$Adjusted-Z'-score = 0.291Y_1 + 2.458Y_2 - 0.301Y_3 - 0.079Y_4 - 0.05Y_5$$

Where *Y1* is the working capital to total assets ratio. *Y2* is the accrued profit (loss) to total assets ratio. *Y3* is the operating profit (loss) to total assets ratio. *Y4* is the book value of equity to total debt ratio. *Y5* is the sales to total assets ratio. In this model, the lower Altman adjusted model, indicated the greater the possibility of bankruptcy in a firm.

Lev is a controlled variable of the financial leverage for company *i* in year *t* obtained through the book value ratio of debt to the book value of company's assets. Size is a controlled variable of the size of the company *i* in year *t* obtained through the natural logarithm of the book value of company's assets.

RESEARCH FINDINGS

Reliability Test of Variables

In order to investigate the reliability, Im, Pesaran and Shin (1997), Levin and Lin (1992) tests were used. The results of this test are shown in Table 2.

Table 2. Im, Pesaran and Shin (IPS) Test

Variable Name		t-stat	p-value
Over Invest	Overinvestment	-27/990	0/000
Under Invest	Underinvestment	-22/766	0/000
CF	Net ratio of the operational cash flows	-20/908	0/000
GrowthOPP	Investment Opportunities	-27/365	0/000
Distress	financial distress	-29/606	0/000
Size	Firm's size	-10/515	0/000
Lev	Financial leverage	-10/491	0/000

The results of the test indicated that the mean or variance of the variables over time and covariance of variables over different years were constant. As a result, the use of these variables in the model did not result in a false regression.

Determining an Appropriate Model to estimate the Regression Model

In order to determine an appropriate model (mixed or panel data with fixed or random effects), Chow test has been used to test the hypotheses. The results of this test are shown in Table 3. The results indicated that the mixed data should be used to estimate the regression model of the study.

Table 3. Chow test results

Regression Model	F-statistics	Possibility	Result	
1	1/088	0/279	Accept the null hypothesis	Mixed data
2	1/096	0/263	Accept the null hypothesis	Mixed data
3	1/244	0/198	Accept the null hypothesis	Mixed data
4	1/386	0/167	Accept the null hypothesis	Mixed data

Hypothesis Testing in the Classical Regression Model

Before the fit of regression models, the first step is to test hypotheses of linear regression.

Testing for the Normality of Data Distribution

Jarque-Bera's test has been used to assess the normality of distribution for dependent variable. This testing is done for dependent variables. The results showed that these variables were normally distributed.

Table 4. Jarque-Bera test results to assess the normality of data distribution

Variable Name		Jarque-Bera (JB) Statistics	Significance level	Result
Over Invest	Overinvestment	1/4456	0/1961	Distribution is normal
Under Invest	Underinvestment	1/6457	0/1543	Distribution is normal



Testing Independence of Error

The Durbin–Watson statistics has been used to test the independence of errors. If the value of Durbin–Watson statistics ranged between 1.5 and 2.5, correlation between errors was rejected and regression can be used. The value of Durbin-Watson statistics for the first, second, third, and fourth models was 2/111, 2/332, 1/944, and 1/997, respectively. These values indicated that the errors were independent of each other and there was no autocorrelation between them and regression could be used.

Testing for normality of the error distribution

Jarque-Bera's test has been used to assess the normality of distribution of errors. This test was performed for errors from the first to fourth models. The results showed that fourth model was normally distributed.

Table 5. Jarque-Bera test results to assess the normality of error distribution

Description	Jarque-Bera (JB) Statistics	Significance level	Result
Model 1	1/107	0/267	Distribution is normal
Model 2	1/534	0/132	Distribution is normal
Model 3	1/443	0/177	Distribution is normal
Model 4	1/669	0/108	Distribution is normal

Testing for homogeneity of variances

Variance heterogeneity means that the values of error terms have the unequal variance to get an estimate of regression model. In this study, White's test has been used to investigate the heterogeneity of variances. The results indicated that the null hypothesis was not rejected based on the absence of heterogeneity of error variance among the model data at the error level of 0.05. For this reason, a regression model could be used.

Table 6. White test results

regression model	White's Statistics	P-value	Result
Model 1	1/443	1/257	absence of heterogeneity
Model 2	1/701	0/316	absence of heterogeneity
Model 3	1/649	0/298	absence of heterogeneity
Model 4	1/725	0/265	absence of heterogeneity

Testing for co linearity among independent variables

As shown in Table 7, the degree of tolerance and the variance factor for all other independent variables was greater than 0.2, and the variance inflation factor (VIF) was also very close to 1 (much less than 5), thus the hypothesis of the absence of co linearity among independent variables was confirmed.

Table 7. collinearity test among independent variables

Variable Name		Tolerance	Variance Inflation Factor (VIF)
CF	Net ratio of the operational cash flows	0/402	2/488
GrowthOPP	Investment Opportunities	0/303	1/784
Distress	financial distress	0/561	1/569
Size	Firm's size	0/637	1/713
Lev	Financial leverage	0/584	2/921

Assessing the fit of regression models

After testing the regression assumptions and ensuring their well-established tests, the results of fitting the regression equations can be presented in Tables 8 - 11.

Table 8. Results of fitting the first regression model

Variable Name		Coefficient of variation (CV)	Coefficient value	T -Statistics	Significance level
Constant number		β_0	0.212	3/009	0/001
CF	Net ratio of the operational cash flows	β_1	0/552	2/664	0/032
CF×Distress	Interaction effect between financial distress and cash flows	β_2	0/213	2/316	0/046
Size	Firm's size	β_3	0/109	2/388	0/045
Lev	Financial leverage	β_4	0/266	2/552	0/036
coefficient of determination		0/321		F -Statistics	12/223
The adjusted coefficient of determination		0/296		Significance (P-Value)	0/0000
				Durbin–Watson statistics	2/111

The significance level of the interaction effect between financial distress and cash flows (0.046) was less than 0.05. Therefore, the first hypothesis was not rejected based on this assumption that the financial distress in firms affected the relationship between the overinvestment and cash flows. In addition, the value of F-statistics (12.223) also indicated the significance of the first regression model.



Table 9. Results of fitting the second regression model

Variable Name		Coefficient of variation (CV)	Coefficient value	T -Statistics	Significance level
Constant number		B1	0/911	2/129	0/041
CF	Net ratio of the operational cash flows	β_1	0/213	2/273	0/047
CF×Distress	Interaction effect between financial distress and cash flows	β_2	0/107	2/921	0/015
Size	Firm's size	β_3	0/366	1/576	0/121
Lev	Financial leverage	β_4	0/244	2/311	0/034
coefficient of determination		0/321		F -Statistics	7/445
The adjusted coefficient of determination		0/296		Significance (P-Value)	0/009
				Durbin–Watson statistics	2/332

The significance level of the interaction effect between financial distress and cash flows (0.015) was less than 0.05. Therefore, the second hypothesis was not rejected based on this assumption that the financial distress in firms affected the relationship between the underinvestment and cash flows. In addition, the value of F-statistics (7.445) also indicated the significance of the second regression model.

Table 10. Results of fitting the third regression model

Variable Name		Coefficient of variation (CV)	Coefficient value	T -Statistics	Significance level
Constant number		β_1	0/671	2/273	0/047
GrowthOPP	Investment opportunities	β_1	0/219	2/173	0/048
Growth OPP×Distress	Interaction effect between financial distress and investment opportunities	β_2	0/418	3/167	0/079
Size	Firm's size	β_3	0/194	2/761	0/021
Lev	Financial leverage	β_4	0/173	2/037	0/049
coefficient of determination		0/377		F -Statistics	4/338
The adjusted coefficient of determination		0/329		Significance (P-Value)	0/021
				Durbin-Watson statistics	1/944

The significance level of the interaction effect between financial distress and investment opportunities (0.0007) was less than 0.05. Therefore, the third hypothesis was not rejected based on this assumption that the financial distress in firms affected the relationship between the overinvestment and investment opportunities. In addition, the value of F-statistics (4.338) also indicated the significance of the third regression model.

Table 11. Results of fitting the fourth regression model

Variable Name		Coefficient of variation (CV)	Coefficient value	T -Statistics	Significance level
Constant number		β_1	0/671	2/273	0/047
GrowthOPP	Investment opportunities	β_1	0/219	1/273	0/445
Growth OPP×Distress	Interaction effect between financial distress and investment opportunities	β_2	0/418	1/734	0/167
Size	Firm's size	β_3	0/194	2/761	0/021
Lev	Financial leverage	β_4	0/173	2/037	0/049
coefficient of determination		0/377		F -Statistics	4/338
The adjusted coefficient of determination		0/329		Significance(P-Value)	0/021
				Durbin-Watson statistics	1/944

The significance level of the interaction effect between financial distress and investment opportunities (0.616) was greater than 0.05. Therefore, the fourth hypothesis was rejected based on this assumption that the financial distress in firms affected relationship between long-term underinvestment and investment opportunities. In addition, the value of F-statistics (4.338) also indicated the significance of the fourth regression model.

CONCLUSION

Today, the need for financing has increased by investors and creditors. On the other hand, suppliers have used their resources in an activity that has a desirable performance, and leads to increase company value and thus shareholders' wealth. The use of any financial source depends

on the decisions and strategies adopted by the management. Present value is a result of not only the expected cash flow, but also the probability that the firm actually takes advantage of them. The way in which current assets of company are to be financed using it and allow time for its capital base to build which has an impact on the ability to create and use the advantages of growth opportunities. In this study, the influence of financial distress in firms on the relationship between long-term investment, cash flows and investment opportunities was tested using multivariable regression analysis based on four models.

According to analyses performed in the study, the first hypothesis was not rejected based on this assumption that the financial distress in firms affected the relationship between the overinvestment and cash flows. Based on the value of coefficient of variation of the interaction effect between the financial distress and cash flows (0.213), it could be concluded that the financial distress in firms had a direct impact on the relationship between the overinvestment and cash flows. In addition, the second hypothesis was not rejected based on this assumption that the financial distress in firms affected the relationship between the underinvestment and cash flows. Given the value of coefficient of variation of the interaction effect between financial distress and cash flows (0.17), it could be deduced that financial distress in firms had a direct impact on the relationship between the underinvestment and cash flows. As the studies shown, the third hypothesis was not rejected based on this assumption that financial distress in companies affected the relationship between long-term overinvestment and investment opportunities. Based on the value of coefficient of variation of the interaction effect between financial distress and investment opportunities (0.418), it could be concluded that financial distress in companies had a direct impact on the relationship between the overinvestment and investment opportunities. Finally, the analysis showed that the fourth hypothesis was rejected based on this assumption that the financial distress in companies affected the relationship between the long-term underinvestment and investment opportunities.

Thus the results of this study are consistent with Arslan et al. (2006), Clarke (2014), Marchica & Mura (2015), Kashanipour & Naghinejad (2009), Bashiri (2014) and Khodaei Valahzaghari (2015) findings.

According to the results, since financial distress in companies has a direct impact on the relationship between long-term investment and cash flows, it is suggested to investors and financial analysts when making investment decisions about choosing the optimal portfolio of stocks and deciding on the factors affecting the investment decisions in firms, they pay special attention to the financial distress factor and their significant positive direct effect on the long-term investment decisions in companies.

Moreover, in order to carry out future research associated with this research, we suggest that it be used other financial distress assessment models such as William Beaver, Springate, Ohlson, Toffler, etc. And their results compare with the results of this study.

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