



## Financial Constraints, Dividend Policy and Financial Crisis of Firms

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### ABSTRACT

Since the main objective of firms is to gain earnings and maximize the shareholders' wealth, one of the factors affecting it is firm's dividend policy. Dividend policy issue has been always one of the most important proposed financial issues. The aim of implementing such a policy is determining the role of this policy in maximizing the shareholders' wealth. Therefore, the firms' being in financial constraints may affect the firms' dividend policy. The purpose of this study is to evaluate the relation of financial constraints with dividend policy and financial crisis in firms listed on the Tehran Stock Exchange. To achieve this goal, a sample, consisting of 115 firms listed in Tehran Stock Exchange during the five-year period from 2008 to 2012 has been investigated. To verify the research hypotheses, multiple regression test has been used. The results of the hypotheses testing show that by the change in the amount of financial restrictions based on KZ index, earnings per share, dividend per share and the risk of financial crisis will change.

**Keywords:** Financial Constraints, Earnings per Share, Dividend per Share, Financial Crisis

### INTRODUCTION

Are the financially constrained firms able to invest? The term of financial constraints refers to the situation that hinders all desirable investments. Inability to fund for investment, may be due to poor credit conditions and lack of ability in making loans and/ or lack of ability in issuing new shares or the presence of non-cash assets. However, financial constraints cannot be synonymous with financial pressure. It is also not synonymous with economic hardship or bankruptcy risk, although these are undoubtedly related to financial constraints.

The variances of stock prices of firms that are facing financial constraints, could logically be reflected in stock returns. If financial constraints are as a characteristic of a firm value, then the changes in their intensity should be reflected in the stock returns. However, if financial constrained firms are subjected to shock, then there will be variance in stock returns of the firm with similar levels of financial constraints. For example, if credit conditions are so that some firms have difficulty in securing funds for investment, then the expected future cash flows of these firms, and as a result their stock prices will decrease together.

### LITERATURE REVIEW

Business units are always faced with many investment opportunities and require a rational decision making about an optimized investment. In fact, investment in each business unit should be done given its resources limitations and efficiency. However, the main problem is selecting the projects and making decision on investment opportunities by the managers of the business

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units. One of the basic assumptions in financial management literature is that every firm is established with the goal of maximizing shareholders' wealth.

In order to reach this goal, management of the firm should try to always invest in projects with positive net present value, so that the trend of increasing shareholders wealth is preserved. Firms fund the financial resources needed to invest in projects from internal resources, borrowing or increasing the capital. However, all firms are not able to provide all the funds needed to invest in their own projects and face limitations in providing needed resources that these limits are known as financial constraints. Financial constraints are those constraints that hinder the achievement and supply of all needed resources for desired investments of the firm.

Those firms are considered as financial constrained firms, which has low and costly access to external financing sources. In these firms, the main reason for the difference between the costs of internal and external financing is the lack of information asymmetry and agency problems. Information asymmetry refers to a state that capital market participants do not have equal access to information. For example, intra-organizational individuals have information that is not available to foreign investors. Information asymmetry creates risk and information hazard for sponsors. Therefore, they demand a higher return for the increased risk or in case of issuing new share, demand it with lower prices. This will lead the firm towards reducing investment and increasing financial pressure. According to the contents stated above and also the importance of financial constraints, studying the effects of these variables on dividend policy of firms is important.

Jahankhani and Ghorbani (2006) in a study, identified and explained the determinants of dividend policy in listed firms in the Tehran Stock Exchange. The results indicate that the dividend policy of the firms follows random walk pattern. In addition, with regard to verification of messaging theory, it is expected if a firm enjoys high (low) profit growth, its cash returns will be high (low). Furthermore, the firm's size, investment opportunities, financial structure, risk and financial leverage are other things that play role in the description of dividend policy in stock firms.

Bagheri Nasab et al (2012) on their study, entitled "Identification and explanation of factors affecting dividend policy in corporations", found that the natural tendency to pay dividends is high among profitable corporates and those firms that their retained earnings form a large portion of equity.

Dong Mi Li (2010) in an investigation, studied two forms of asset pricing through the interaction between financial constraints and investment in research and development. The results show that the firms that have constrains financially and do research and development, likely either stop or suspend their research and development projects. Therefore the risk of research and development firms will increase in the situation of financial constraints presence. Theoretically and observationally it is indicated that there is high correlation between financial constraints and stock returns among research and development firms.

Masters et al (2013), on a study, entitled "Financial constraints and dividend policy", investigated the dividend policy in two groups of firms with financial constraints and the firms that have no financial constraints. The results indicate that financial constrained firms, compared to firms without financial constraints, after the dividend, experience lower stock performance increase, and operating performance. The results also show that, in firms with financial constraints that increase dividend, in comparison with firms without financial constraints, after the stock dividend, the risk of financial crisis will increase more.

### **RESEARCH HYPOTHESES:**

First Hypothesis: There is a significant relationship between the financial constraints based on KZ index and earnings per share of the firm.

Second Hypothesis: There is a significant relationship between the financial constraints based on KZ index and dividend per share of the firm.

Third Hypothesis: There is a significant relationship between the financial constraints based on KZ index and financial crisis risk of the firm.

## METHODOLOGY:

The methodology of present study is correlational in terms of nature and content. The research was conducted within the framework of deductive - inductive reasoning. In the present study we first, examine the correlation between research variables and if there is a correlation between the variables, we then estimate multiple regression models. On the other hand, the study is an ex post facto study (quasi-experimental), which is conducted based on analysis of past and historical information (financial statements). In addition, the research is a library study and analytical - causal and based on panel data analysis. It is an applied research in terms of objectives and descriptive-correlational in terms of methodology.

## Statistical Population and Sample

The statistical population consists of all firms listed on the Stock Exchange in Tehran for the fiscal years 2008 to 2012. The systematic elimination method is used to select the research sample. Of total listed firms on Tehran Stock Exchange those firms that have the following characteristics are selected:

1. Firms that have activity continuity during the financial year.
2. The end of their fiscal year is March
3. Firms are not among investment firms and financial intermediaries.
4. Research required information of the firms is available.

Due to imposing these conditions, 575 firm-years in time period from 2008 to 2012 are selected as the research sample.

## Research Model and Variables:

First Hypothesis Model:

$$EPS = \beta_0 + \beta_1 \text{Financial Constraints}(KZ)_{i,t} + \beta_4 LEV_{i,t} + \beta_5 SIZE_{i,t} + \beta_6 ROA_{i,t} + \varepsilon_{i,t}$$

Second Hypothesis Model:

$$DPS = \beta_0 + \beta_1 \text{Financial Constraints}(KZ)_{i,t} + \beta_4 LEV_{i,t} + \beta_5 SIZE_{i,t} + \beta_6 ROA_{i,t} + \varepsilon_{i,t}$$

Third Hypothesis Model:

$$Distress = \beta_0 + \beta_1 \text{Financial Constraints}(KZ)_{i,t} + \beta_4 LEV_{i,t} + \beta_5 SIZE_{i,t} + \beta_6 ROA_{i,t} + \varepsilon_{i,t}$$

Research independent variable is financial constrain and KZ index is used as follows to measure financial constraints of the firms:

## KZ Index:

The index which was introduced by Kaplan and Zingales (1997) is defined as follows:

$$KZ = -1.002 \frac{CF_{it}}{A_{it-1}} - 39.368 \frac{Div_{it}}{A_{it-1}} - 1.315 \frac{C_{it}}{A_{it-1}} + 3.139 Lev_{it} + 0.283 Q_{it}$$

## Financial Constraints, Dividend Policy and Financial Crisis of Firms

$CF_{it}$ : Cash flow in year t.

$A_{it-1}$ : Value of total assets at beginning of period t.

$Div_{it}$ : Divided in year t.

$C_{it}$ : The amount of cash.

$Lev_{it}$ : The ratio of book value of liabilities to total book value of assets.

The higher the obtained amount of the above index, the more intensive the financial constraints will be. To achieve a uniform scale, the obtained values for the sample firms are changed into zero to one scale, based on diminishing values.

In this study, the dependent variables are dividend policy and the risk of financial crisis:

**Dividend Fiscal Policy:** It is measured by two variables of earnings per share and dividend per share.

1. Earnings per share (EPS): Dividend is calculated after the deduction of firm tax by the total number of shares, which represents the earnings that the firm achieves within a specified period per ordinary share.

2. Dividend per share (DPS): It is a part of earnings after tax deduction per share that is paid by the firm. Dividends paid per share is obtained through total dividend (approved by the Annual General Meeting) divided by the number of shares of the firm. As DPS is a part of the EPS, about the division of which shareholders give opinion, it is usually less than EPS. Of course, if all the earnings are divided, EPS and DPS become equal. In certain cases, DPS is higher than EPS that this additional amount is usually supplied from accumulated earnings of the previous years. This situation mostly represents the firm's lack of plan.

### Risk of Financial Crisis:

It refers to the financial situation of the firm in terms of exposure to risk of bankruptcy which is defined operationally using Altman's Z' Model as follows:

Edward Altman presented Z model in 1968. Then in later years, modifying the deficiencies of Z model, he presented Z' Model. Model Z 'Z model is modified. These two models are specified for manufacturing companies and are applied for predicting bankruptcy of all manufacturing enterprises, both public and private. Using multiple discriminant analysis and among 22 financial ratios that seemed to be the best predictor for predicting bankruptcy, Altman chose five ratios in the form of a combination as the best predictor of bankruptcy. The five combinational ratios are as follows:

The ratio of working capital to total assets (x1)

The ratio of accumulated earnings to total assets (x2)

The ratio of earnings before interest and taxes to total assets (x3)

The ratio of equity book value to liabilities book value (x4)

The ratio of sales to total assets (x5)

Model used by Altman is presented as follows:

$$Z' = 0.717X1 + 0.84X2 + 3.1X3 + 0.42X4 + 0.998X5$$

If  $Z' < 1.2$  complete bankruptcy, if  $Z' < 2.9 > 1.2$  between bankruptcy and non-bankruptcy and if  $Z' > 2.9$  entity remains in good health.

### Control Variables:

$Lev_{it}$ : The ratio of debt to total assets of the firm.

$Size_{it}$ : The size of firm that is defined using the natural logarithm of the market value of equity.

$ROA_{it}$ : The ratio of earnings after tax deduction to total assets (Madrakian, 2011).

**RESULTS**

The study on the mean of dependent variables show that the means of earnings per share, dividend per share and the risk of financial crisis, respectively, are 982.06, 987.934 and 1.89, and the mean of the independent variable of KZ index is obtained equal to 2.113.

Survey of skewness coefficient results of research variables show that the KZ variable has negative skewness coefficient, which indicates that the distribution of the data in these variables, compared to the normal curve, skew to the left. For variables with positive skewness coefficient, the skew is to the right. In addition, the kurtosis coefficient of research variables demonstrates that all variables have positive kurtosis that is higher than normal curve.

Table (1) Descriptive Statistics of Research Variables

	KZ Index	Earnings per Share	Dividend per Share	Financial Crisis Risk
Mean	-2.113076	982.0642	987.9345	1.890851
Max.	6.757800	112090.7	95464.28	4.476100
Min.	-22.71810	-6437	0	-0.680200
S. D.	4.691614	5145.075	5447.47	0.825799
Skewness	-1.411417	20.34954	15.44134	0.095381
Kurtosis	5.431942	439.9277	247.1044	3.156189

**Research Hypotheses Review:**

**First Hypothesis Test:**

There is a significant relationship between the financial constraints based on KZ index and earnings per share of the firm.

H0: There is no significant relationship between the financial constraints based on KZ index and earnings per share of the firm.

H1: There is a significant relationship between the financial constraints based on KZ index and earnings per share of the firm.

Study on the significance of fitted regression model of the first hypothesis shows that the significance level of the statistic F (172.136) is smaller than 5% and significant (sig< 0.05). Therefore, the assumption H0 can be rejected with confidence level higher than 95% and the research H1 hypothesis is accepted. This means that financial constraints based on the KZ index has a significant effect on the firms' earnings per share. In addition, the determination coefficient of regression model shows that the KZ index variable explains 25.8% of total changes in earnings per share of the firms.

Furthermore, the study on the regression coefficient of KZ index (-0.121) shows a significant negative impact on the earnings per share at 5% significance level. The results indicate that, the more the financial constraints based on KZ index increase in the firms, the more the earnings per share is reduced. Therefore, for one unit increase or change in the KZ index, earnings per share will reduce or change -0.121 unit.

## Financial Constraints, Dividend Policy and Financial Crisis of Firms

Table (2) Results of Research First Hypothesis (Dependent Variable: Firm's Earnings per Share)

Variable	Regression Coefficient	Standard Error	T Statistics	Significance Level
Intercept	6.036300	0.049605	121.6875	0.0000
KZ Index	-0.120780	0.009206	-13.12005	0.0000
Determination Coefficient	25.8	F Statistics		(0.000)72.136
Adjusted Determination Coefficient	25.6	Durbin-Watson		2.05

### Research First Hypothesis Along with Control Variables:

Survey on results of the first hypothesis with control variables indicate that using the fitted model, 25.92% of earnings per share of the firms are explained. Investigation on the significance of the regression model show that at 5% error level, the significance level of F-statistic of fitted model is less than 5 percent and significant.

Table (3) First Hypothesis Test Results Along with Control Variables

Variable	Regression Coefficient	Standard Error	T Statistics	Significance Level
Intercept	5.948678	0.342267	17.38022	0.0000
KZ Index	-0.119538	0.010675	-11.19747	0.0000
Financial Leverage	-0.002676	0.243010	-0.011013	0.9912
Firm Size	0.007521	0.023507	0.319964	0.7491
Return on Assets	0.011901	0.013850	0.859306	0.3906
Determination Coefficient	25.92	F Statistics		(0.000)14.055
Adjusted Determination Coefficient	25.32	Durbin-Watson		2.037

In addition, as can be seen in the table of coefficients, among the studied variables, regression coefficient of KZ index variable (-0.119) has a significant negative impact on the Firm's earnings per share at 5 percent error level. Furthermore, the study on the regression coefficients of control variables of financial leverage, firm size and return on assets shows that as their coefficients are greater than 5%, at error level of 5% there is no significant effect on earnings per share of the firms.

### Second Hypothesis Test:

There is a significant relationship between the financial constraints based on KZ index and dividend per share of the firm.

H0: There is no significant relationship between the financial constraints based on KZ index and dividend per share of the firm.

H1: There is a significant relationship between the financial constraints based on KZ index and dividend per share of the firm.

Table (4) Results of Research Second Hypothesis (Dependent Variable: Dividend per Share)

Variable	Regression Coefficient	Standard Error	T Statistics	Significance Level
Intercept	5.564819	0.042858	129.8433	0.0000
KZ Index	-0.182704	0.007951	-22.97818	0.0000
Determination Coefficient	52.12	F Statistics		(0.000)527.996
Adjusted Determination Coefficient	52.02	Durbin-Watson		1.86

As it can be observed, the study on the significance of fitted regression model of the second hypothesis shows that the significance level of the statistic F (527.996) is smaller than 5% and significant ( $\text{sig} < 0.05$ ). Therefore, the assumption H0 can be rejected with confidence level higher than 95% and the research H1 hypothesis is accepted. This means that financial

constraints based on the KZ index has a significant effect on the firms' dividend per share. In addition, the determination coefficient of fitted regression model shows that the KZ index variable explains 52.12% of total changes in dividend per share of the firms.

Furthermore, the study on the regression coefficient of KZ index (-0.183) shows a significant negative impact on the dividend per share at 5% significance level. This means that the more the financial constraints based on KZ index increase in the firms, the more the dividend per share is reduced. Therefore, for one unit increase or change in the KZ index, dividend per share will reduce or change -0.183 unit.

**Research Second Hypothesis Along with Control Variables:**

Survey on results of the second hypothesis with control variables indicate that using the fitted model, 54.75% of dividend per share of the firms is explained. Investigation on the significance of the fitted regression model show that at 5% error level, F-statistic value is less than 5 percent (0.000) and significant.

In addition, as can be seen, the regression coefficients of main and control variables of the model is presented in Table 5. The study on regression coefficients of fitted model variables shows that the regression coefficients of KZ index (-0.204) and financial leverage (1.0005), have, respectively, a significant negative and positive impact on the firm's dividend per share at 5 percent error level. This means that the dividend per share will decrease under the effect of KZ index and will increase under the effect of financial leverage of the firms. However, regard to the coefficients obtained, it can be stated that for one unit increase or change in the KZ index and financial leverage, dividend per share will reduce 0.204 unit and will increase 1.0005 unit, respectively.

Table (5) Second Hypothesis Test Results Along with Control Variables

Variable	Regression Coefficient	Standard Error	T Statistics	Significance Level
Intercept	5.008655	0.285447	17.54670	0.0000
KZ Index	-0.204058	0.009131	-22.34694	0.0000
Financial Leverage	1.000596	0.203511	4.916671	0.0000
Firm Size	-0.010661	0.019578	-0.544565	0.5863
Return on Assets	0.041960	0.027092	1.548811	0.1221
Determination Coefficient	554.75	F Statistics		(0.000)145.82
Adjusted Determination Coefficient	54.37	Durbin-Watson		1.92

**Third Hypothesis Test:**

There is a significant relationship between the financial constraints based on KZ index and financial crisis risk of the firm.

H0: There is a significant relationship between the financial constraints based on KZ index and financial crisis risk of the firm.

H1: There is a significant relationship between the financial constraints based on KZ index and financial crisis risk of the firm.

Study on the significance of fitted regression model of the third hypothesis, using estimated random-effects method, shows that the significance level of the statistic F value (314.628) is smaller than 5%. Thus, the regression model is significant at 5 percent error level (sig< 0.05). Therefore, the assumption H0 can be rejected with confidence level higher than 95% and the research H1 hypothesis is accepted. This means that KZ index has a significant effect on the risk of financial crisis of the firms. In addition, the determination coefficient of regression model shows that the KZ index variable explains 36.43% of total changes in the risk of financial crisis of firms.

## Financial Constraints, Dividend Policy and Financial Crisis of Firms

Table (6) Results of Research Third Hypothesis (Dependent Variable: Risk of Financial Crisis)

Variable	Regression Coefficient	Standard Error	T Statistics	Significance Level
Intercept	1.676598	0.035972	46.60831	0.0000
KZ Index	-0.110308	0.006209	-17.76574	0.0000
Determination Coefficient	36.43	F Statistics		(0.000)314.628
Adjusted Determination Coefficient	36.32	Durbin-Watson		1.945

Furthermore, the study on the regression coefficient of KZ index (-0.1103) shows a significant negative impact on the risk of financial crisis of firms at 5% error level. The results indicate that, the more the KZ index increases in the firms, the more the risk of financial crisis is reduced. Therefore, regard to the regression coefficient of independent variable, it can be stated that for one unit increase in the KZ index, the risk of financial crisis of the firms will reduce - 0.1103 unit.

### Research Third Hypothesis Along with Control Variables:

Table (7) Third Hypothesis Test Results Along with Control Variables

Variable	Regression Coefficient	Standard Error	T Statistics	Significance Level
Intercept	0.638283	0.615915	1.036317	0.3006
KZ Index	-0.100532	0.008355	-12.03328	0.0000
Financial Leverage	-0.548078	0.182133	-3.009222	0.0028
Firm Size	0.115624	0.049646	2.328956	0.0203
Return on Assets	-0.010056	0.010242	-0.981808	0.3267
Determination Coefficient	55.52	F Statistics		(0.000)4.57
Adjusted Determination Coefficient	43.37	Durbin-Watson		2.44

Survey on results of the third hypothesis with control variables, using estimated random-effects method indicates that 55.52% of the risk of financial crisis of firms is explained by the KZ index along with control variables. Investigation on the significance of the fitted regression model show that at 5% error level, the F-statistic value (4.57) is less than 5 percent (0.000) and significant.

As can be seen, significance level of regression coefficients of KZ index (-0.1005), financial leverage (0.548) and firm size (0.116) are less than 5%. These results show that KZ index at the error level of 5 percent has negative and significant impact, and firm size and financial leverage have significant and positive effect on the risk of financial crisis of firms. Furthermore, regard to the coefficients obtained, it can be stated that for one unit increase or change in the KZ index, financial leverage and firm size, will reduce 0.1005 unit and will increase 0.548 unit and 0.116 unit, respectively.

## CONCLUSION

In this study, the relation of financial constraints with dividend policy and the financial crisis in listed firms on Tehran Stock Exchange is examined. All hypotheses are confirmed. This means that there is a significant relationship between the presence or absence of financial constraints, based on KZ index, and earnings per share, dividend per share and the risk of financial crisis of the firms.

The results of testing research hypotheses are consistent with the results of the study carried out by Masters et al (2013) based upon firms with financial constraints compared to firms without financial constraints after the stock dividend, experience lower stock performance

increase, and operating performance. increased performance and reduced operating performance and experience. The results also show that, in firms with financial constraints that increase dividend, in comparison with firms without financial constraints, after the stock dividend, the risk of financial crisis will increase more. research results are also consistent with the results of the study carried out by Lamont, Pack and Sariko Pajo (2001) that firms with financial constraints can affect the return on equity and research results of Black (1976) and Christie (1982), based on, it leads the firm to have more risk and more volatility and the financial constraints.

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