

# The pattern of capital increase and its role on abnormal stock returns in Tehran Stock Exchange member companies using the structural equation model

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## Abstract

Financing patterns should minimize the weighted average of capital and maximize shareholder value. This study aimed to evaluate the factors affecting the financing model through a capital increase and its effect on abnormal stock returns. This mixed study was conducted based on interviews with 16 experts. Factors such as investment purposes of the capital increase, sources of the capital increase, and differences in the rules of the Tehran Stock Exchange, such as the scope of oscillation and characteristics of the company, are the essential components affecting the pattern of capital increase. In addition, the results of the qualitative analysis were measured by using the questionnaire tool and asking the opinions of 400 financial managers and university professors using the structural equation analysis method. The results showed that the investment objectives of the capital increase, the methods of increasing cash from shareholders and stock premium, and stock dilution significantly affected capital increase and, consequently, abnormal and negative stock returns.

Keywords: capital increase, purposes of capital increase, sources of growth, abnormal stock returns  
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## 1 Introduction

A share is a unit of ownership in a company, which is considered the monetary unit of the company's owners and is reported in the classification of the balance sheet other than the registered capital of the companies. An amount for the shares held by the shareholder is given to the shareholders as dividends. Every company registers a certain amount of its capital as initial capital at the beginning of its establishment. Over time, companies may think of developing their activities or maintaining and developing their competitive power in the market. In such cases, companies issue new shares or increase the shares to provide the necessary resources to finance their projects. This process of financing companies is called capital increase [3]. Capital has been proposed as the essential parameter affecting companies' valuation and direction in the capital markets. The current changing environment has made the rating of companies in terms of credit to some extent dependent on their capital and its increase, which has brought

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their strategic planning closer to selecting effective resources with the goal of "maximizing shareholder wealth" [16]. Therefore, the factors affecting the capital and its change can affect the profitability and the increase in the stock price in the coverage of the mentioned goal in the form of representation theory and compliance with the theory of hierarchy. The wave of decision-making by financial managers in the field of compliance with the principle of matching when providing financial resources to increase capital is a specific approach in adjusting decisions according to the requirements of the economic environment of companies as a suitable model for the prosperity and increasing the effectiveness of the thinking governing the financial performance of companies [9]. Understanding the effect of capital raising on shareholder ownership is essential, especially in the early stages, because dilution can change the company's financial stake. When a company offers new shares to investors or stock option holders exercise their right to buy shares, stock depreciation occurs [15]. On the other hand, it is a good sign for investors and analysts if a company can issue a significant amount of additional shares without significantly reducing the share price. Companies needing capital often turn to new capital-raising offerings to meet their financing needs. A wide range of studies worldwide shows that announcements of new capital-raising proposals are associated with negative abnormal stock returns. Research literature has emphasized the effects of capital increase intentions on the usefulness or negative impacts of this company's action on the value of shareholders' equity. It is necessary to study the issue to clarify the effect of capital increase on the market value of equity in terms of its purposes in the proposed model. The issue of providing a capital increase model has not been worked on in Iran, and on the other hand, considering that companies are involved in the capital increase, which can have a significant effect on investors' decisions. The pattern of capital increase for the Tehran Stock Exchange is essential to examine the impact of announcing the capital increase, financing purposes, and legal processes for proposing the issuance of new shares. This research investigated the effect of various components on the capital increase of companies in the Tehran Stock Exchange. Further, the effect of explaining the pattern of capital increase for Iranian companies about the differences between the Tehran Stock Exchange compared the characteristics of foreign stock exchanges and the impact of these differences on the outcome of the company's capital increase was discussed. For this purpose, the theoretical foundations of the research were stated in the second part, and then in the third part, the research method and the proposed model were described. In the fourth part, the results of the model were analyzed.

## 2 Theoretical foundations

Financing is the art and science of cash management. The purpose of financing is investment, profitability, risk reduction, and meeting the economic and social needs of the company. The profit from the company's business is considered one of the critical factors for the continuation of the financial company's activity, which is an essential source for financing the company's operational activities in the future. The main goal of any kind of economic activity is to make a profit, and it is impossible without financial resources [1]. The main objective of corporate financing is to maximize shareholder value while managing the company's financial risk, which is different from financing with financial management and studies all financial decisions of companies. However, theories based on financial management, such as capital structure, the problem of leverage, and financial management goals, are related to financing goals [2].

Financing models Balancing two sources - equity and debt, should be closely managed as one of the financing methods of companies. Too much debt may increase the risk of repayment default, while too much dependence on equity may reduce the income and value of the four leading investors. Optimizing the company's capital structure by reducing the weighted average cost of capital to the lowest possible level is one of the financial activities of companies. The financing decision seeks to optimize the weighted average cost of capital by examining the capital structure of a company, especially the cost of equity and debt [16].

Debt financing occurs when a company raises money by selling debt instruments through bank loans or bonds. This type of financing is often referred to as leverage. As a result of taking additional debt, the company promises to repay the loan and incurs the interest cost [5].

On the other hand, financing for investment purposes includes profit maximization, which means that investment returns are maximized, and resources are allocated to support the most efficient use of capital. Shareholders are the primary beneficiaries of profit maximization because it ensures the highest return on their investment [3].

Non-cost financial resources include advance payments from customers, trade creditors, and dividends. Financial resources with cost are divided into internal resources (capital increase) and external resources (short-term and long-term facilities). Accounting Standard No. 13's purpose is to prescribe how to account for financial provision expenses. According to this standard, financing expenses are generally immediately recognized as period expenses, except when these expenses are referred to a qualified asset account [4]. The capital increase is one of the ways of financing companies. New financial resources are used to modify the capital structure or expand the company's activities, such

as increasing production capacity, launching development plans and company projects, and renovating machinery. Any change in the company's capital is exclusively within the competence of the Extraordinary General Assembly. This assembly is also valid with a two-thirds vote of the shareholders, whose financing is essential and in the process of increasing the capital [10].

On the other hand, the capital increase generally causes a decrease in the value of shares, which can significantly affect the ownership shares of founders and investors. Stock dilution exists in the shareholder's mind, even if a company has an investment plan to issue shares in progress or intends to launch one. Dilution, which occurs any time a company gives new shares to investors, significantly affects the value of a shareholder's portfolio. A company should adjust its earnings per share ratio and stock price during this period. Although stock dilution is usually viewed unfavorably, it can also signal buying that can improve stock performance in the future [11].

The usual sources for increasing the capital of public companies in Iran are as follows [12]:

**A. Capital increase from capital reserve:** Companies do not distribute the total profit earned during a year to their shareholders and keep a part of it as retained earnings. An increase in the capital from the accumulated place means that the company turns part of this accumulated profit into its nominal capital. Then, new shares are granted proportionally. An increase in wealth from this location increases the company's financing power. In this method, the shareholders do not pay any money to the company. Therefore, the company does not directly receive new financial resources, and the shareholders' ownership percentage remains constant and does not change [1].

**B. Increase of capital from the cash deposit:** In this method, the company issues a bond under the title of the preemptive right to purchase shares. According to each shareholder's ownership percentage and the percentage of the capital increase, a certain number of preemptive rights are provided to the shareholders. The final owners of the right of pre-emption must deposit money into the company's account under the name of the nominal value of the share to convert the right of pre-emption into shares [1].

The advantages of increasing the capital from cash can be pointed to the entry of new liquidity to the company. However, this method of raising capital is usually done in a long and time-consuming process, which may take months [12].

**C. Increase in capital from revaluation of assets:** Tangible fixed assets are normally recorded in a company's balance sheet at their book value. The company's investments are also registered at their cost price. Tangible fixed assets include land, buildings, machinery, and equipment. The book value is the assets' historical cost after deducting the accumulated depreciation. Therefore, the book value does not indicate their real and daily value [14].

**D. Capital increase by the method of shares:** Capital increase by using shares is one of the methods of capital increase. In this method, the company sells its shares through subscription at a price higher than the nominal price in the market. Then, the difference between the selling and nominal prices is either transferred to the savings account or allocated bonus shares to the company's former shareholders [14].

Investors and analysts have stated that they are risky if a company starts continuously offering additional shares because it has difficulty maintaining financial strength with current earnings and constantly needs additional financing.

Despite the potential stock decline, increasing capital stock can ultimately benefit investors. Capital increase for the company, which is increased by the sale of additional shares, can support the company's growth. When the company successfully invests the additional capital, the investors' final gain in stock price and dividend payment may be enough to compensate for the reduction in their shares [8].

## 2.1 Research background

Wang and Zhuang [17] investigated the financing strategy of small and medium enterprises focusing on environmental protection and supply chains in China. This study starts with supply chain financing in SMEs and examines how significant companies can provide financing to SMEs that do not harm the environment. The data analysis found that the major companies can help SMEs in financing the supply chain through prepayment to solve the problem of lack of environmental protection funds and enjoy the benefits.

Moon [13] examined the effect of the liberalization of liquidity constraints or competitiveness potential and R&D grants on foreign financing of innovation in Korea. The experimental results of the researcher show that companies

that receive research and development grants, compared to companies that do not receive, receive 22-32% less from external financing (loans or bond issuance). However, there are differences in the statistical significance of the results based on the specifications of the regression model. Financing and, as a result, capital increase through government financial assistance reduces the liquidity constraints of companies. For Korea's research and development program, separate amounts are provided as subsidies to volunteer companies with conditions.

Zhong et al. [7] investigated the effect of financing and raising capital on a manufacturer with limited capital. In this research, the researchers consider that the producer has to choose two channels for raising capital and financing: external financing, which means financing from the bank, and internal financing, which means financing from its shareholders and within the company. The researchers found that subsidizing can be optimal when operating efficiency is low as well as when it is very high. Furthermore, when the price per unit is high, the producer must accept a high-interest rate to facilitate earning more profit. As a result, financing and raising capital with both methods have advantages and disadvantages.

Mojahed [12] studied the effects of increasing the capital of joint stock companies in Iranian and American law. Based on this study, the need to increase capital in Iranian law is one of the cases that require the report of the board of directors, and the inspector or inspectors of the company must also approve the report. In this case, it is the Extraordinary General Assembly's responsibility to decide. In American law, the decision-making authority to increase capital is within the board of directors' authority. However, the company's articles of association can be adjusted so that the decision to raise the capital is the responsibility of the shareholders and the extraordinary general meeting. However, the basic principle is that only the board of directors has the power to decide to increase the capital. As a result, it is possible to expand the company's activity by increasing the capital and by, improving the liquidity situation, and increasing the financial power so that the companies do not need to borrow and receive loans and facilities from banks.

Matsusaka et al. [11] investigated the effect of economic policy uncertainty on the number of companies and the choice of financial instruments for raising capital. According to a three-stage sequential framework, firms raise more capital through debt financing during periods of high economic uncertainty compared to 6,834 publicly listed US nonfinancial firms. The findings showed that companies prefer debt financing to equity financing to avoid ownership dilution and high equity premiums. Increased leverage during periods of high economic uncertainty highlights the importance of examining the policy tools used to stabilize the economy.

Eskandar and Belouri [4] examined the moderating effect of financing from the place of the capital increase and the type of ownership on the relationship between the dividend policy and the quality of financial reporting. The results showed that the companies that pay more dividends have higher-quality accruals. In addition, the predictive power of profits increases as the dividends paid increase.

### 3 Methodology

In this qualitative research, the researcher understands the phenomena from the participants' perspective and in their specific institutional and social context through interpretation methods and procedures. The present study presents a strategic model for capital increase based on a library-field environment, cross-sectional, and descriptive survey.

#### 3.1 Population and statistical sample

The current research first addressed the nature of the factors affecting capital increase using the qualitative method and used the Grounded theory. In this method, sampling was done in a purposeful and theoretical manner. The grounded theory seeks to discover the most critical possible data about the subject based on interviews with experts and coding the texts of the interviews based on purposive sampling. Purposive sampling finds samples that can help explain the topic and research question. The samples are selected voluntarily and purposefully and not randomly from among the studied society, whose time domain is in the winter of 2022. The statistical population in the qualitative section is 16 financial managers of public companies and academic professors of financial management who need expertise. Expert conditions include the following:

1. Financial managers and professors who have master's and doctorate education.
2. Financial managers or professors with at least ten years of work experience.
3. Financial managers or professors who have scientific resumes in the field of finance.

The study population in the quantitative part consists of all the financial managers of public companies. Morgan's sample size estimation table was used to select research samples due to the lack of access to the amount of population variance to use Cochran's formula. About 5,000 people were considered according to the size of the population in the quantitative stage, and the sample size of the research was 400 people, refer to Morgan's sample size estimation table, and the questionnaire was distributed among them.

The interview questions were designed after reviewing the theoretical and empirical literature and asking the opinions of university professors. The texts were rewritten after the interview, and two questions were asked for the interview for preliminary investigation. Other sub-questions were also asked next to each question to understand the scientific experiences of the experts during the interview. During the interview, opinions were collected about the appropriate indicators to determine the influential factors of the capital increase model. The grounded theory's primary and secondary components were qualitatively analyzed and indexed by coding the interview texts. Table 1 shows the interview questions:

Table 1: Interview Questions

No.	Questions
1	If we define the capital increase as the process during which it provides the capital needed for debt financing and new investment activities of the company. From the point of view of shareholders, what factors are effective in increasing the company's capital? Explain.
2	Under what circumstances and from which sources and methods should companies raise capital to maintain the value of equity?

The reliability of the interview refers to the compatibility of the research findings. Reliability in the investigation of the interviewer is raised in stages such as the interview situation, transcription, and analysis. It is necessary to pay attention to the intra-subject reliability of the summaries made while typing the texts, in the reliability of converting to text and summarizing. Moreover, paying attention to the percentages reported by two coders is a method to determine reliability during the classification of interviews. The amount (percentage) of intra-subject agreement between two coders (which should be 60% or more) about an interview (analysis control) is also a method for the reliability of the analysis. In the current research, retest reliability and intra-subject agreement method were used to calculate the reliability of the conducted interviews, and the above criteria were obtained.

### 3.2 Implementation of the grounded theory

The grounded theory method started by conducting interviews, collecting, and coding data, so the researcher gained more skill in conducting preliminary exploratory interviews, which was very important for the research. The recorded records of the interviews were named and stored in a database, and this grounded theory was set based on the interviewee's name, the audio file of the interview, and the interview date. The primary data source in this research was interviews, so the initial interviews were exploratory and descriptive. After conducting each interview, interview-to-interview coding of the data obtained from the interviews was done, and theoretical codes emerged through open coding through the method of constant comparison of data. In the same way, 16 interviews were coded, and central and sub-categories emerged. Condensation and saturation of the core classes were done based on theoretical sampling, so the interview with the statistical population continued until the concepts of that category were condensed and enriched.

Implementing the grounded theory method is done simultaneously and sequentially, but it has been tried to show the simultaneous processes of implementing this method sequentially. In the same way, the number and initial conceptual codes of the interviews and the words of the interviewees who referred to a specific concept are briefly given to be presented in the process of implementing the method. Table 2 provides examples of inductive coding for interviews.

Table 2: Inductive coding

Part of the text of the first interview	
Objectives of raising capital	Suppose the purpose of the capital increase is to finance new projects. In that case, it can be said that the announcement of the capital increase does not negatively affect the stock price from a place other than revaluation.
Financing through a capital increase	Despite the legal burden for the company, financing through the offering of shares is a better option than increasing debts in terms of the weighted average cost of capital and the value at risk of the capital structure.

Following the qualitative analysis method, the known primary concepts were categorized into 14 sub-categories and eight main categories. Table 3 shows the main category, subcategory, and concepts.

Participation of shareholders in the company's investment plans	The amount of capital increase should be optimized so that the cost of capital is lower than the NPV of the company's economic plans.
Sources of capital increase	The capital increase is applicable when accompanied by significant sources of accumulated profit or growth from using shares (bonus shares).
Company restrictions on foreign financing	Interest rates also increased as inflation increased spontaneously. Therefore, foreign loans have become expensive for companies, reducing the benefits of domestic foreign funding to Iranian companies.
The effect of capital increase announcement on stock price fall	Falling stock prices is a phenomenon caused by the dilution of stocks and investors' feelings, and the announcement of capital increases from any place causes the fall of increased stock prices due to the formation of sales queues.
<b>Part of the text of the second interview</b>	
The effects of capital increase from asset revaluation on stock price fall	Revaluation of assets is an accounting calculation and is done because of its effects on strengthening the financial leverage most of the time when the objective of the managers is to finance the debts.
The effects of capital increase from retained earnings on the company's market value	The accumulated profit causes the current stock price to be valued more than the nominal price, which promises the health of the financial performance in terms of return on assets and equity.
Preventive actions of the company, such as pre-emptive rights and bonus shares	When the cost of such capital increases is to finance new investments, the expectations of investors and shareholders regarding the yield of the company's shares help to maintain the market value during the announcement of the capital increase.
Consequences of stock dilution	The number of additional shares issued and retained may affect the portfolio's value during share dilution. Dilution also affects the company's dividend in addition to the company's stock price. For example, a company's profit per share or profit per share can be 1000 Rials before issuing new shares, but after dilution, it may be 800 Rials. However, when the dilution significantly increases earnings, dividends may not be affected.
Sources of capital increase	Real capital-raising sources are when a company asks investors for additional money. Companies raise capital for various reasons, including financing, expansion, conversion of operations, acquisitions, or restructuring of their capital.

Table 3: The main category, subcategory, and extracted concepts in inductive coding

Main item	Sub-item	Concepts
Purposes of capital increase	Debt financing	Financial leverage, weighted average cost of capital, debt financing, bank loan, financing restrictions.
	New investment	Return on investment, the present value of the investment, capital increase, spending shares, funds, and investment amount. Cash income of shareholders.
Sources of capital increase	The capital increase from savings	The capital increase, funds, pre-emptive rights, significant shareholders, government ownership, and the above rules are correct.
	The capital increase from cash	The capital increase, bonus shares, significant shareholders, government ownership, and high correctness rules.
	The capital increase from the revaluation of assets	Capital structure, debt financing, internal financing, external financing, accumulated depreciation, new stock auction.
	Capital increase using shares	The capital increase, underwriting, bonus shares, significant shareholders, government ownership, high laws, and support of major shareholders.
Differences between the Tehran Stock Exchange	Oscillation range	Company market value, stock price, stock yield, the announcement of the capital increase, and upstream rules.
	Profit sharing percentage	Reserves, financing, capital increase, new investment, company characteristics, equity market value, market value to book value, profit per share.
Company characteristics	Earnings per share	Company profitability, stock return, new investment, company characteristics, market value of equity, market value to book value, dividend.
	Financial Leverage	Foreign financing, capital structure, bank loan, purposes of the capital increase, company characteristics.
	The ratio of market value to book value	Company profitability, stock return, new investment, company characteristics, equity market value, profit distribution.
Announcement of capital increase	The market value of equity	Company profitability, stock yield, new investment, company characteristics, reserves, share spending, weighted average cost of capital, market value to book value, and dividend.
	Abnormal stock returns	Company profitability, stock yield, new investment, company characteristics, the weighted average cost of capital, market value to book value, and the announcement of capital increase.
	Stock dilution	Announcement of the capital increase, revaluation of assets, purpose of the capital increase, resources of the capital increase, auction of new shares, and support of significant shareholders.

Theoretical matching means comparing emerging theories with existing theories. This step compares the emerging theory and its categories with previous theories. These current theories must be related to the phenomenon under investigation. Table 4 presents the identified components by various researchers.

Table 4: Components identified from previous research

Component	Sub-component	researcher
Purposes of capital increase	Debt financing	[1, 11]
	New investment	
Sources of capital increase	The capital increase from the reserve	[1, 2, 3, 4, 11, 14]
	The capital increase from cash	
	The capital increase from the revaluation of assets	
	Capital increase using share premium	
Differences in the stock market	Oscillation range	[1, 12]
	Profit sharing percentage	
Announcement of capital increase	Earnings per share	[3, 12]
	Financial Leverage	
	The ratio of market value to book value	
Company characteristics	The market value of equity	[8]
	Abnormal stock returns	
	Stock dilution	

The research results were more consistent and relevant when compared with the models related to the research results. According to the theorists of the grounded theory, current theories and categories were involved in the research achievements during the process of theoretical adaptation.

According to the comparison of previous researchers' opinions, all the components identified in the present model were confirmed.

#### Hypotheses and proposed model

According to the qualitative analysis, the hypotheses can be explained as follows:

1. Capital increase from the reserve or accumulated profit has an abnormal return due to the announcement of the capital increase of the companies.
2. The capital increase from the shareholders' cash flow has an abnormal return due to the announcement of the capital increase of the companies.
3. Capital increase from revaluation of assets has an abnormal return due to the announcement of capital increase of companies.
4. Capital increase from the share premium has an abnormal return due to companies' capital increase announcement.
5. The company's investment goals significantly affect the abnormal return due to the announcement of the capital increase of the companies.
6. The purpose of financing the company's debt significantly affects the abnormal return due to the announcement of the capital increase of the companies.
7. According to the Tehran Stock Exchange, the oscillation range significantly affects companies' capital increase.
8. Dividends have a significant effect on increasing the capital of companies.
9. The dilution of shares has a significant effect on the capital increase of companies.

According to the grounded analysis of the research, the structural model of the research is presented as described in Figure 1:

## 4 Pattern analysis results

Structural equation modeling is a multivariate statistical analysis technique used to analyze structural relationships. This technique combines factor and multiple regression analyses to examine the structural relationship between measured variables and latent constructs. Both Cronbach's alpha and composite reliability measures are used to better measure reliability in the structural equation method. If these two criteria are higher than 0.7, the reliability indicator is acceptable. Convergent validity represents the average variance extracted between each construct and its indicators. Fornell and Larcker [6] have introduced the appropriate value for AVE to be 0.5 or higher.

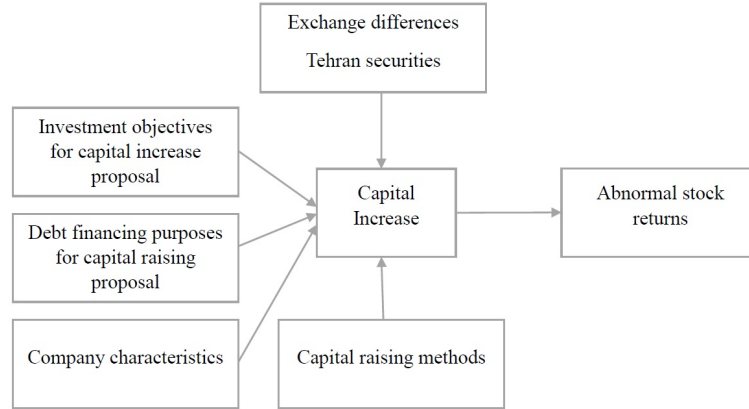


Figure 1: Proposed research model

#### 4.1 Structural equations in statistical terms

Least square regression is a statistical method related to principal components regression. This method finds a new space or linear regression model instead of finding the plane of maximum variance between the response variable and the independent variables by creating new predictor variables from the observed variables. Structural Equation Modeling (SEM) provides a model for finding these new predictor variables. Since both data series related to X and Y variables are imaged in new spaces, the family of the PLS method is known as the "Bilinear Factor Model."

Assume that the  $n \times m$  matrix contains independent variables and Y is the  $n \times p$  matrix of response variable values. The general model in structural equations with the PLS approach is expressed as follows.

$$X = TP^T + E$$

$$Y = UQ^T + F$$

T and U specify images X and Y, respectively. P and Q represent orthogonal matrices of factor loadings for two variables, T and U. In addition, E and F are random error terms.

There are various techniques to obtain the factors and factor loadings matrix. A regression model is usually built between X and Y variables, as follows.

In some PLS techniques, the variable Y must be a column vector, which is called univariate mode, which shows the multivariate mode in some methods. The PLS1 algorithm is among the most popular for solving PLS structural equations. In this algorithm, the Y variable is used as a vector. In addition, the matrix T is constructed by assuming autonormality.

The pseudo-code that can be seen below is written to introduce this algorithm. Uppercase letters indicate matrices, and lowercase letters indicate vectors.

This algorithm may cause inflation in the X matrix because the difference is as follows.

$$X^{k+1} \leftarrow X^k - t_k t^{(k)} p^{(k)T}$$

Nevertheless, inflation does not take place in the Y vector.

According to Table 5, the value of these criteria for all the structures of the model is higher than 0.7, which indicates the appropriate reliability of the model. As shown in Table 5, the AVE value of all variables is more significant than 0.5, which means acceptable convergent validity of the measurement model.

Path analysis (structural model) is a technique that shows the relationships between research variables simultaneously. Path analysis aims to identify the causality (effect) between the variables of the conceptual research model. Table 2 shows the structural model of the research in the form of standard coefficients and significant numbers.

Figure 2 indicates the measurement model of the dimensions of the impact of various factors on the capital increase and the role of its announcement on abnormal stock returns in the standard estimation mode.

Figure 2 represents the coefficients of factors affecting capital increase. Of the four sources of capital increase, the increase from the revaluation of assets is negative, and the other three sources (reserves, cash inflow, and spending on



**Algorithm 1**


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1: function PLS1 ( $X, y, l$ )
2:  $X^{(0)} \leftarrow X$ 
3:  $w^{(0)} \leftarrow X^T y / \|X^T y\|$ , an initial estimate of  $w$ .
4: for  $k = 0$  to  $l-1$ 
5:  $t^{(k)} \leftarrow X^{(k)} w^{(k)}$ 
6:  $t_k \leftarrow t^{(k)T} t^{(k)}$  (note this is a scalar)
7:  $\hat{t}^{(k)} \leftarrow t^{(k)} / t_k$ 
8:  $p^{(k)} \leftarrow X^{(k)T} \hat{t}^{(k)}$ 
9:  $q_k \leftarrow y^T \hat{t}^{(k)}$  (note this is a scalar)
10: if  $q_k = 0$ 
11:  $l \leftarrow k$ , break the for loop
12: if,  $k < (l-1)$ 
13:  $X^{(k+1)} \leftarrow X^{(k)} - t_k \hat{t}^{(k)} p^{(k)T}$ 
14:  $w^{(k+1)} \leftarrow X^{(k+1)T} y$ 
15: end for
16: Define  $W$  to be the matrix with columns,  $w^{(0)}, w^{(1)}, \dots, w^{(l-1)}$ , Do the same to form the  $P$  matrix and  $q$  vector.
17:  $B \leftarrow W(P^T W)^{-1} q$ 
18:  $B_0 \leftarrow q_0 - P^{(0)T} B$ 
19: RETURN  $B, B_0$ 

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Table 5: Convergent reliability and validity index values

Variables	Cronbach's alpha	CR composite reliability	The average variance extracted from AVE
Increase from reserve	0.709	0.745	0.538
Increase from cash	0.768	0.746	0.613
Increase from revaluation place	0.709	0.723	0.501
Increase from the share premium	0.782	0.735	0.581
Capital Increase	0.748	0.788	0.734
Abnormal stock returns	0.779	0.756	0.648
Tehran Stock Exchange difference (profit sharing)	0.679	0.688	0.556
Tehran Stock Exchange difference (oscillation range)	0.773	0.819	0.695
Profit sharing - characteristics of the company	0.899	0.805	0.698
Dilution of shares - characteristics of the company	0.708	0.735	0.649
Debt financing purposes	0.881	0.862	0.758
Investment purposes	0.702	0.772	0.523

shares) are positive. In addition, the relationship between stock dilution and capital increase is negative, and profit distribution is positive. The oscillation range has a negative relationship with a capital increase, while the relationship between the lack of profit-sharing restrictions and capital increase is positive. The level of significance and validity of model relationships are reported in Table 6.

Table 6: The results of examining structural relationships

Dimension	Path coefficients	t-statistics	Significance
The increase from reserve $\rightarrow$ capital increase	0.082	1.407	0.16
Increase from cash $\rightarrow$ capital increase	0.202	3.713	0.000
Increase from the revaluation $\rightarrow$ capital increase	-0.03	0.567	0.571
Increase from the share premium $\rightarrow$ capital increase	0.148	2.068	0.039
Capital increase $\rightarrow$ abnormal stock returns	0.387	9.092	0.000
The difference between Tehran Stock Exchange (profit sharing) $\rightarrow$ capital increase	0.018	0.303	0.762
The difference between the Tehran Stock Exchange (oscillation range) $\rightarrow$ capital increase	0.026	0.369	0.712
Profit sharing- company characteristics $\rightarrow$ capital increase	0.062	0.936	0.35
Dilution of shares-company characteristics $\rightarrow$ capital increase	-0.139	2.553	0.011
Debt financing purposes $\rightarrow$ Capital raising	0.061	0.872	0.384
Investment purposes $\rightarrow$ capital increase	0.262	4.524	0.000

The first hypothesis stated that the capital increase from the reserve or accumulated profit has an abnormal return on the stock due to the announcement of the capital increase of the companies. The obtained coefficients

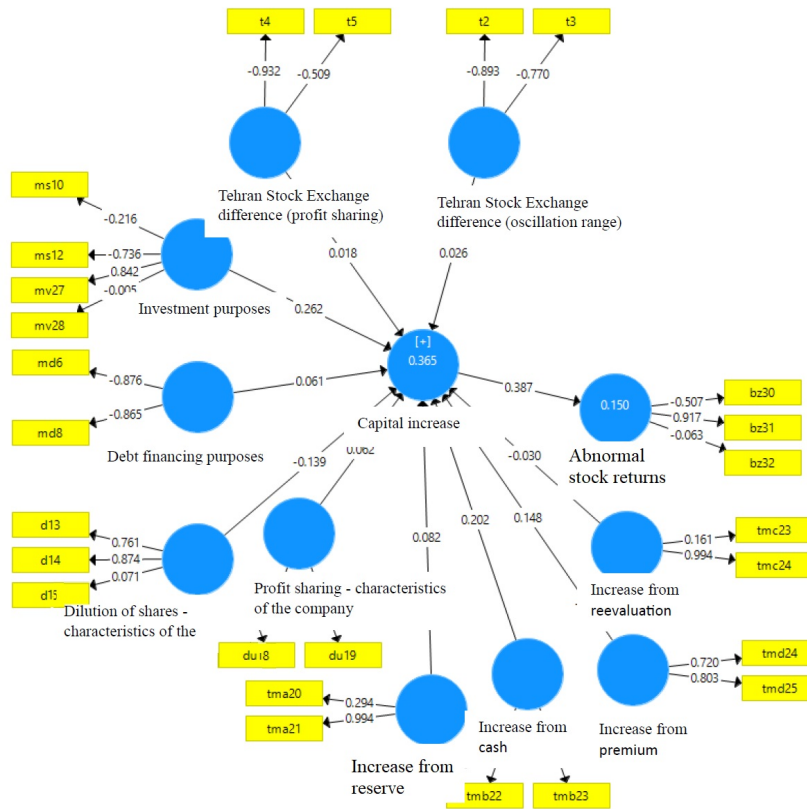


Figure 2: Confirmatory factor analysis of factors affecting the capital increase

were significant when testing the desired hypothesis using the structural equation model, whose significance test value was more critical than 1.96. As shown in Table 6, the standard coefficient of the effect of capital increase from the saved place on the capital increase is equal to 0.082. Considering that the observed t-statistic is less than 1.96, the significance of the obtained coefficient and hypothesis 1 was not confirmed.

The second hypothesis stated that the capital increase from cash affects the abnormal stock returns due to the announcement of the capital increase of the companies. Based on Table 6, the standard coefficient of the effect of capital increase on the capital increase was 0.202. Considering that the observed t-statistic is more than 1.96, the significance of the obtained coefficient and hypothesis 2 was confirmed.

The third hypothesis stated that capital increase from revaluation has an abnormal return on shares caused by the announcement of capital increase of companies. Table 6 shows that the standard coefficient of the effect of capital increase from the place of revaluation on the capital increase is equal to -0.03. Considering that the observed t-statistic is less than 1.96, the significance of the obtained coefficient and hypothesis 3 was not accepted.

The fourth hypothesis stated that the capital increase from the share premium affects the abnormal stock returns caused by the announcement of the capital increase of the companies. As shown in Table 6, the standard coefficient of the impact of capital increase from share premium on capital increase equals 0.148. Considering that the observed t-statistic is more than 1.96, the significance of the obtained coefficient and hypothesis 4 was confirmed.

The fifth hypothesis stated that the company’s investment intentions significantly affect the abnormal stock returns due to the announcement of the capital increase of the companies. Based on Table 6, the standard coefficient of the impact of the company’s investment intentions on the changes in the market value of equity due to the announcement of the capital increase is equal to 0.262. Considering that the observed t-statistic is more than 1.96, the significance of the obtained coefficient and hypothesis 5 are confirmed.

The sixth hypothesis stated that the company’s debt financing intentions significantly affect the abnormal stock returns due to the announcement of the capital increase of the companies. Table 6 indicates that the standard coefficient of the impact of the company’s debt financing objectives on the changes in the market value of equity due to the announcement of the capital increase is equal to 0.061. Since the observed t-statistic is less than 1.96, the significance of the obtained coefficient and hypothesis 6 are not confirmed.

The seventh hypothesis stated that the oscillation range, according to Tehran Stock Exchange, has a significant effect on the capital increase of companies. As shown in Table 6, the standard coefficient of influence of the oscillation range equals 0.026. Considering that the observed t-statistic is less than 1.96, the significance of the obtained coefficient and the hypothesis are not confirmed.

The eighth hypothesis stated that the lack of profit-sharing restrictions, according to the Tehran Stock Exchange, has a significant effect on the capital increase of companies. Based on Table 6, the standard coefficient of the impact of profit sharing equals 0.061. Considering that the observed t-statistic is less than 1.96, the significance of the obtained coefficient and hypothesis 8 are not confirmed.

The ninth hypothesis stated that stock dilution has a significant effect on the capital increase of companies. Based on Table 6, the standard coefficient of the effect of stock dilution is equal to -0.139. Considering that the observed t-statistic is more than 1.96, the significance of the obtained coefficient and hypothesis 9 are confirmed.

## 5 Conclusion

The capital increase is a relatively low-cost domestic financing method, which is not considered a priority for financing depending on various factors, such as the negative effects of stock dilution on abnormal stock returns when announcing a stock increase. This study was conducted to explain a model for increasing the capital of companies admitted to the Tehran Stock Exchange by a qualitative (Grounded theory) and quantitative (structural equations) method. According to the interviewees, important influencing factors on the capital increase, purposes of the capital increase, sources of the capital increase, two significant differences of oscillation range and lack of restrictions in Tehran Stock Exchange, as well as a range of company characteristics can affect capital increase and abnormal returns due to the announcement of capital increase. The findings are reviewed in Table 3 after theoretical adaptation.

Quantitative analysis revealed that the increase from reserves and revaluation of assets do not significantly affect the increase of capital and abnormal stock returns. While the increase of capital from cash and premium significantly affects the increase of capital and abnormal returns due to its announcement with coefficients of 0.2 and 0.148, respectively. In addition, the coefficient of influence of investment intentions on the capital increase is positive and significant. In contrast, the significance of debt financing intentions on the capital increase was not obtained from the analysis of the research model. According to quantitative analysis, the rules of the Tehran Stock Exchange do not impose a significant difference in terms of the scope of oscillation and profit distribution on the pattern of capital increase according to the theoretical literature. On the other hand, the phenomenon of stock dilution had a negative and significant effect on the capital increase and abnormal stock returns.

## References

- [1] A. Abbasi, *Examining the role of overinvestment in increasing the cost of capital and explaining the optimal model*, Master's thesis, Safadasht Branch, Islamic Azad University, 2018.
- [2] Y. Bary, *Illiquidity and stock return cross-sectional and time-series effect*, J. Financ. Market **5** (2015), 31–58.
- [3] W. Busaba, Z. Liu, and F. Restrepo, *Do underwriters price up IPOs to prevent withdrawal?*, J. Financ. Quant. Anal. **55** (2020), no. 6, 2005–2036.
- [4] H. Eskandar and A. Belouri, *The moderating effect of financing from the place of the capital increase and the type of ownership on the relationship between the dividend policy and the quality of financial reporting*, Account. Audit. Quart. **28** (2021), no. 2, 21–33.
- [5] I.V. Floros, N.J. Nagarajan, and S. Sivaramakrishnan, *The certification role of insider participation in PIPEs*, Rev. Quant. Financ. Account. **54** (2020), 1417–1447.
- [6] C. Fornell and D.F. Larcker, *Evaluating structural equation models with unobservable variables and measurement error*, J. Market. Res. **18** (1981), no. 1, 39–50.
- [7] Z.-Z. Jiang, G. Feng, and Z. Yi, *How should a capital-constrained servitizing manufacturer search for financing? The impact of supply chain leadership*, Transport. Res. Part E: Logistics Transport. Rev. **145** (2021), 102162.
- [8] J. Kucera, M. Vochozka, and Z. Rowland, *The ideal debt ratio of an agricultural enterprise*, Sustainability **13** (2021), 4613.

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- [9] M. Lotfi and A.M. Abdul Baghi Attabadi, *Behavioral analysis of stock returns based on asset pricing models in the framework of prospect theory: Evidence from companies listed on the Tehran stock exchange*, *Financ. Manag. Persp.* **11** (2021), no. 36, 91–118.
- [10] S.S. Mahmoudi, *Investigating the relationship between capital increase and dividend changes in companies listed on the Tehran stock exchange*, Master's Thesis, Department of Management, Behshahr Islamic Azad University, 2018.
- [11] J. Matsusaka, O. Ozbas and I. Yi, *Opportunistic proposals by union shareholders*, *Rev. Financ. Stud.* **32** (2019), 3215–3265.
- [12] A. Mojahed, *The effects of increasing the capital of joint stock companies in Iranian and American law*, *Quart. Tamdan Al-Jawiki* **1** (2022), no. 11, 13–66.
- [13] B. Moon, *Unleash liquidity constraints or competitiveness potential: The impact of R&D grant on external financing on innovation*, *European Res. Manag. Bus. Econ.* **24** (2022), no. 3, 100–119.
- [14] S.S. Naimi, *The relationship between capital structure, cost of equity, company risk and social and environmental reporting of the company in the context of the outbreak of Covid-19*, Master's thesis, Khayyam University, 2021.
- [15] C. Veld, P. Verwijmeren and Y. Zabolotnyuk, *Wealth effects of seasoned equity offerings: A meta-analysis*, *Int. Rev. Finance* **20** (2020), 77–131.
- [16] H.S. Vincent, S.L. Mairafi and Y.U. Abdullahi, *Effect of fixed income securities on capital market growth in Nigeria*, *Soc. Admin. Sci. Rev.* **7** (2021), 262–283.
- [17] H. Wang and X. Zhuang, *Financing strategy of SMEs based on the shortage of environmental protection funds*, *Proc. Comput. Sci.* **199** (2022), 15–25.