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A Long-term Casual Nexus between Stock Price and Dividends: Empirical Evidence from the Accepted Firms in Tehran Stock Exchange

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ABSTRACT

The concept of causality is a subjective phenomenon which has no objectives in this world; though all the discussions are focused on the causal relationships in all the scientific arguments. One of the methods to study the designed causal relationships objectively is Granger causality test. This paper aims to investigate the long-term causal relationship between the stock price and dividends. The statistical population includes 180 active companies in Stock Exchange of Tehran during 2010-2014. In order to analyze the achieved data statistically, the used specified model has been the regression model using the econometric data panel techniques and to test the research hypotheses and find the specific relationships among the variables, the descriptive-inferential statistics and Eviews software were used. Results indicated that the stock price is not due to the dividends; however, the dividends are the Granger causality of stock price. Also, the type of industry, firm growth index, and systematic risk index are of impact on the relationships between the stock price and dividends.

1. Introduction

The dividends policy is one of the most important discussions in the financial management field because the dividends indicate the cash payments of companies and is accounted for one of the most significant choices and decisions for the managers. The manager has to decide how much dividends should be invested in the company as the retained earnings. Although the shareholders directly enjoy the dividend returns, it will affect the firm ability concerning the retained earnings to profit from the growth opportunities. In fact, the main aim of financial reporting is to meet the information needs of investors. The investors and users are to predict the future performance and value the firm using the accounting information. Investors in stock exchange seek to achieve high profits. Thus, they purchase the shares which are regarded as the best ones with the most profits and outputs; as a result, they buy and keep them [4].

The firm policy with respect to the dividends is one of the elements which influence the firm value. It is assumed that the dividends have the adhesion property. The firms which reduce their dividends usually encounter the sharp decrease of their own value. Therefore, the managers tend to avoid the payment of high profits unless they are assured of their own capability in keeping high levels of dividends [1]. Stock price varies on the basis of supply and demand variations. If the number of buyers

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for one specific share is more, the demand of it is more than its supply; so, the price of that share will be increased and vice versa. Understanding the supply and demand and their price variations is simple but what is difficult seems to understand the supply and demand variations in stock exchange leading to the fact that some purchase a specific share or sell it [7].
The significance of recognizing the effective elements in the stock valuation may be to contribute to the correct transactions; consequently, the price of stock trading is more likely to reach the inherent price and reduce the stock crisis along with sharp variations of stock price. Actually, the market calmness and stabilization are due to the balance and order of stock pricing practices in the capital market through implementing the rational practical approaches of stock pricing seriously. Considering the effective elements and limitations in the dividends policy leads to the survival of firm with respect to the competition and development in addition to the maximization of shareholders' wealth. As well, the understanding of the relationship between dividends and stock price variations causes the firm growth and finally, the increased profitability in addition to the profits of investors. Thus, this paper aims to investigate the long-term causal nexus between the stock price and dividends in order to find solutions for the science advances. In fact, the main research question is whether there exists a long-term causal nexus between the stock price and dividends or not.

2. Research Theories and Background

It can be stated that the Granger causality test investigates whether the existence of a relationship and chronological priority is statistically accepted or not [8]. Shojae [5] stated that every shareholder can expect four types of output involving the dividends, the increased stock price, bonus shares, and stock buy priority for each share. Now, if it is supposed that one of the most important purposes of firm management is to increase the shareholder wealth, their financial decisions should be made in this respect. Izadinia and Alinaqian[1] believe that the dividends of firms are complicated and mysterious for the financial researchers and are controversial with regard to two important aspects.
On one hand, the dividends are considered as the effective element in the future investments of firms; the decreased dividends will cause the reduction of internal resources and the increase of needs to external financial resources. On the other hand, lots of shareholders tend to the dividends so that the managers must balance various interests of shareholders and the profitable investment opportunities in order to maximize the profit rate. Therefore, the decisions of dividends which are made by the managers are very sensitive and important [1].
First theoretical steps with regard to the dividends policy refer to the prediction of profit payment impact on the stock price. The payment of profits affects the behavior of stock price during a short-term period in two ways: first, the firms that pay the cash profits for the first time or increase the cash profit convey the good news to the market resulting in creating a positive output almost near the date of profit announcements.
Due to the regular increase of share profit payments in the market, this additive output is considered as a commitment to pay more profits in future. Firms often tend to pay the profits in a uniform manner; in other words, the cash profit is not increased and its reduction is intensely prevented. As well, when the share profit is paid, the official value of firm is reduced and an additive negative output is created. Second, through distributing one part of profits, firms have to provide more costs in order to provide the investment projects financially and equity. Signaling theory clarifies this vague aspect of dividends policy. Since the managers are informed of more information concerning the future profitability of firm as compared to the external investors, the increased dividends can have a better messaging of future perspective and experience higher stock price [21].

2.1 External Background

Ahmed and Murtaza[9] in a research on the analysis of effective elements in the payment of dividend have concluded that there exists a strong relationship between the liquidity, dividends, leverages, firm

size and dividends payment ratio. Also, they found a significant relationship between the dividend payment ratio and firm size in the future. Nirmala et al. [18] examining the long-term causal relationship between the stock price and dividends concluded that a long-term causal interaction regarded as a long-term Granger causality one exists between the stock price and dividends. Prabath and Menike [19] in a study on the recognition of effective elements in the stock price in Sri Lanka Stock Exchange using a population of 100 firms during 2008-2012 investigated the impact of share profit and book value per each share while utilizing a multiple regression model. Results indicated that the share profit, dividends and book value have considerable effects on the stock price.

2.2 Internal Background

Seyedi and Movahedpoor[6] in a research on the effective factors in the share quality and stock price have shown that the earning response coefficient (ERC) is weaker than that in the manufacturing firms. As well, the stock price before the convention has no meaningful difference with the price after that. The most important result in this research is that for the pricing of stock in the securities market, some other important factors rather than the annual dividends should be regarded. Biabani and Razi-Kazemi[2] stated that there always exists a conflict between the managers and shareholders on one hand and thousands of retail investors on the other hand. The purpose of retail investors is to achieve more cash dividends and tend to obtain their own profits in cash; on the other hand, they are willing to return the profits to the firm to be developed and as a result, the stock price will be increased. Shojae [5] in a comparison of dividends and stock price variations in food firms proposed that there is no meaningful relationship between the variations of dividends and stock price in Tehran Stock Exchange.

3. Hypothesis and Conceptual Model

Hashemijo et al. [16] in a research on the effect of dividends policy on the stock price variations in Malaysia Financial Market with a population of small businesses of 7 industries during 1998-2003 concluded that there was a negative relationship between the variations of stock price and these two variables. Izadinia and Alinaqian[1] recognizing the effective factors in the dividends using logit model stated that among the desired factors, uncertainty of cash flow, firm age, investment opportunities, and firm profitability influenced the payment of dividends. With respect to the theoretical basics, below hypotheses will be presented in order to achieve the research aim:

H_1: Stock price is the Granger causality of dividends (the delayed amounts of stock price are related to the current ones of dividends whereas the delayed amounts of dividends are not related to the current ones of stock price).
H_2: Dividends are the Granger causality of stock price (the delayed amounts of dividends are related to the current ones of stock price whereas the delayed amounts of stock price are not related to the current ones of dividends).
H_3: Industry type affects the relationship between the stock price and dividends.
H_4: Firm growth index affects the relationship between the stock price and dividends.
H_5: Systematic risk index affects the relationship between the stock price and dividends.
In Fig. 1, the conceptual research model is presented.

4. Methodology

This study is an applied one with a semi-empirical design using an after-event approach. The data used in testing the hypotheses are the panel data. The required information and research data have been collected through referring to financial statements and explanation notes of the selected firms, the library method and software of NovinRahavard and Tadbirpardaz Company. Research statistical

population involved all the accepted firms in Tehran Stock Exchange during 2000-2014. Sampling method was a targeted deletion one; the sampling stages with 182 firms and 900 data-years are presented in Table 1 to test the statistical hypotheses:

4.2 Research Variables and Model

To test the hypotheses 1-5, the models 1, 2, 3, 4 and 5 were used:

Sampling stages	Number
Number of firms accepted in Tehran Stock Exchange in 2014	520
Number of firms leaving Tehran Stock Exchange	44
Number of firms entering Tehran Stock Exchange	41
Number of firms having variations in financial year	37
Number of firms as investors and	85
Number of firms having a more than 6 months	106
Number of firms with no fiscal year of 12.29	29
Number of sample firms	182

β_0 = the width to the origin, $P_{it}$the market value of each share i in the period of t,D_{it} the cash profit of each share i in the period t,ΔP_{it} the variations of market value of each share i in the period t, ΔD_{it} the variations of cash profit of each share i in the period t,$SIZE_{it}$ the size of firm i in the period t,$LEV_{it}$the financial lever of firm i in the period t,$PROF_{it}$ the profitability of firm i in the period t,ε_{it} the rest of model β_0

$$\Delta D_{it} = \beta_0 + \beta_1 \Delta D_{it-1} + \beta_2 \Delta D_{it-2} + \beta_3 \Delta D_{it-3} + \beta_4 \Delta D_{it-4} + \beta_5 \Delta P_{it} + \beta_6 \Delta P_{it}^2 + \beta_7 \Delta P_{it-1} + \beta_8 \Delta P_{it-2} + \beta_9 \Delta P_{it-3} + \beta_{10} \Delta P_{it-4} + \varepsilon_{it}$$

$$\Delta P_{it} = \beta_0 + \beta_1 \Delta P_{it-1} + \beta_2 \Delta P_{it-2} + \beta_3 \Delta P_{it-3} + \beta_4 \Delta P_{it-4} + \beta_5 \Delta D_{it} + \beta_6 \Delta D_{it}^2 + \beta_7 \Delta D_{it-1} + \beta_8 \Delta D_{it-2} + \beta_9 \Delta D_{it-3} + \beta_{10} \Delta D_{it-4} + \varepsilon_{it}$$

$$D_{it} = \beta_0 + \beta_1 P_{it} + \beta_2 SIZE_{it} + \beta_3 LEV_{it} + \beta_4 PROF_{it} + \varepsilon_{it}$$

$$D_{it} = \beta_0 + \beta_1 P_{it} + \beta_2 SIZE_{it} + \beta_3 LEV_{it} + \beta_4 PROF_{it} + \varepsilon_{it}$$

$$D_{it} = \beta_0 + \beta_1 P_{it} + \beta_2 SIZE_{it} + \beta_3 LEV_{it} + \beta_4 PROF_{it} + \varepsilon_{it}$$

4.2.1 Dependent and Independent Variables

1- The variations of market value for each firm share = the market value of each share in the current year minus the market value of each share in the previous year divided by the market value of each share in the previous year.

2- The variations of cash profit of each firm share = the cash profit of each share in the current year minus the cash profit of each share in the previous year divided by the cash profit of each share in the previous year.

4.2.3 Control Variables

1- Firm size: Firm size can be computed through the logarithm of all assets of desired firm which have been presented in Table 8:

SIZE=LN(ASSET) *(1)*

$ASSET_{it}$: All the assets of firm i in the period t
LN: Natural logarithm

2- Financial leverage: Financial leverage may be calculated through all the debts divided by all the assets of firm which have been presented in Table 8:

LEV=DEBT/ASSET (2)
$DEBT_{it}$: All the debts of firm i in the period t.
3- Probability: Probability is extracted from the financial statements directly.

5.1 Descriptive Data

In Table 1, some concepts of descriptive statistics are presented. In Table 1, the average of dividends is given as 3365000 and the lowest and highest amounts of accruals were computed as 1000000 and 5200000, respectively. Number of observations was given as 595 ones based on the combined data.

5.2 Reliability Test of Variables

In Table 2, the unit root test of combined data is presented. Table 2 shows that this hypothesis is rejected according to the common unit root process and Levin, Lin and Chu (LLC) method at the significance level of 5%. Also, H_0 is rejected on the basis of single unit root, Im and Shin test, and ADF and PP methods with 119 sections and 595 observations at the significance level of 5%. Results of unit root test indicated lack of unit root concerning all the variables.

5.3 Analyses with Hypotheses

5.3.1 Analysis of H_1

Before testing the hypothesis, Granger causality test is utilized; results are presented in Table 3.
In Table 3, another point with regard to the test of H_1 and H_2 is that the panel data cannot be used due to the existence of delayed variable model so that the information of firms are tested by the means of a time-series test. Before testing the hypothesis, the reliability of applied variables must be accepted. Results have been reported in Table 4. According to Table 4, the dividends and stock price are reliable at the significance levels of 1, 5 and 10% using Dickey-Fuller test. Also, there is no linearity between the model variables. Results of testing H_1 have been reported in Table 5. According to Table 5, it is clear that the variables of right hand are not significant statistically and with regard to the investigation of Granger causality, the stock price is not the Granger causality of dividends so that H_1 is rejected.

5.3.2 Analysis of H_2

Test results of H_2 have been demonstrated in Table 6. In Table 6, the dividends are the Granger causality of stock price so that H_2 is accepted and it is clear that the increased number of delays may decrease the affectability coefficient. The important point is non-linearity of equation; the profit power factor of dividends variations is negative and its absolute value is lower than 1. It states that the increase of dividend variations is more likely to affect the decrease of stock price; its increase is somehow reductive and exponential.

5.3.3 Analysis of H_3

5.3.3.1F-LimerTest

Results of F-Limer test have been shown in Table 8.

In Table 8, computational F of three industries is more than that of desired Table at the probable level of 95%. H_0 is rejected according to the data combination method, and the other hypothesis, namely the presence of capability in the panel data method is accepted.

5.3.3.2 Hausman Test

Results of Hausman test have been demonstrated in Table 9.
In Table 9, the fixed effects method is more appropriate to test H_3 regarding the done calculations.

5.3.3.3 Estimation of Coefficients

Results of H_3 estimation have been shown in Tables 10, 11 and 12.
In Table 12, the probability statistic F is lower than 5%; thus, the model is statistically accepted. High F statistics indicate a strong relationship between the variables in the model. Coefficient of determination and the adjusted coefficient of determination show high explanatory power of model. Durbin-Watson statistic which is ranged as 1.5 - 2.5 can confirm the lacl of correlation in the mentioned model; though it is not necessary to investigate this statistic due to short time period. As it has been shown in Tables 11 and 12, t-statistic, standard error and p have been estimated for each variable. For the significance of each variable in the model, the column of p or the significance level should be referred. According to Table 12, the industry type influences the relationship between the stock price and dividends; in other words, in the expected industries, the stock price affects the dividends and it highly affects the dividends in the automobile industry so that H_3 is not rejected.

5.3.4 Analysis of H_4

5.3.4.1 F-Limer Test

Results of F-Limer test have been demonstrated in Table 13.
In Table 13, computational F is more than the table F; H_0 will be rejected based on the combined data method, and the hypothesis of capability in panel data method is accepted.

5.3.4.2 Hausman Test

Results of Hausman test concerning H_4 have been reported in Table 14.
According to the results of Table 14, Hausman test is more likely to be done since the combined data method was not accepted in F-Limer test; based on the performed calculations, the fixed effects method is more suitable for H_4.

5.3.4.3 Estimation of Coefficients

Estimation results of H_4 have been shown in Tables 15 and 16.
According to the results of Tables 15 and 16, the model is statistically accepted given that F probability statistic is lower than 5% and high F statistic shows a strong relationship between the variables in the model. The adjusted coefficient of determination indicates the explanation power of the independent variable which is able to explain the variations of dependent variable. Durbin-Watson test indicates the correlation rather than the accepted hypothesis. For each variable coefficient, the standard error, t statistic and finally, p have been estimated. The stock price affects the dividends in the firms with high and low growth; however, the impact coefficient is more in the firms with more growth.

5.3.5 Analysis of H_5

5.3.5.1 F-Limer Test

Results of F-Limer test concerning H_5 have been shown in Table 17. In Table 17, the fixed effects method has been chosen as the suitable one for testing H5 because of performed calculations.

5.3.5.2 Hausman Test

Results of Hausman test concerning H_5 have been reported in Table 18.

5.3.5.3 Estimation of Coefficients

According to Tables 17, 18 and 19, the model is statistically acceptable since the probability statistic is lower than 5% and high F statistic shows a strong relationship between the variables in the model. Coefficient of determination and the adjusted one indicate high explanatory power of model. The presented amount of Durbin-Watson statistic can confirm lack of correlation in the desired model; though, the significance of variables may be studied with respect to the value of p as compared to the values of p regarding the arbitrary error (α).

The estimated model of Table 17 is presented as follows:

$$D_{i,t} = 332.0366 + 0.007539\, P_{i,t} + 0.000298 SIZE_{i,t} - 42.8915 LEV_{i,t} + 3.85\, E - 0.5 PROF_{i,t} \quad (3)$$

Based on Table 18, the stock price affects the dividends in the firms with high and low risk; the impact coefficient is lower in the firms with low growth.

6 Discussions and Conclusion

This paper aims to find a long-term causal nexus between the stock price and dividends. Based on the results of linear and non-linear regression, the stock price is not the cause of dividends whereas the dividends are the Granger causality of stock price. Also, the industry type, growth index of firm, and systematic risk index affect the relationship between the stock price and dividends. Results of this research are somehow in accordance to the theoretical basics. Theoretical and empirical studies provided some useful suggestions regarding the dividends policy.

Although the existing theories in relation to the dividends policy have applied the approach of same pattern for all, the evidence shows that the dividends policy may vary in different firms. If it is supposed that one of the most important goals of firm management is to increase the wealth of shareholders, their financial decisions should be made in this regard. Since the implementation of dividends policy in the capital market leads to the increased stock price and the maximization of shareholder wealth, it seems that the decisions on the dividends are made in this respect. Several studies [11, 17] have confirmed the relationship between the stock price and dividends. Reschiter[20] reported that the variations of stock price are the Granger causality of dividends variations whereas the variations of dividends are not the cause of stock price variations.

Esteve and Prats[12] reported some evidence on the existence of a Granger relationship between the stock price and dividends whereas a long-term causal relationship between these two variables has not been studied [18]. According to the results of this paper, some suggestions are presented. According to the results of H_1, the stock price is not the Granger causality of dividends. Therefore, those who prepare the financial reports and statements are suggested to consider these results and determine the effective elements in the dividends in the capital market.

According to the results of H_2, the dividends are the cause of stock price. Confirming H_2 can lead to the conclusions and predictions on the direction of capital market decisions in relation to the stock price; thus, the obligation of firms is proposed to provide some information rather than the current data. The managers and investors are suggested to pay attention to such variables as dividends particularly in the logic decisions on the assessment of stock price.

Finally, providing the required trainings through Stock Exchange Organization for the shareholders, investors and stock experts is proposed to enhance the public preparation and introduce the Granger causality of stock price. According to the results of H_3, the industry type affects the relationship between the stock price and dividends; in other words, the industry type can make some changes in the dividends. Thus, it may be recommended that the managers should pay attention to the effective factors including the type of industry in the dividends. According to the results of H_4, the index of firm growth influences the mentioned relationship so that the investors are recommended to consider this

index while making decisions on buying and selling their own shares because it influences the studied relationship based on the research results.
On the other hand, Stok Exchange Organization should reveal more information on the growth indices of firms in order to make sure the users of financial statements for achieving sufficient information. According to H_5, systematic risk index has an impact on the desired relationship so that Stok Exchange Organization is suggested to obligate the firms to disclose more information concerning the systematic risk index. Researchers can separate the manufacturing and non-manufacturing industries, study the quality of dividens effects on the investment growth and the effects of information asymmetry on the stock price and the variations of unusual returns and investigate the causal nexus between the stock price and dividends.

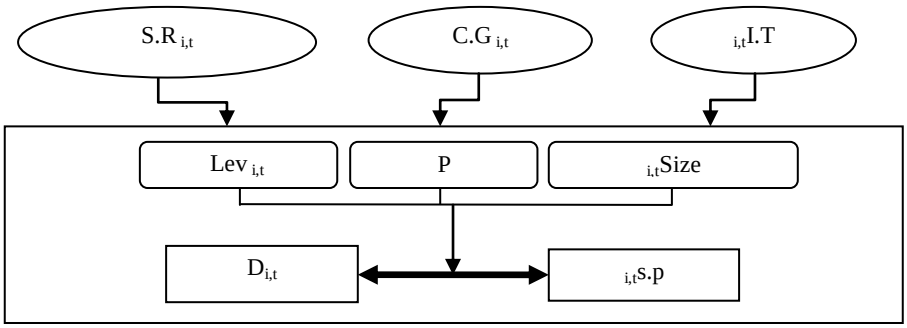

Fig. 1: *Conceptual research model*

Table 1: Descriptive statistics of research variables

	Dividends	Stock price	Firm size	Financial leverage	Profit
Average	336.5000	2991.296	6307.425	0.732042	117759.8
Mean	520.0000	1488.000	13.52000	0.725000	81513.00
Most	520.0000	15105.00	0.1510441	13.54000	6022865
Least	10.00000	5690000	11.43000	0.020000	-7204976.0
Standard deviation	206.7993	3859.845	97497.64	0.856120	1100177.0
Skewness	-0.345008	2.307767	15.39494	14.02288	-0.704116
Elongation	1.348303	7.112526	238.0042	210.4955	20.03379
Jack-bra	0.321554	0.865470	0.321540	0.431255	0.295477
Probability	0.685441	0.162547	0.685145	0.532474	0.712458
Sum	80760.00	717911.0	0.1513782	175.6900	28262345
Sum of standard deviation	10221060	3.56 E+09	2.27 E+12	175.1731	2.89E+14
Observations	595	595	595	595	595
Sections	119	119	119	119	119

Table 2: Reliability test of profit

Method	Test statistic	Probability	Number of sections	Number of observations
	H_0: Existence of	unit root	(common unit	root)
Levin, Lin and Chu	-31.12	0.000	119	595
t-student test	-26.06	0.000	119	595
W test	-35.13			
AFD-Fisher (two chi square)	21.61	0.000	119	595
PP-Fisher (two chi square)	51.14	0.000	119	595

Table 3: Granger causality test

H_0	F statistic	Probability level
Dividends are not the Granger cause of stock price	5.7	0.0155
Stock price are not the Granger cause of dividends	2.53	0.1147

Table 4: Unit root test of dividends and stock price

Variable	Crisis value	Statistic at 1% level	Statistic at 5% level	Statistic at 10% level
Dividends	-4.78	-3.92	-3.06	-2.67
Stock price	-3.96	-3.8	-3.02	-2.65

Table 5: Results of testing H_1

Variables	Coefficients	Standard deviation	t-statistic	t-probability level
C	-5.498131	14.07514	-0.390627	0.7043
DD 1	-0.013275	0.010736	-1.236477	0.2445
DD 2	-0.002153	0.016210	-0.132803	0.8970
DD 3	-0.008776	0.010576	-0.829849	0.4260
DD 4	-0.000392	0.009282	-0.042217	0.9672
DP	0.000720	0.011117	0.064802	0.9496
DP2	-1.39E-06	2.43 E-06	-0.572521	0.5796
DP 1	-0.159530	0.084230	-1.893983	0.0875
DP 2	-0.091702	0.075807	-1.209673	0.2542
DP 3	-0.309056	0.176907	-1.747002	0.1112
DP 4	-0.000367	0.024275	-0.015123	0.9882
	Determination of coefficient	Adjusted determination of coefficient	Durbin-Watson	F probability level
	0.68	0.55	1.83	0.001

Table 6: Results of H_2 test

Variables	Coefficients	Standard deviation	t-statistic	t-probability level
C	801.2348	624.4264	1.283153	0.2284
DD 1	0.321282	0.032384	9.921055	0.0000
DD 2	0.184020	0.048146	3.822157	0.0031
DD 3	0.081106	0.035204	2.303919	0.0224
DD 4	0.010381	0.002664	3.896498	0.0029
DD	-1.621622	9.318225	-0.174027	0.8653
DD2	-0.010047	0.002396	-4.193293	0.0001
DP 1	0.199011	0.028122	7.076631	0.0000
DP 2	0.120590	0.023660	5.096870	0.0000

DP 3	0.053862	0.005760	9.351140	0.0000
DP 4	0.199175	0.070513	2.824664	0.0048
	Determination of coefficient	Adjusted determination of coefficient	Durbin-Watson	F probability level
	0.83	0.82	1.93	0.000

Table 7: F-Limer test of H_3

	Statistic	Statistic	Degree of freedom	Probability level
Automobile parts industry	F Chi-square	77.5545 23.5	(26,104) 26	0.000
Pharmaceutics industry	F Chi-square	10.4319 32.6	(20,80) 20	0.000
Cement, lime and plaster industry	F Chi-square	12.6411 32.4	(17,68) 17	0.000

Table 8: Hausman test of H_3

	Chi-square statistic	Degree of freedom	Probability level
Automobile parts industry (n1=27)	36.082099	4	0.0000
Pharmaceutics industry (n2=22)	20.797333	4	0.0021
Cement, lime and plaster industry (n3=134)	22.618320	4	0.0000

Table 9: Estimation of model coefficients related to H_3 and automobile industry

Variable	coefficients	Standard deviation	t-statistic	probability
Width from source	94.20406	223.2571	0.421953	0.6739
Stock price	0.004138	0.000637	6.497454	0.0000
Firm size	0.271146	0.133148	2.036434	0.0442
Financial leverage	0.170958	0.012056	-1.418044	0.0000
Profit	3.97 E -05	6.17 E -06	6.427251	0.0000
Coefficient of determination		Adjusted coefficient of determination	Durbin-Watson	F probability level
698		0.615	2.313	0.0000

Table 10: Estimation of model coefficients related to H_3 and pharmaceutical industry

Variable	coefficients	Standard deviation	t-statistic	probability
Width from source	-14.54151	227.4588	-0.063930	0.9492
Stock price	0.003731	0.0030730	5.109538	0.0000
Firm size	0.341882	0.117380	2.912599	0.0046
Financial leverage	0.162295	0.016531	9.881777	0.0000
Profit	4.11 E -05	5.08 E -06	8.084005	0.0000
Coefficient of determination		Adjusted coefficient of determination	Durbin-Watson	F probability level
0.54		0.515	2.413	0.0000

Table 11: Estimation of model coefficients related to H_3 and cement, lime and plaster industry

Variable	coefficients	Standard deviation	t-statistic	probability
Width from source	153.8256	243.5841	0.631509	0.5298
Stock price	0.000949	7.94 E -05	11.95314	0.0000
Firm size	31.85046	10.48889	3.036590	0.0034
Financial leverage	-356.7464	196.6947	-1.813706	0.0741
Profit	3.94 E -05	4.48 E -06	8.780389	0.0000
Coefficient of determination		Adjusted coefficient of determination	Durbin-Watson	F probability level
0.654		0.54	2.23	0.0000

Table 12: F-Limer test of H_4

	Statistic	Statistic	Degree of freedom	Probability
Firms with high risk	F Chi-square	45.6539 6.23	(71, 284) 71	0.0000 0.0000
Firms with low risk	F Chi-square	51.2798 6.32	(188, 46) 46	0.0000 0.0000

Table 13: Hausman test of H_4

	Chi-square statistic	Degree of freedom	Probability
Firms with high risk	53.683862	4	0.0000
Firms with low risk	43.968798	4	0.0000

Table 14: Coefficient estimation of the model related to H_4 for the firms with high growth (n1)

Variable	coefficients	Standard deviation	t-statistic	probability
Width from source	367.945	61.32032	6.000377	0.0000
Stock price	0.05486	0.003591	15.27824	0.0000
Firm size	0.00071	7.91 E -05	8.999515	0.0000
Financial leverage	-90.3530	91.26214	-0.990039	0.3230
Profit	3.82 E -05	8.05 E -06	4.743394	0.0000
Coefficient of deter-mination		Adjusted coefficient of determination	Durbin-Watson	F probability level
0.698		0.615	2.313	0.0000

Table 15: Coefficient estimation of the model related to H_4 for the firms with low growth (n2)

Variable	coefficients	Standard deviation	t-statistic	probability
Width from source	347.372	75.83487	4.580639	0.0000
Stock price	0.00740	0.000420	17.62458	0.0000
Firm size	0.00500	0.000932	5.371757	0.0000
Financial leverage	-55.5695	107.3683	-0.517560	0.6054
Profit	3.83 E -05	8.24 E -06	4.621484	0.0000
Coefficient of deter-mination		Adjusted coefficient of determination	Durbin-Watson	F probability level
0.64		0.62	2.11	0.0000

Table 16: Results of F-Limer test concerning H_5

	Statistic	Statistic	Degree of freedom	Probability	Result
Firms with high risk	F Chi-square	47.3962 6.23	(68, 272) 68	0.0000 0.0000	Panel data
Firms with low risk	F Chi-square	51.2798 6.32	(188, 46) 46	0.0000 0.0000	Panel data

Table 17: Hausman test of H_5

	Chi-square statistic	Degree of freedom	Probability	Result
Firms with high risk	62.026346	4	0.0000	Fixed effects
Firms with low risk	43.968798	4	0.0000	Fixed effects

Table 18: Coefficient estimation of the model related to H_5 for the firms with high growth (n3)

Variable	coefficients	Standard deviation	t-statistic	probability
Width from source	332.0366	63.45620	5.232532	0.0000
Stock price	0.007539	0.003759	2.005702	0.0459
Firm size	0.000298	8.15 E -05	3.662673	0.0041
Financial leverage	-42.8915	94.02131	-0.456189	0.6486
Profit	3.85 E -05	8.24 E -06	4.672058	0.0000
Coefficient of deter-mination		Adjusted coefficient of determination	Durbin-Watson	F probability level
0.778		0.745	2.253	0.0000

Table 19: Coefficient estimation of the model related to H_5 for the firms with low growth (n4)

Variable	coefficients	Standard deviation	t-statistic	probability
Width from source	326.009	75.65078	4.309398	0.0000
Stock price	0.00768	0.000419	18.33039	0.0000
Firm size	0.00272	0.000937	2.905596	0.0217
Financial leverage	-29.1803	107.8791	-0.270491	0.7871
Profit	3.88 E -0.5	8.26 E -05	4.691693	0.0000
Coefficient of determination		Adjusted coefficient of determination	Durbin-Watson	F probability level
0.90		0.89	2.23	0.0000

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