

Modeling the block trades premium: focusing on refining and petrochemical companies

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Abstract:

Business expansions being engaged in variety of industries in purpose of getting bigger market share, role of corporate governance within the financial decision. One of the important issues in corporate governance is block trading with purpose of control or invest in target firms. If the plan is to acquire majority of shares and decision making, block trade along with paying premium are of great importance. The purpose of this study is to determine factors affecting on premium of block trading of firms listed in Tehran Stock Exchange or Iran Fara Bourse. Due to the significant impact of companies in refining and petrochemical sectors on whole economy and capital market, this kind of firms should have been considered specially. Multivariate regression and ordinary least squares (OLS) method was used to study the model related to the influential factors on the paid premium of the block trading. Finding of the research shows that financial structure, features of block trading, profitability and efficiency are among factors affecting on premium and also the type of company does not effect on premium.

Keywords: Regression Models, Financial Ratios, Tehran Stock Exchange, Iran FaraBourse

1 Introduction

Firms always seek to make decisions about their corporate governance and policies for the purpose of be better in market. One of these policies is acquisition of target companies. Among the ways that a company can acquired a target, block trading and premium paid is favorable. Since the literature relating acquisition and premium of block trading in every firm is applicable with given objectives for improving activities, and hence it is possible to help efficiency and effectiveness, this discussion becomes more and more meaningful.

Regarding that a definite and fixed model has not formed for this concept and investigate about factor affecting block trading premium in Iran capital market, it

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is necessary to identify models with high explanation power. Also in Iran little research has been made in this regard, and a comprehensive survey on major transactions made is required due to helpfulness of this issue in growth and improvement of among firms.

This study seeks to examine factors affecting premium paid in block trading based on variables extracted from financial statements and other relevant information including price trend of stocks transactions.

The anticipation made in this study may help predicting percentage of premium paid in block trading and could help company in making decision for better performance in process of acquisition a target firm, based on the corporate governance concept and issues related to block trading processes and bidding price for block trading. Examination of variables effective on the block trading premium by the purchaser finds significant importance.

Regarding the importance of refinery, and petrochemical firms within the Iranian capital market and the effect of their changes on the markets index and volume, attention is paid to identify firms that might be targets of acquisition. Therefore, examining premium of block trading for the firms that are active in this sector of economy, gains special importance. In addition, respecting article 44 of the constitution on privatization, by identifying factors effective on the premium of block trading that paid with the firms, appropriate decisions may be taken for the payment of premium in block trading of mentioned companies.

2 literature review and hypothesis development

One of the ways of acquisition a company is buy the appropriate shares of these target company through block trading process. Interactions of acquisition process take place in relation with decisions on other methods of external investment, internal development, change and redesign of structures and provision of financial resources and after evaluation different method as mentioned earlier, board of directors make a decision (Copeland, Weston and Shastri, 2004).

Targets for block trading must be evaluated in terms of time and its effects on target market, firm size, customer volume and activities available in the target firm, their income combination, and local and geographical conditions. The literature of the study expects two items of maximizing the wealth and maximizing firm growth opportunities.

Block trading and buy stock of targets firms take place with different purposes such as gaining profit as a result of difference between market value of the firms stocks in the market and the amount of their real price, capital and capability that is not used due to inefficient management, and with regards to the potential power existing in the company, achieving production line to make variety, profit resulted by economics of scale, synergy advantages, as well as other objectives.

To take control of a firm and acquire it, different methods such as merger, official

offers, controlling members of managers board, and sometimes a combination of the three methods would be used. Official offer refers to a condition under which an offer is made by the acquirer for a given number of target firms stocks. This offer is given to target firms shareholders in a price usually higher than market price of the firms stocks, which is called premium in acquisition process. Generally, shareholders decide individually on selling or rejecting offer of their stock in the target firm. The third type of acquisition takes place when a group of managers or shareholders who are not satisfied with the firm activities, attempt to take control of the firm through having power and influence in the board of managers (Copeland, Weston, and Shastri, 2004).

Hubris and cursing the winner theory has a long history in the literature of auction and block trading. When a big number of applicants or competitors come along with a subject of uncertainty about the value, the result would be high variety in offering different prices. The firm that paid high premium in block trading and win the bid, would lose its money because they generally offer a price which is higher than the real price, and would somehow curse the process. Capen, Clapp and Campbell (1971) have shown in a diagram based on their analyses in leasing sales competition that the proportion of high assessment of the value is a function of uncertainty and the number of competitors in a bid.

Roll (1986) have examined the effect of acquisition activities and showed that presence of a strong market efficiency in every market leads to reflecting a market value based on real net price of every firm. Higher valuation of applicants and their offers (higher than the real economic price of the target firm) is due to hubris (feeling of strength and pride produced by acquisition). This pride is one of the factors that create the notion of winners curse due to paid high premium in block trading.

Principal hypotheses about predicting premium of block trading and its procedure are of great significance. These variables may be studied at firms, industries, and the whole market levels, and they may be effective in predicting premium with regards to financial statements and existing literature. The literature of existing study indicate within discourses of firm control that factors such as inefficient management (that accompany with criteria such as reduced profitability) and imbalance in resources and firm growth play part in block trading premium. Motives and reasons of paid premium in block trading are vary in different times, industries, and firms.

Size of trading hypothesis and acquisition purposes, plays important role in premium of block trading. This hypothesis is divided into two parts: small size firms may become targets for acquisition, because in case of acquirers possibility for future growth, they would acquire more easily, with fewer resources and lower premium in block trading. On the other hand, it is a positive relation between size and possibility of acquisition, because managers prefer big scale activities over small scale ones. Consequently, in order to size, the acquirer tries to acquire those

firms payment of whose premium (proportion excess of paid amount to the market price) they afford. As studied by Asquith et al. (1983), the value of acquisition target firm is usually 10 percent less than the value of the acquirer. The theory related to growth maximization suggests that managers prefer big size acquisitions over small size ones. High degree of acquisition increase at mid-1980s indicates targeting acquisition process in big scales and paid higher premium in block trading (Hughes, 1989). On the other hand, Palepu believes that due to expenses exerted by acquisition, the relation between size and formation of acquisition is an inverse.

Studies on price changes of target firms stocks before block trading and acquisition were made by Dodd and Ruback (1977) and Asquith (1983), and their results indicated that the market identifies signals of a firms block trading and acquisition and its related offers in short term. Also, it was clarified in the studies that if there is a potential of identifying acquisition targets, abnormal return may be obtained that way when a company announced premium of block trading. When acquisition has been done through block trading, method of payment, cash or stock exchange is great item for abnormal return for the target firm. This abnormal return has been 25-30 percent. On average, the acquirer does not obtain abnormal return which implies expectations of market about gaining return only equal to the amount of cost of capital of that firm. In negotiated acquisitions, the acquisition applicant usually obtains 1-2 percent of abnormal return due to premium of block trading. All studies show a positive total return in acquisition samples. In the study on 364 cases of the biggest acquisitions between 1992 and 1998, Weston and Johnson (1999) found that in 65.4 percent of the transactions, the total returns have been positive. When acquisitions with negative return are removed from the sample, the total return for the sample would be positive, making acquisition and its consequent abnormal return help increasing the value.

Many studies have clarified that expected value changes in the target firm reflect the amount of premium. For instance, Devos et al. (2009) examined the profit gained due to synergy of big acquisitions between 1980 and 2004, where their result was a strong relation between estimation of synergy and paid premium.

Some discussions have been raised in a study conducted by Alexandridis, Fuller, Terhaar, and Travlos (2013) with regards to the grotesque approach in relation between the amounts paid in major transactions and the size of stocks under transaction. They concluded a negative relation between paid excess price in acquisitions and the firm size. The bigger the size of a firm, the more tending the offering firm to pay premium amount less than the one in the process related to major transaction.

In their study, Calcagno and Falconieri (2014) tried to examine the competition between different participants of bidding process to acquire target companies and to understand three issues:

- (i) Who wins acquisition and bidding process
- (ii) When this process takes place

(iii) How much is the premium paid for this acquisition

Their results indicate insignificance of paid premium difference upon direct negotiation or bidding for acquisition. The paid premium for acquisition always depends on the intensity of competition between competitors in acquisition process. Regarding acquisition process negotiations, their study was raised as the game of bargaining.

It was shown in this study, that acquisition premium increases when potential competition increases (according to Aktas et al., 2010). Also, the premium decreases with regards to increase in information expenses imposed on potential acquisition customers to enter into bidding process.

They could identify the expenses carried by the acquirer in bidding, and also evaluate the expense of finishing acquisition process, potential competitors and duration of negotiation.

The result of the study was that there is no significant difference between acquisition premium upon negotiation or bidding, and finishing time of acquisition period in direct negotiation mode is very short.

In her study (1997), Shahnaz Mashayekhi analytically examined the relation between stocks price changes and transactions effective on firm control about firms registered in Tehran stock exchange including 38 cases from early 1995 to early December 1997. The results of the study indicate that liquidity, possibility of transfer, structure of ownership, and right of vote were among factors effective on transactions prices. In a reviewed sample, the stocks with vote right, trade with 18 percent premium over the stock price in market. The higher the possibility of transfer and liquidity, the higher premium of transactions would be. Stocks without vote right and stocks with vote right for aspect of effectiveness on transaction possibility, were effective on transactions premium.

Asghar Arefis study (2012) examined the effect of stocks premium on major stock buyers return at Tehran stock exchange. To examine, major transactions (leading to firms management change) between 2001 and 2006 which have been picked in Tehran stock exchange, firms under question were classified under three groups of upper, middle, and lower firms. Results of the study show that in upper group, stocks premium are compensated by stocks return three years after the transaction, while this duration for middle and lower group firms would be only one year after the transaction.

In his study, Adel Zeini Sefidan (2013) examined factors effective on the price of stocks in major transactions at Tehran stock exchange in a sample consisting of 111 transactions done. In this study, examining the trend of changes in these types of transactions and different industries share from major transactions, factors affecting on price difference of major transactions (premium or discount) were examined. Results show that the variables of size and proportion of the firms limited stocks, the variable of internalizing the transaction due to insider information of major transactions, the proportion of stocks price to earning per share (P/E ratio) due to

future growth of the firm and changes in market indicator showing local conditions of the market, are among factors that affect stocks price difference in transactions. Table (1) shows a summary of studies made on the factors effective on paid in major transactions.

Table 1: Summary of literature

Researchers name	Examined feature	Result
Travlos	Premium payment method	Direct relation with offered premium of block trading
Sorensen	Profitability	Direct relation with offered premium of block trading
Hovakimian and Tehrani	Liquidity	Direct relation with offered premium of block trading
Kayhan and Titman	Growth opportunity	Direct relation with offered premium of block trading
Kayhan and Titman	Financial leverage	Inverse relation with offered premium of block trading
Devos et al.	Expected synergy	Direct relation with offered premium of block trading
Koch, Lefanowicz and Robinson	Presenting mid-term financial statements	Direct relation with offered premium of block trading
Alexandridis, Fuller, Terhaar and Travlos	Value of traded stocks	Inverse relation with offered premium of block trading
Calcagno and Falconieri	Intensity and conditions of competition in acquisition process	Direct relation with offered premium of block trading
Povel and Sertsios	Minor shareholders influencing the firms activity	Inverse relation with offered premium of block trading

With regards to the background of the study, one of the most important criteria in decision making about block trading was premium and predicting factors effective on paid premium of transactions by the acquirer is of great importance. This research investigates factors effect on premium paid in block which in national research has not been done yet. On the other hand, concentration of refinery and petrochemical industry firms is among purpose of the study. According to the literature review and research objectives, the hypotheses are as follow:

- (i) Financial leverage has inverse relation with premium in block trading.
- (ii) Firm liquidity has direct relation with premium in block trading.
- (iii) Percentage of the transaction value was paid in cash has inverse relation with premium in block trading.
- (iv) Transaction value in block trading has inverse relation with premium in block trading.
- (v) Firm's profitability has direct relation with premium in block trading.

- (vi) Growth opportunity in a firm has direct relation with premium in block trading.
- (vii) Premium paid in block trading of companies active in the petrochemical and refinery fields are greater than proposed premium in block trading of companies active in other industries.
- (viii) Purpose acquired a company has direct relation with premium in block trading.

3 Methodology

This study examines factors affecting on premium of block trading in Tehran Stock Exchange or Iran Fara Bourse. Population in this study included all of the companies having block trading within years of time scope of the study. We faced limitation for access to block trading data and we used filter for population studied as follows:

All of the block trading happened in time scope of the study, when the buyer was a legal entity (not a person).

All of the block trading where more than one percent of the company's stock was traded.

All block trading data, where information about transaction and type of premium payment was available.

According to these filters, the number of companies in population of the study was 265 data. In this study we used cross-sectional data and the number of observations was 265.

Quantitative data collection by stock exchange Companys website, data bank of securities and exchange organization, comprehensive distributors information system (Codal network). In the meantime, data on block trading, their price and date of certainty have been received from the Tehran securities exchange technology Management Company. Eviews and Excel software have been used to analyze data and obtain quantitative values of the variables.

Multivariate regression will be used to study the model related to the influential factors on the paid premium of the block trading.

Paid premium of block trading = $g(X_1, X_2, \dots, X_6, D, \text{acquisition probability})$

The data of the mentioned models will be cross-sectional, and the observations in specific times (on the occasion of the block trading or acquisition) in the companies.

Effective factors on the premium in block trading, studied by the multivariate regression and ordinary least squares (OLS) method. We tested classical linear regression model assumption and multicollinearity. To finding best model with proper variable's probability we used stepwise and backward method. For variable interpretation, t-ratio was used and for interpreting the model, F-ratio was used.

To study the question whether the refinery and petrochemical companies receive a higher major transactions premium or if they are more being acquired, separate studies in two models were necessary.

Therefore, the dummy variable was used in the models which only gets two values of (1) (refinery and petrochemical companies), and (0) (other companies).

ADF test: Using in researches is with this pre-assumption that examined process must be stationary. Therefore, before using the variables in studying the model, their stability or instability must be tested. Stability of the variables is determined by using the unit root tests (Brooks, 2008, p327). In this research, to study the stability of the variables, ADF test was implemented for the variables.

Multivariate regression has some assumptions known as classical linear regression model assumptions of the linear regression. Due to the needs of the research, these assumptions are studied in order to have the variables at the best estimations (best linear unbiased estimators).

Regarding the literature of this study and mentioned hypotheses, the following variables are examined in the study model.

a. Dependent variable

Premium of block trading: to define this variable, the percentage of block tradings price difference with the price of minor transactions of the transaction day (the end price of the stocks) was used.

b. Independent variables

In this study, controlling variables are referred to as firm features. These features are used under the title of descriptive variables in this study:

- (i) Financial leverage: studied indexes of this variable were effective on the paid premium in the block trading of a company.
- (ii) Liquidity: based on the provided definition, variables were effective on the premium in block trading.
- (iii) The premium payment method: the percentage of cash payment of transaction value is used to examine this variable in the model as the index.
- (iv) Transactions value: the market value of the block trading was defined as the index of this variable.
- (v) Profitability: the indexes of this variable were the return on equity (ROE), the price-earnings ratio of the stock and the return on total assets (ROA) of the firm.
- (vi) Growth Opportunity: the index was the average percentage of sale growth of the companies in past three years.

- (vii) Company type (D): we used the dummy variable into models for companies in the petrochemical and refinery fields.
- (viii) Acquisition a firm: regarding that if firms are acquired in block trading taken place, zero or one values are considered (value one for acquisition).

Table (2) which shows abbreviations used for variables in the research model:

Table 2: Abbreviations used for variables in models

Petro_du	:Dummy variable of refinery and petrochemical company
Acquisition	:Acquisition a company
Premium	: Premium paid in block trading
Cashpercpay	: Percentage of transaction value paid in cash
CurrentR	: Current ratio
QuickR	: Quick ratio
LongD_ Equ	: Long debt to equity
D_ Equ	: Debt to equity
ROE	: Return on equity
ROA	: Return on assets
IncomeGro	: Percentage of growth in income
PE	:Price to earning
Log(TV)	:Logarithm of transaction value

4 Result

Table (3) shows data descriptive statistics. For all the variables in this study descriptive statistics' parameters are demonstrated. (Numbers are inserted with 2 decimals):

Average of premium is 0.43 and this means in analyzed sample in average, 43 percent of premium is paid in block trading. Most and least premium is also 2.84 and -0.13.

Unit Root Test: As shown in table (4) null hypothesis is related to having a unit root. P-value in table (4) shows there's no evidence reject null hypothesis so it gives us the result that tested variables are stationary.

Multivariate regression model: According to number of variables in this research that are used in multivariate regression for determining effective factors in block trading, goal is getting a regression with high efficiency and knowing the variables that have most explanatory power. For betterment of the model we use step method and backward method, so we can remove the variables that are not statistically

Table 3: Descriptive statistics variables

Variable	Mean	Median	Maximum	Minimum	Std. Dev.
Acquisition	0.10	0.00	1.00	0.00	0.30
Longd_equ	0.19	0.08	2.24	-1.91	0.36
Log(TV)	26.25	26.36	31.99	20.55	1.97
Cashpercpay	0.62	0.50	1.00	0.03	0.38
Currentr	1.76	1.13	64.30	0.31	4.15
D_equ	3.86	1.38	27.48	-11.82	5.87
Incomegro	0.29	0.17	2.87	-0.92	0.47
ROE	23.57	22.94	153.91	-140.22	28.80
ROA	9.76	8.95	50.15	-37.56	13.15
Quickr	1.48	0.86	64.30	0.09	4.17
Premium	0.43	0.24	2.84	-0.13	0.48
Petro_dum	0.16	0.00	1.00	0.00	0.37
PE	9.99	5.74	488.75	-36.04	31.50

Table 4: Variables' stationary test, where number of observation is 265

Unit root test (ADF Analysis) Exogenous variables: Individual effects				
Method	Statistic	P value	Cross sections	observation
Null: Unit root				
Levin, Lin & Chu t	-41.6343	0.0000	13	3445
Null: Unit root				
Im, Pesaran and Shin Wstat	-43.9511	0.0000	13	3445
ADFFisher Chisquare	1856.45	0.0000	13	3445
PPFisher Chisquare	2550.8	0.0000	13	3445

significant and can analyze the final model which get to interpret variable coefficient. In next part there's explanations is presented for all the steps mentioned above.

According to given explanation first the following regression model is examined: Premium = f (Acquisition, LongD_Equ, D_Equ, CurrentR, QuickR, Cashpercpay, Log (TV), ROE, ROA, PE, IncomeGro, Petro_dum)

The result of done regression is shown in table (5) which is presented as general regression model (coefficients are given three decimals):

According to regression model, results show that only a percentage of value of block trading premium paid in cash, return on equity, return on assets and debt

Table 5: Multivariate regression where $N = 256$ is included observations

Multivariate Regression Least Squares: N				
Variable	Coefficient	Std. Error	t-Statistic	P-value
Constant	0.113325	0.512756	0.221012	0.8253
Acquisition	0.092696	0.092135	1.006087	0.3153
Longdequ	0.099927	0.086082	1.160828	0.2468
D-equ	-0.018156	0.005522	-3.288169	0.0012
Currentr	0.098324	0.0856	1.14865	0.2518
Quickr	-0.096027	0.084526	-1.136063	0.257
Cashpercpay	-0.34539	0.084955	-4.065559	0.0001
Log (TV)	0.023115	0.018474	1.251208	0.212
ROE	0.004379	0.001233	3.551997	0.0005
ROA	-0.017115	0.002787	-6.141382	0.0000
PE	-0.001112	0.000864	-1.286659	0.1994
Incomegro	0.040434	0.062281	0.649228	0.5168
Petro_dum	-0.032182	0.077993	-0.412628	0.6802
Ordinary Least Squares Regression results				
R-squared	0.218187	F-statistic		5.837389
Adjusted R-squared	0.18081	Prob(F-statistic)		0.00000
S.E. of regression	0.437493	Mean dependent var		0.427825
Sum squared resid	48.04152	S.D. dependent var		0.483369
Akaike info criterion	1.232478	Schwarz criterion		1.408567
Hannan-Quinn criter.	1.303236			

to equity ratio are meaningful on probability value of 1 percent and 5 percent and other variables in above model, are not meaningful in mentioned probability value. Mentioned coefficient in model shows dependent variable changes related to independent variable when all the other variables are fixed. In interpreting the coefficients we must pay attention to the measures. For example coefficient 0.3456390 with negative attitude shows that if one percent is added to percentage of transaction value paid in cash, premium percentage of this deal will decrease for 0.345390 units and this change is statistically meaningful and important. According to the model, return on equity and return on assets are in order in positive and negative relation with the premium of block trading. Debt to equity ratio has inverse relation with premium in block trading and.. Defining a dummy variable for petrochemical and refinery companies is a means to analyze this group separately and their effect on block trading's premium. With analyzing this coefficient we can understand inverse the relation between this variable and premium in block trading percentage is 0.032 although this variable is not meaningful in probability value 5 percent.

In cross-sectional data and multivariate regression, Homogeneity of variance which is one of the classic assumptions of multivariate regression is a lot important. In table (6) results of Breusch-Pagan-Godfrey test for first model is presented:

Table 6: Breusch-Pagan-Godfrey where included observation is 265

Breusch-Pagan-Godfrey test Dependent Variable : RESID ²				
Variable	Coefficient	Std. Error	t-Statistic	P-value
Constant	0.636896	0.569715	1.11792	0.2647
Acquisition	0.052457	0.10237	0.512429	0.6088
Longdequ	0.067835	0.095645	0.709237	0.4788
Dequ	-0.01623	0.006135	-2.645561	0.0087
Currentr	0.028956	0.095108	0.304451	0.761
Quickr	-0.032592	0.093915	-0.34704	0.7289
Cashpercpay	-0.103092	0.094392	-1.092164	0.2758
Log (TV)	-0.012219	0.020526	-0.595312	0.5522
ROE	0.000559	0.00137	0.408002	0.6836
ROA	-0.008347	0.003096	-2.695764	0.0075
PE	-0.001332	0.00096	-1.387022	0.1667
Incomegro	0.151203	0.069199	2.185029	0.0298
Petro_dum	0.055026	0.086657	0.634981	0.526
Testing Homosecedasticity Using Breusch-Pagan-Godfrey test				
F-statistic	1.797112	Prob. F (12,251)		0.049
obs*R-squared	20.88766	Prob. Chi-Square (12)		0.052
Scaled explained SS	69.54687	Prob. Chi-Square (12)		0.0000

By analyzing this test we see that P-value is lower than 0.05 for F variable which shows us which violated one of the classic assumptions and Homogeneity of variance.

To reach the optimum model which all variables are meaningful in it, model to be interpretable and classic assumptions not be violated, we can use stepwise approach with a backward approach for estimate model, effective variables and estimate meaningful coefficients. In this state according to definition in Eviews software for this approach, all independent variables are analyzed according to their meaningfulness level and are removed in stepwise way so that all the variables which aren't meaningful be out and we have an optimum model which all coefficients are meaningful in it.

For understanding this approach, table (7) shows first remove of a variable which has a higher P-value compared to others. Presented model is related to removal of

dummy variable for refinery and petrochemical companies.

Table 7: Multivariate regression after removal of dummy variable (petrochemical and refinery companies)

Multivariate Regression: Least Squares Included observations: 265				
Variable	Coefficient	Std. Error	tStatistic	Pvalue
Constant	0.139943	0.507844	0.275563	0.7831
Acquisition	0.093613	0.091956	1.018015	0.3096
Longd equ	0.097124	0.085673	1.133664	0.258
Dequ	-0.017752	0.005425	-3.272153	0.0012
Currentr	0.10136	0.085142	1.190472	0.235
Quickr	-0.099202	0.084036	-1.180473	0.2389
Cashpercpay	-0.344067	0.084755	-4.059556	0.0001
Log (TV)	0.021787	0.018162	1.199629	0.2314
ROE	0.004375	0.001231	3.554631	0.0005
ROA	-0.017129	0.002782	-6.157073	0.0000
PE	-0.001107	0.000863	-1.283527	0.2005
Incomegro	0.042785	0.061918	0.690992	0.4902
Ordinary Least Squares Regression results				
R-squared	0.217657	F-statistic	6.373568	
Adjusted R-squared	0.183507	Prob(F-statistic)	0.00000	
S.E. of regression	0.436773	Mean dependent var	0.427825	
Sum squared resid	48.07411	S.D. dependent var	0.483369	
Akaike info criterion	1.225581	Schwarz criterion	1.388124	
Hannan-Quinn criter.	1.290896			

As you see with removal of first variable which has the most P-value, we get better model that has the four meaningful variables and they have the same coefficients sign, other variables P-value are also improved but still none of them are meaningful. With the same approach we do rest of steps till we reach a model which in it all the coefficients are meaningful and classic assumptions related to multivariate regression and ordinary least squares is not violated. According to this process in order variables of average growth in income, company acquisition, long-term debt to equity, price to earning per share, logarithm of market value of block trading, quick ratio and current ratio are removed to optimize the model. Finally in the optimal model after removing the said variables according to mentioned arrangement, we get the table (8):

Table shows that four variables which mentioned in early model are still meaningful with their first sign. Variables in this model are entirely meaningful in

probability value of 1 percent and 5 percent. The percentage of transaction value paid in cash variable has a 0.362560 coefficient with negative sign and it shows if more than one percent of block trading value is paid in cash, premium percentage in block trading will decrease for 0.362560 units. Return on equity coefficient is related to premium directly. This variable coefficient shows that if return on equity increases for one percent, premium in this block trade increases for 0.003737. Return on assets ratio is in inverse relation with premium percentage in block trading. If this ratio increases one percent, premium on this block trading will decrease as amount of its coefficient, by 0.014988. Debt to equity coefficient is related to firms financial structure and this ratio has diverse relation with premium. This variable coefficient shows that if debt to equity increases for one percent, premium in this block trade decrease for 0.018059.

All the coefficients gathered with research literature used in the block trading premium are compatible. Only we need some explaining about ROA coefficient. According to negative sign of this coefficient debt to equity variable and the fact that assets of this company is composed of these two, you can say that although ROA is a good thing for this company and we must pay attention to it in block trading but the percent of debt including assets is important in decision making and high proportion for debt in capital structure can cause a negative attitude towards ROA. Positive sign for ROE coefficient says that the more return on equity increases, premium for its block trading gets more. Negative coefficients for percentage of cash paid to total transaction value and debt to equity ratio show that the more cash paid percentage in premium of block trading and debt to equity increases, premium

Table 8: Multivariate regression

Multivariate Regression: Least Squares Included observations: 265				
Variable	Coefficient	Std. Error	t-Statistic	P-value
Constant	0.779192	0.068945	11.30158	0.0000
D-equ	-0.018059	0.005051	-3.575117	0.0004
Cashpercpay	-0.36256	0.073662	-4.921936	0.0000
ROE	0.003737	0.00107	3.491454	0.0006
ROA	-0.014988	0.00234	-6.404662	0.0000
Ordinary Least Squares Regression results				
R-squared	0.193699	F-statistic	15.61507	
Adjusted R-squared	0.181295	Prob(F-statistic)	0.00000	
S.E. of regression	0.436559	Mean dependent var	0.427512	
Sum squared resid	49.55179	S.D. dependent var	0.48248	
Akaike info criterion	1.198901	Schwarz criterion	1.266443	
Hannan-Quinn criter.	1.226039			

in block trading is declined.

F-static in model is 15.6 and P-value of this variable shows meaningfulness of total regression and estimates done and according to these results, the totality of model and its coefficients can be accepted. In above model variables are made meaningful and in mentioned probability value, interpretation of final model is presented. According to model tests done for model's performance, accuracy and classic assumptions test related to it is as following:

Assumption 1: $E(u_t) = 0$

The first assumption required is that the average value of the errors is zero. In this model we have constant term in the regression and the first assumption is accepted and never be violated (Brooks, 2008, p.131)

Assumption 2: $\text{Var}(u_t) = \delta^2 < \infty$

For testing this assumption we can use the heteroskedasticity test from residual test and for cross-sectional data, choosing Breusch-Pagan-Godfrey type. Table (9) shows result of this test:

Table 9: Homogeneity of variance test where included observation is 265

Breusch-Pagan-Godfrey test Dependent Variable : RESID ²				
Variable	Coefficient	Std. Error	t-Statistic	P-value
Constant	0.327942	0.083355	3.934283	0.0001
Acquisition	-0.013983	0.005871	-2.381499	0.018
Longd-equ	-0.045097	0.075601	-0.59651	0.5514
D-equ	0.000699	0.000826	0.846655	0.398
Current	-0.007752	0.003459	-2.241381	0.0258
Testing Homoscedasticity Using Breusch-Pagan-Godfrey test				
F-statistic	2.873626	Prob. F (4,260)		0.0235
obs*R-squared	11.21954	Prob. Chi-Square (4)		0.0242
Scaled explained SS	40.55297	Prob. Chi-Square (4)		0.0000

As shown in table F-Statistic value in this test is equal to 2.87 and related P-value is 0.02 which shows reject the Homogeneity of variance in target probability value. For fixing this error we can use help of auxiliary regression and Newey west approach, calculations about estimating models is redone. This approach fixes the problem with Homogeneity of variance in a way that it doesn't cause any errors for estimating model and its coefficients with assuming variable's coefficients fixed. With assuming the Homogeneity of variance P-value checks the variables. In case that P-value of coefficients in target probability value is still meaningful, we can assume it's a suitable model for estimating. Results gathered from this approach are presented in table (10) shown below: According to results of table shown and

Table 10: Newey-West HAC test

Newey-West HAC Standard Errors & Covariance (lag truncation=4) Dependent Variable & Method : Premium - Least Squares Included observation : 265				
Variable	Coefficient	Std. Error	t-Statistic	P-value
Constant	0.779192	0.102446	7.605863	0.0000
Acquisition	-0.018059	0.006446	-2.801707	0.0055
Longd-equ	-0.36256	0.092813	-3.906358	0.0001
D-equ	0.003737	0.001183	3.159639	0.0018
Currenttr	-0.014988	0.004084	-3.670376	0.0003
Ordinary Least Squares Regression results				
R-squared	0.193699	F-statistic	15.61507	
Adjusted R-squared	0.181295	Prob(F-statistic)	0.00000	
S.E. of regression	0.436559	Mean dependent var	0.427512	
Sum squared resid	49.55179	S.D. dependent var	0.48248	
Akaike info criterion	1.198901	Schwarz criterion	1.266443	
Hannan-Quinn criter.	1.226039			

P-value gained for variables, coefficients gathered are suitable and Homogeneity of variance assumption is not violated.

Assumption 3: $Cov(u_i, u_j) = 0$ for $i \neq j$

In Cross-sectional data if the data related to each other with region or one bold Characteristic, autocorrelation must be test. According the data used in this search we do not need to test autocorrelation and assumption 3 does not be violated.

Assumption 4: The X_i are non-stochastic

With regards of the cross-sectional data in this search, x_i and u are independent and this assumption does not be violated.

Assumption 5: The disturbances are normally distributed

Being normal is one of the classic assumptions which needs to be checked and normally disturbing must be tested in final model, normality test in final model is shown in figure (1): In analyzing results gained from the figure in addition to descriptive statistics related to disturbance, we checked normality with Jarque-Bera test. This test and probability gained for it shows that distribution is not normal. According to central limit theorem and number of examples analyzed in this research we can analyze normal distribution and use the analyzed model.

For sample sizes that are sufficiently large, violation of the normality assumption is virtually inconsequential. Appealing to a central limit theorem, the test statistic will asymptotically follow the appropriate distributions even in the absence of error normality (Brooks, 2008, p.164)

We can see that according to figure, results show abnormality but based on

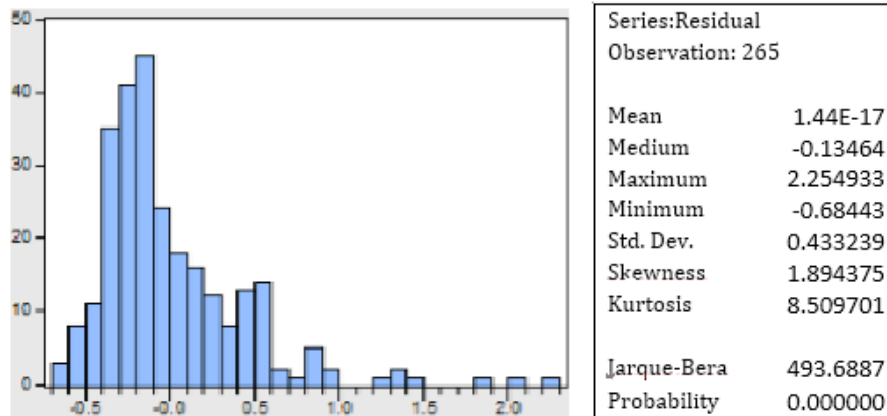


Figure 1: Figure 1 normal distribution test

central limit theory and the fact that observations are more than 30 asymptotic, normality assumption is accepted (This assumption is used for every model which is brought further on, based on same logic and interpretation). For testing the multicollinearity between variables, first we use covariance analysis if variables are correlated, then use variance inflation factors (VIF). Variance-covariance matrix between variables in final model is as described in table (11):

Table 11: Variables' collinearity test

Covariance Analysis: Ordinary Included observations: 265				
Correlation Probability	D.equ	Cashpercpay	ROA	ROE
	1.000000			
D.equ	---			
Cashpercpay	-0.182701	1.000000		
ROA	0.0028	---	1.000000	
ROE	-0.310254	-0.065204	0.435105	1.000000
	0.000	0.2903	---	
	-0.338124	0.089384	0.000	---
	0.000	0.1468		

This table shows the possibility of collinearity between debt to equity variable with other model's variables and return on equity and return on assets. Although resulted values based on Gujarati definition causes no error on correlation in model. For further more analysis we use VIF approach which results related to this test is shown below in table (12):

According to presented table and mentioned topics around VIF values, correlation between final model variables causes no error. Based on the estimated final model and its results and also classic OLS assumptions which explained thoroughly, related test examined, we can gather that estimated model has a suitable explanatory potential and descriptive BLUE variables. According to explanations given model for percentage of premium paid in block trading and its effective variables work based on this formula:

$$\text{Premium} = 0.7791920.018059 \text{ D_equ} - 0.362560 \text{ Cashpercpay} + 0.003737 \text{ ROE} - 0.014988 \text{ ROA}$$

5 Conclusions

For decision making about premium paid in block trading, boarder of companies and management must pay attention to different aspect of target companies. In this way, purpose of this study was investigation the relation between premium of block trading and different aspect of company. Financial structure (debt to equity), features of block trading (percentage of total transaction paid in cash), profitability and efficiency (return on equity and return on assets) are among factors affecting on premium. In this paper we found that the type of company (refinery and petrochemical) does not effect on premium.

We must pay attention to limitations in executing this research which are as follows:

- (i) According to defined filters, studied population was included 265 block trading in companies during early 2009 till 2015 in different industries. In any industry, there is different mechanism and the factors affecting on premium should be analyzed separately but a small number of observations in each industry causes some limitation on analyzing industry situation properly. So we need to be cautious about extending the results.
- (ii) According to growth and fall of stock market index in time of doing research

Table 12: Variance Inflation Factors test

Variance Inflation factors Included observations: 265			
Variable	factor Variance	Uncentered VIF	Centered VIF
Constant	0.010495	12.77643	NA
Acquisition	4.15E-05	2.920364	1.685156
Longd-equ	0.008614	7.02374	1.045379
D-equ	1.40E-06	3.006218	2.14975
Currentr	1.67E-05	5.468012	3.011298

Table 13: Comparative study on results of factors affecting on premium paid in block trading

Result of this study			Past study		
			Result		Researcher
Financial leverage (Debt to equity)	Negative and significant	and	Negative and significant	and	Kayhan and Titman (2007)
Percentage of transaction value paid in cash	Negative and significant	and	Negative and significant	and	Travlos (1987)
Profitability (ROE)	Positive and significant	and	Positive and significant	and	John, Ferris and Makhija (2012)
Profitability (ROA)	Negative and significant	and	Positive and significant	and	John, Ferris and Makhija (2012)

and significant changes, we need to consider the features of the market.

- (iii) There was only data about block trading done by legal entities with more value than 1% of company's share in this research. Therefore it was not possible to analyze block trading done by individuals or minor deals in market. This ended in adjustment of observations which effects extending results and needs to be considered.

According to research literature, methodology, tests done for analyzing hypotheses, suggestions based on results are as following:

- (i) Investment companies and stakeholders' companies, should pay attention to effective factors on deciding about block trading features and consider them in their decision making model.
- (ii) Government and privatization organization can pay attention to the result of this research and effective factors in the model can be considered while doing a privatization operation and getting 44th constitution policies done.
- (iii) Although block trading done in time of research where done by legal entities, but according to high likelihood of results between this and past researches it seems that models and effective factors on this research can be extended to individuals as well.

Suggestions for future researches:

- (i) 1. Doing similar research using other descriptive variables according to current literature about block trading premium.
- (ii) Analyzing premium of block trading in each industry separately
- (iii) Doing research by increasing time area and adjusting premium according to index changes to have a better ability to extend results.

- (iv) Analyzing non-linear relations on premium paid in block trading and factors analyzed in this research.

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