



Original Research Article

The intermediary institutions which are preferred for manipulative trading: Evidence from an emerging market

Received 23 June, 2017

Revised 2 July, 2017

Accepted 8 August, 2017

Published 14 September, 2017

**M. Mete Doganay*¹,
Ramazan Aktas²
and Kartal Somuncu³**

¹Department of Business Administration, Çankaya University, Eskişehir Yolu 29. Km. Ankara 06790, Turkey.

²Department of Business Administration, TOBB University of Economics and Technology, Söğütözü Caddesi No: 43, Ankara 06560, Turkey.

³Department of Business Administration, Afyon Kocatepe University, ANS Kampüsü, Afyon 03200, Turkey.

*Corresponding Author E-mail: mdoganay@cankaya.edu.tr
Tel: +90 312 233 1258

This research investigates the type of intermediary institutions chosen by the manipulators for their manipulative trading. Univariate and multivariate analyses are performed and three variables having significant effect on the manipulators' choice of intermediary institution for their manipulative trading are found. These variables are being publicly traded, size in terms of total assets, and gross profit margin. Being publicly traded and size are positively; gross profit margin is negatively related to the manipulators' choice of intermediary institution for their manipulative trading. Managers of the intermediary institutions and regulators should be aware of these results and regulators should scrutinize high volume transactions conducted through this type of intermediary institutions more closely.

Key words: Manipulation, intermediary institutions, investment, stock market, stock trading.

JEL Classification: G14, G15, G18, G24

INTRODUCTION

Stock-price manipulation is one of the most important issues in emerging capital markets. Manipulation can be defined as any action that distorts the price of securities. Fair price is very important for investors because they want to be sure that security prices are determined in the market by the common judgment of investors without any interference. In other words, market prices should reflect the demand and supply conditions. Manipulation prevents the formation of a fair price. Prices artificially inflated and deflated through manipulation cause investors to distance themselves from a specific market when they find that they are being taken advantage of by manipulators. Guiso et al. (2008) state and empirically prove that trusting the stock market is very important for the investors to decide whether to invest in a particular market or not. They define trust as "subjective probability individuals attribute to the possibility of being cheated". They also add "This subjective probability is partly based on objective characteristics of

the financial system ...". If the trust of the investors in a stock market fades away they become alienated from that market. As one of the main purposes of emerging markets is to attract as many investors as possible, alienation of investors due to manipulation prevents these markets from achieving this purpose. That is why manipulation is so harmful to emerging markets.

There are three main types of stock-price manipulation; namely, action-based manipulation, trade-based manipulation, and information-based manipulation. All types of manipulation have one single purpose: to influence the price of the targeted stock by interfering in market mechanism. In action-based manipulation, managers of the issuing company take actions such as closing a plant or not bidding in an auction to influence the price of the stock. Action-based manipulation is very rare today because of the regulations that restrict managers from taking short positions (main purpose of the action-based manipulation

is to deflate the price of the stock) in their companies' stock. In information-based manipulation, manipulators disseminate false information to influence the price of a stock. In trade-based manipulation, manipulators engage in fraudulent trading to deceive investors. The purpose of trade-based manipulation is to create an image of an active market and lure investors to take a position. Today, the most common type of manipulation is trade-based manipulation.

Stock-price manipulation has always drawn the attention of researchers. Beginning with the seminal paper of Allen and Gale (1992), many scholars have conducted research and published articles on stock-price manipulation. Some of these articles are mainly theoretical; they aim to show whether it is possible for the manipulators to gain advantage through fraudulent trading. Other articles involve empirical studies that attempt to find out an answer to the question as to whether manipulators have been successful in making gains at the expense of investors through manipulation. Within this context, some researchers have developed models to detect stock market manipulation. Also, there are published articles that investigate the characteristics of the stocks targeted for manipulation.

This paper looks at stock-price manipulation from a different perspective in an attempt to find out what type of intermediary institutions manipulators tend to choose for their manipulative trading. This is a very significant issue because all countries attach great importance to the governance of intermediary institutions, which is highly crucial for emerging markets to maintain investors' confidence. If the confidence of investors in a stock market has eroded, this market cannot be expected to attract foreign investors. It is also important for intermediary institutions to be aware of manipulators' practices and what type of intermediary institutions they prefer for manipulative trading. Intermediary institutions may not always distinguish manipulative trading from normal trading. If the managers of an intermediary institution know that the institution is susceptible to manipulative trading, they can devise more effective internal control methods to detect and prevent manipulative trading.

Manipulative trading and the intermediaries were first examined by Khwaja and Mian (2005). But this paper does not examine the role of intermediary institutions in manipulation. Intermediaries that the paper examines are brokers. Authors say that intermediaries (brokers) trade on their behalf or they execute the orders given by other investors. In the first situation they are principals whereas in the second situation they are agents. The paper presents empirical evidence that brokers engage in manipulative trading among themselves, which the authors name pump and dump scheme. This trading scheme increases the price of the targeted stock. Artificially increased prices attract outside investors who are positive feedback traders. Positive feedback traders buy the stocks from the brokers at artificially higher prices. When the brokers exit the market by selling the stocks to the positive feedback

traders, the prices fall sharply and outside investors suffer losses. Here manipulators are the brokers who trade on their own behalf. They used data compiled from Karachi Stock Exchange and empirical analyses that used this data showed that when brokers trade on their own behalf they earn higher rates than those earned by outside investors. İmişiker et al. (2015) performed a similar study using intraday trading history of stocks listed on Borsa Istanbul (formerly Istanbul Stock Exchange) and reached the similar conclusions as those of Khwaja and Mian.

This research is different from those studies. First of all, in those studies manipulators are the brokers who act as principals and trade on their own behalf. In this study manipulators are individuals who try to create an image of an active market by artificially increasing the price of the stocks through fraudulent trading. Since manipulators are not the members of the stock exchange, they have to trade through intermediary institutions, which are the members of the exchange. In other words, manipulators transmit their sell and buy orders to the intermediary institutions, which re-transmit them to the stock exchange to be executed. Intermediary institution is an investment bank or a brokerage firm. As explained above, the aim of this research is to identify the characteristics of the intermediary institutions chosen by the manipulators for their trading. Secondly, in other studies the suspected manipulative trades by developing assumptions were identified as mentioned above. Those are suspected trades and it is not certain whether they are manipulative or not. Since this sort of data are not available directly from the regulatory institutions in most of the countries, previous studies mostly relied on assumptions. But this research's sample consists of the manipulation cases that are identified and prosecuted by Capital Markets Board of Turkey, so there is a strong evidence that in these cases prices of the targeted stocks are manipulated.

Literature Review

Allen and Gale (1992) in their seminal paper classify manipulation as action-based manipulation, information-based manipulation, and trade-based manipulation and present a brief history of manipulation. In that paper they consider trade-based manipulation and say that in this type of manipulation manipulators buy and sell the stocks among themselves for the purpose of creating and image of an active market in order to lure uniformed investors to take position. The aim of the manipulators is to artificially inflate the prices, attract other investors to buy the stocks which causes a further increase in the prices and finally dump the stock in order to realize the profit. Jarrow (1992) is another pioneering researcher who studied market manipulation. He constructed a model to investigate whether large traders (traders whose trades can influence the market prices) could manipulate the security markets through different trading strategies in order to generate profit at no risk. Jarrow drew the attention of the readers to different trading strategies that could be employed by large

traders for manipulation. Following these pioneering papers, other researchers have published research studies dealing with different aspects of market manipulation.

Some of the researchers have investigated the possibility of manipulation in different security markets. For example Kumar and Seppi (1992) investigated the possibility of manipulation in futures markets by constructing a two-period theoretical model. They also tried to find out whether manipulation strategies such as corners and squeezes were useful for manipulation in futures markets. Saha and Petersen (2012) empirically investigated whether manipulation had actually occurred in futures markets by employing regression and correlation analyses. Other researchers investigated different aspects of manipulation in stock market through theoretical or empirical studies.

Gerard and Nanda (1993) developed a theoretical model to investigate whether it was possible to manipulate the prices in seasoned equity offerings. The model that they developed aimed to predict whether the manipulators attempted to lower the price of the stocks by selling heavily prior to the offering in order to take the advantage of lower prices in the offering.

Felixson and Pelli (1999) examined empirically if closing prices were manipulated. Felixson and Pelli's study is one of the earlier empirical works related to manipulation. Manipulators try to influence the closing prices by heavily buying or selling the targeted stocks at the end of the trading day. Closing prices are very important because they are used as benchmarks in many instances. For this reason other researchers have also been interested in closing price manipulation and conducted research on this topic. Hillion and Suominen (2004) developed an agency-based model to examine closing price manipulation. In agency-based model the manipulator is the broker and the aim of the manipulator is to influence his/her customer's perception of his/her performance. Comerton-Forde and Putnins (2011) examined closing price manipulation by using United States and Canadian data that included prosecuted closing price manipulation cases. Kadioğlu et al. (2015) tested the effect of closing call auction sessions on closing price manipulation in Istanbul Stock Exchange. Analyses showed that the introduction of closing call auction sessions significantly eliminated the closing price manipulation.

Van Bommel (2003) studied information-based manipulation, which is another type of stock-price manipulation, by developing a model. Chakraborty and Yılmaz (2004) developed a model that explained how informed insiders could manipulate the stock-prices by adopting certain trading behavior. Although not directly related to manipulation Jouini and Napp (2015) examined the impact of gurus' beliefs on investment decisions, prices, and risk premium through a model that they developed. In other words, they examined at what extent the information received from the gurus could influence these factors.

Aggarwal and Wu (2006) developed a theory related to trade-based manipulation and tested the theory by using data compiled from SEC enforcement actions. Aggarwal and

Wu obtained sufficient evidence indicating that due to manipulative trading price, volume and volatility of the targeted stocks increased during the manipulation period.

Manipulation has also been examined in emerging markets. Aktaş and Doğanay (2006) applied Aggarwal and Wu's methodology with minor modifications to examine trade-based manipulation and the success of the manipulators in Istanbul Stock Exchange. They constructed a data set from prosecuted manipulation cases for the empirical analysis. They found that the manipulators could obtain profit at the expense of other traders through trade-based manipulation. Su (2011) states that momentum profits in Chinese stock markets may be due to market manipulation. Azad et al. (2014) investigated the trade-based manipulation and its effect on market efficiency in South Asian stock markets. İmişiker and Tas (2013) investigated the characteristics of the firms whose stocks had been manipulated. As indicated in the previous section, Khwaja and Mian (2003) and İmişiker et al. (2015) investigated the role of the brokers in trade-based manipulation in Karachi Stock Exchange and Borsa Istanbul respectively.

There are also research papers in literature that developed models to predict and detect stock-price manipulation. The models involved classical multivariate statistical methods such as discriminant analysis and logistics regression as well as fuzzy, neurofuzzy, and data mining techniques. One of the earlier researches was conducted by Palshikar and Bahulkar (2000) on this topic. They used fuzzy methods in order to identify the trading pattern of the manipulators.

Huang and Cheng (2015) examined the characteristics and patterns of manipulated stocks by using a data set compiled in Taiwan stock markets.

As can be seen from the literature review different researchers have investigated different aspects of manipulation. In this research, it is attempted to investigate the type of intermediary institutions that individual manipulators choose for their manipulative trading. This study will fill this research gap and make a modest contribution to the literature.

Institutional Setting

Investment banking and brokerage activities in Turkey are carried out by the intermediary institutions. Capital Markets Board of Turkey (CMBT) defines intermediary institution as "an investment firm authorized by the Board to deal exclusively with the investment services and activities". These investment services and activities may be brokerage activities (reception, transmission, and execution of customers' buy and sell orders), dealer activities (buying and selling the securities on its own account), underwriting, and intermediation in a security offering without underwriting. As stated before individuals and institutions (other than the intermediary institutions) can buy and sell the securities through an intermediary institution.

Intermediary institutions can be classified according to their certain characteristics. One type of classification is based on the activities. Some intermediary institutions only perform brokerage activities, some intermediary institutions act both as a broker and dealer, some intermediary institutions do not underwrite, and some intermediary institutions perform all the activities and provide all the services.

Another classification is based on the ownership structure. Some intermediary institutions are the subsidiaries of the banks. They act as the investment banking division of the owner banks. Some other intermediary institutions are the subsidiaries of holding companies. Some intermediary institutions are publicly held whose shares are traded in Borsa Istanbul. Some other intermediary institutions have foreign ownership.

MATERIALS AND METHODS

Data

The weekly bulletins published by the Capital Markets Board of Turkey were examined. When the Capital Markets Board of Turkey is informed by Borsa Istanbul about a suspected trade-based manipulation it conducts an investigation. If the Board finds sufficient evidence indicating a trade-based manipulation as a result of the investigation, it files a charge to the office of the public prosecutor and publishes the case in the weekly bulletin. 37 trade-based manipulation cases were identified in the bulletins between February 2013 and October 2015. Capital Markets Board of Turkey permitted the publication of trades (purchases and sales) conducted by intermediary institutions for each stock beginning from February 2013. That is why data starting from February 2013 were included in this study.

For each manipulated stock, Capital Markets Board gives a manipulation period in which the actual manipulation through fraudulent trading occurred and the names of the alleged manipulators. Daily trading volume data for each manipulated stock during the manipulation period, based on the concerning intermediary institution were collected. In other words, daily data related to the trading volume of each manipulated stock through each intermediary institution were compiled. The data were collected from the data terminals of Matriks and Finnet.

Trading Volume = (Number of shares purchased * purchase price) + (Number of shares sold * sales price)

As can be seen from the above expression trading volume has two components, which are quantity and price. Trading volume is important because in trade-based manipulation, as its name indicates, manipulators engage in fraudulent trading to create an image of an active market. Fraudulent trading increases the trading volume of the manipulated stock because manipulators buy and sell among themselves and in each transaction they increase the quantity and price so as to make other investors believe that there are

fundamental reasons behind these quantity and price movements. Manipulators' main aim is to send a false signal to the market through increased volume and make other investors to buy the stock at an artificially inflated price, so the trading volume is the key indicator of trade-based manipulation.

Complete data set includes the daily trading volume of manipulated stocks during the respective manipulation period for each intermediary institution. Then, the daily trading volume percentage of each manipulated stock during the respective manipulation period for each intermediary institution was calculated. In other words, what percentage of trading volume belongs to which intermediary institution was determined. Afterwards, the mean of the trading volume percentage of each manipulated stock for each intermediary institution for the respective manipulation period was calculated. Data set can be tabulated as shown in Table 1.

In the Table above intermediary institutions are denoted by the letters, manipulated stocks are denoted by the numbers. Cell 1 A contains mean of the trading volume percentage of stock 1 for intermediary institution A for the period in which stock 1 is manipulated. The last row contains the averages of the mean trading volume percentages for each intermediary institution for the respective manipulation periods.

As stated before this paper aims to investigate the type of intermediary institutions that individual manipulators choose for their manipulative trading. Certain attributes of the intermediary institutions were used as variables in order to achieve this purpose. One type included grouping variables. Such variables were used in order to group the intermediary institutions. Then, the group of intermediary institutions preferred by the investors for manipulative trading was examined. Another type includes numerical variables. The effect of these variables on manipulators' choice of intermediary institutions for manipulative trading was investigated.

One grouping variable categorizes the intermediary institutions in terms of whether they are the subsidiaries of the banks or not. Banks have strong internal control procedures and they have risk monitoring departments. For this reason, it is expected that banks will influence their subsidiaries operating as intermediary institutions to establish strong internal control procedures. Strong internal control procedures provide greater chance of detecting fraudulent trading.

Another grouping variable categorizes the intermediary institutions in terms of whether they are the subsidiaries of the holding companies or not. Holding companies manage a portfolio of companies operating in similar or different sectors. Holding companies devise control mechanisms to supervise their subsidiaries. It is expected that these control mechanisms will affect their subsidiaries operating as intermediary institutions and will also establish more effective mechanisms to detect manipulative trading.

Some intermediary institutions are publicly held corporations while others are privately held. The

Table 1. Data Set

Manipulated Stock ↓	Intermediary Institutions →	A	B	C	Z
1							
2							
3							
....							
....							
37							
Average							

intermediary institutions were also grouped according to this characteristic. Publicly held corporations have many investors and their stocks are traded in an exchange. That is why they have dispersed ownership. Intermediary institutions that are publicly held may not put enough emphasis on detection of manipulating trading because ownership and management are separate entities and their interests may differ.

The intermediary institutions are also categorized according to their ownership structure. Some intermediary institutions have foreign ownership. In other words, more than 50 % of the voting stocks of some intermediary institutions are held by foreign investors. These intermediary institutions are mostly the subsidiaries of the global companies. These global companies are expected to be highly institutionalised and have effective control measures to supervise their worldwide subsidiaries. These control measures may urge their subsidiaries, which operate as intermediary institutions, to design more effective internal control procedures to detect manipulative trading.

The intermediary institutions are also categorized according to their trading volume percentage. Trading volume percentage stands for the share of a particular intermediary institution in the total trading volume. It is expected that intermediary institutions, which have low trading volume percentage, may overlook manipulative trading in order to increase their trading volume. Three groups are formed based on the trading volume percentage. The first group comprises the intermediary institutions to which 80 % of the trading volume belongs, the second group comprises the intermediary institutions to which 15 % of the trading volume belongs, and the third group comprises the intermediary institutions to which 5 % of the trading volume belongs. This is a sort of Pareto classification.

Size, revenue and profitability ratios are used as numerical variables. Size is represented by the total assets of a particular intermediary institution. Small intermediary institutions (intermediary institutions that have less assets and revenue) may be more likely to be chosen by the manipulators because they may be less institutionalised and may be reluctant to employ sufficient number of skilled employees specialized in risk management in order to minimize costs. Since intermediary institutions charge a

commission for their brokerage activities and the trading volume of the manipulators are high, small intermediary institutions may overlook manipulative trading in order to increase their revenues. The same reasoning also applies to profitability ratios. Intermediary institutions that have low profitability ratios may be more prone to overlook manipulative trading for the purpose of increasing their profitability. Gross profit margin, operating profit margin, net profit margin and return on assets are used as numerical variables.

It is also investigated whether an intermediary institution's growth rates (growth of assets and revenue) and the level of leverage are related to the manipulative trading conducted through that particular intermediary institution. Growth rates and leverage ratios are used as numerical variables for this purpose. It is reasoned why intermediary institutions that want to grow rapidly may ignore manipulative trading or may be reluctant to take stringent control measures to detect fraudulent trading. Highly leveraged intermediary institutions may ignore manipulative trading in order to increase their cash position in order to enable them to service debt more easily.

Two other ratios are also used as numerical variables. These ratios are the percentage of brokerage fees to total revenues and brokerage fees from stock transactions to total brokerage fees. Intermediary institutions whose revenue comes mainly from brokerage fees and especially from brokerage fees from stock transactions are not likely to overlook manipulative trading because they earn sufficient revenue from brokerage activities.

All the data related to the intermediary institutions are gathered from the Turkish Capital Markets Association whose members are the capital market institutions including intermediary institutions. Values of the numerical variables are the average of 2012-2013-2014 values for each intermediary institution.

Analysis

Firstly, the expectations concerning the grouping variables are tested. As stated above, grouping variables are used to categorize intermediary institutions based on certain characteristics. Hypothesis testing (t-test) or one-way analysis of variance is performed to see whether there is a

significant difference between group means (average of the mean trading volume percentages of the manipulated stocks). As explained before, intermediary institutions are grouped based on whether they are the subsidiaries of the banks or not, whether they are the subsidiaries of the holding companies or not, whether their majority stocks are owned by foreigners or not, and whether they are publicly held or not. As can be seen there are two groups in each case and hypothesis testing (t-test) is performed for each case to see whether there is a significant difference between group means. Intermediary institutions are also grouped according to their trading volume percentages. Three groups are formed according to this grouping variable and one-way analysis of variance is performed to see whether there is a significant difference in group means.

Firstly, it is aimed to find out if there is a significant difference between intermediary institutions operating as subsidiaries of banks and that do not, in terms of the average of the mean trading volume percentages of the manipulated stocks. Levene's test is performed to test the null hypothesis (H_0) that group variances are equal against the alternative hypothesis (H_1) that group variances are not equal. Test statistics is 4.073 and it is significant at 5 % level. Accordingly, H_0 is rejected at this level of significance. For this reason, t-test is performed by assuming unequal variances and the null hypothesis (H_0) that group means are equal is rejected at 10 % significance level (sig. 2-tailed =0.071). Mean of the intermediary institutions that operate as the subsidiaries of the banks is higher. This finding indicates that manipulators generally perform their manipulative trading through this type of intermediary institutions.

The same procedure is also performed for other binary groupings. Levene's test accepted the null hypothesis (H_0) that group variances are equal when the test is performed for the grouping based on the association with holding companies (test statistics is 0.422 and not significant at 10 % level). Accordingly, t-test is performed by assuming equal variances and the null hypothesis (H_0) that group means are equal is accepted (sig. 2-tailed =0.479). This finding indicates that intermediary institutions' association with holding companies does not affect manipulative trading.

Levene's test rejected the null hypothesis (H_0) that group variances are equal when the test is performed for the grouping based on whether the intermediary institution is publicly traded or not (test statistics is 48.104 and significant at 1 % level). Accordingly, t-test is performed by assuming unequal variances and the null hypothesis (H_0) that group means are equal is accepted (sig. 2-tailed =0.125). This finding indicates that there is no difference between publicly traded intermediary institutions and privately held intermediary institutions in terms of manipulative trading. In other words, it is not important for the manipulators whether the intermediary institution through which they perform manipulative trading is publicly or privately held.

Levene's test accepted the null hypothesis (H_0) that group variances are equal when the test is performed for the grouping based on whether the majority of the shares of the intermediary institution belong to foreign investors or local investors (test statistics is 0.267 and not significant at 10 % level). Accordingly, t-test is performed by assuming equal variances and the null hypothesis (H_0) that group means are equal is accepted (sig. 2-tailed =0.707). This finding indicates that ownership structure (foreign or local) of an intermediary institution does not affect the manipulative trading that is performed through that intermediary institution.

As stated above, three groups are formed according to the grouping variable of trading volume percentage and one-way analysis of variance is performed to see whether there is a significant difference in group means. Results of the analysis are presented in Table 2 and Table 3.

As can be seen from Table 2 there is a significant difference between group means. Bonferroni test is performed to identify which means significantly differ from each other. Results of the Bonferroni test are presented in Table 3. Bonferroni test shows that the means of group 1 and group 3, and the means of group 2 and group 3 significantly differ from each other.

Those analyses mentioned above are univariate analyses because the effect of one grouping variable on manipulative trading is investigated in each analysis.

Expectations concerning the numerical variables are tested. The effect of these variables on manipulators' choice of intermediary institutions for manipulative trading is investigated by using correlation analysis. The results of this analysis are given in Appendix A.

As can be seen from Appendix A, there is a significant positive relation between average of the mean trading volume percentages and size. Average of the mean trading volume percentages is dependent variable and it is the main indicator of manipulative trading conducted through a specific intermediary institution. It is expected that bigger intermediary institutions are not preferred by the manipulators for their manipulative trading because they are institutionalised and they may have effective control measures to detect manipulation. But the result of the correlation analysis is contrary to our expectation.

There is also a significant positive relation between average of the mean trading volume percentages and revenue. Revenue is highly and positively correlated with size. Bigger intermediary institutions in terms of assets have also higher revenue.

There is a significant negative relation between average of the mean trading volume percentages and the percentage of the brokerage fees to total revenue ratio. As the percentage of the brokerage fees to total revenue ratio increases the probability of being chosen by the manipulators for their manipulative trading decreases. This result conforms to our expectation.

There is a significant negative relation between average of the mean trading volume percentages and leverage. As the leverage decreases the probability of being chosen by

Table 2. Results of the analysis of variance

ANOVA					
Average of the mean trading volume percentages of the manipulated stocks					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	42.516	2	21.258	7.283	.001
Within Groups	245.167	84	2.919		
Total	287.682	86			

Table 3. Results of the Bonferroni test

Multiple Comparisons						
Dependent Variable: Average of the mean trading volume percentages of the manipulated stocks Bonferroni						
(I) PARETO	(J) PARETO	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
1	2	.3043519	.8053503	1.000	-1.663012	2.271716
	3	1.8694264*	.6054699	.008	.390344	3.348509
2	1	-.3043519	.8053503	1.000	-2.271716	1.663012
	3	1.5650745*	.6054699	.034	.085992	3.044157
3	1	-1.8694264*	.6054699	.008	-3.348509	-.390344
	2	-1.5650745*	.6054699	.034	-3.044157	-.085992

*. The mean difference is significant at the 0.05 level.

the manipulators for their manipulative trading increases. This result is contrary to our expectation. But this variable is found to be insignificant in the multiple regression analysis that will be explained below.

There is a significant negative relation between average of the mean trading volume percentages and gross profit margin. As the gross profit margin decreases the probability of being chosen by the manipulators for their manipulative trading increases. This result conforms to our expectation.

There is no significant relation between average of the mean trading volume percentages and other numerical variables.

The combined effect of all variables (grouping variables and numerical variables) on manipulative trading is also investigated by performing multiple regression analysis, which is a multivariate method. Estimated cross-sectional regression model is presented below:

$$Avr_i = \beta_0 + \beta_1 Bnksub_i + \beta_2 Holdsub_i + \beta_3 Pubtrd_i + \beta_4 Ownstr_i + \beta_5 Prt_i + \beta_6 Logsize_i + \beta_7 Growratesize_i + \beta_8 Logrev_i + \beta_9 Growraterev_i + \beta_{10} Prcbrk_i + \beta_{11} Prcbrkst_i + \beta_{12} Lvr_i + \beta_{13} Grsprmr_i + \beta_{14} Oprsprmr_i + \beta_{15} Netprmr_i + \beta_{16} Rtrassets_i + \varepsilon_i$$

Here, Avr_i is the average of the mean trading volume percentages for i^{th} intermediary institution for the respective manipulation periods; $Bnksub_i$ is a dummy variable that takes the value of 1 if the intermediary institution is a bank subsidiary, 0 otherwise; $Holdsub_i$ is a dummy variable that takes the value of 1 if the intermediary institution is a holding subsidiary, 0 otherwise; $Pubtrd_i$ is a dummy variable that takes the value of 1 if the intermediary institution is publicly traded, 0 otherwise; $Ownstr_i$ is a dummy variable that takes the value

of 1 if the majority of the shares of the intermediary institution belong to local investors, 0 otherwise. Prt_i takes the value of 1 if the intermediary institution is included in the first group, 2 if the intermediary institution is included in the second group, 3 if the intermediary institution is included in the third group. Grouping is based on the trading volume percentage. $Logsize_i$ is the logarithm of the total assets of the i^{th} intermediary institution; $Growratesize_i$ is the asset growth rate of the i^{th} intermediary institution; $Logrev_i$ is the logarithm of the revenue of the i^{th} intermediary institution; $Growraterev_i$ is the revenue growth rate of the i^{th} intermediary institution; $Prcbrk_i$ is the brokerage fees to total revenue ratio for the i^{th} intermediary institution; $Prcbrkst_i$ is the brokerage fees from stock transactions to total brokerage fees for the i^{th} intermediary institution; Lvr_i is the leverage ratio of the i^{th} intermediary institution; $Grsprmr_i$ is the gross profit margin of the i^{th} intermediary institution; $Oprsprmr_i$ is the operating profit margin of the i^{th} intermediary institution; $Netprmr_i$ is the net profit margin of the i^{th} intermediary institution; $Rtrassets_i$ is the return on assets of the i^{th} intermediary institution.

Correlation analysis shows that there is a significant relation between some numerical variables, which indicates multicollinearity problem. Stepwise method is used to overcome this problem. R^2 of the estimated model is 0.506, which is quite reasonable. Results of the multiple regression analysis are presented in Table 4.

As can be seen from Table 4 there are three significant (at 5 % level) variables in the final model, which are size, being publicly traded, and gross profit margin.

It is investigated why the variables found to be significant in the univariate analysis are eliminated by stepwise

Table 4. Results of the multiple regression analysis

Coefficients^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-10.559	1.863		-5.668	.000
	Logsize	1.555	.246	.566	6.327	.000
2	(Constant)	-8.201	1.704		-4.814	.000
	Logsize	1.221	.226	.444	5.400	.000
	Pubtrd	3.628	.714	.418	5.080	.000
3	(Constant)	-7.239	1.734		-4.175	.000
	Logsize	1.132	.226	.412	5.009	.000
	Pubtrd	3.476	.704	.400	4.937	.000
	Grspmr	-.814	.392	-.166	-2.079	.041

a. Dependent Variable: Average of the mean trading volume percentages

method. Hypothesis testing (t-test) is performed to find out whether there is a significant difference between the sizes of the intermediary institutions that are bank subsidiaries and that are not bank subsidiaries. Levene's test accepted the null hypothesis (Ho) that group variances are equal (test statistics is 0.385 and not significant at 10 % level). Accordingly, t-test is performed by assuming equal variances and the null hypothesis (Ho) that group means are equal is rejected (sig. 2-tailed =0.000). This result indicates that the size of the intermediary institutions that are bank subsidiaries and that are not bank subsidiaries differ significantly. Intermediary institutions operating as the subsidiaries of the banks have also a bigger size. Since there is a relation between size and being a bank subsidiary when size enters as a significant variable being a bank subsidiary, found to be significant in univariate analysis, is eliminated. Another significant variable in univariate analysis is trading volume percentage (Prt). This variable is also eliminated in multiple regression analysis. One-way analysis of variance is performed in order to see if there is a relationship between trading volume percentage and size. Analysis rejected the null hypothesis that groups have the same size. Intermediary institutions to which higher percentage of trading volume belongs have also a bigger size. As in the case of being a bank subsidiary, when size enters as a significant variable trading volume percentage, which has a relation with size, is eliminated.

There is another interesting finding. Being publicly traded or not is found to be insignificant in univariate analysis. But it is a significant variable in multiple regression analysis. An insignificant variable in univariate analysis may turn out to be a significant variable in multivariate analysis.

When the signs of the coefficients in Table 3 are examined, it is seen that size and being publicly traded positively and gross profit margin negatively affect manipulative trading. These results indicate that manipulators generally conduct manipulative trading through the intermediary institutions that are publicly traded, that have bigger size in terms of assets, and that

have lower gross profit margin. It is expected that; intermediary institutions that have lower profitability ratios will be more prone to manipulative trading. It is also expected that; intermediary institutions that are publicly held may not put enough emphasis on detection of manipulating trading due to the reason stated in section 4. Results of the multiple regression analysis conform these expectations. On the other hand, it is expected that manipulators do not prefer bigger intermediary institutions, but the results of the multiple regression analysis reveal the opposite. The results will be discussed in the next section.

RESULT AND CONCLUSIONS

Results of the analyses performed in this study show that manipulators prefer intermediary institutions that are publicly traded, that are bigger in terms of total assets, and that have lower gross profit margin. It was also found that bigger intermediary institutions are mostly the subsidiaries of the banks that operate as investment banking divisions of the owner banks, and their trading volume percentages and revenues are also higher.

Publicly traded intermediary institutions are more susceptible to be chosen by the manipulators for their manipulative trading because their management and ownership are separate entities. Managers of this type of intermediary institutions may overlook manipulative trading because manipulative trading involves higher volume of transactions and boost brokerage fees. Higher brokerage fees mean higher revenue and higher revenue brings about higher dividends and higher stock price. Higher revenue is also considered as the success of the managers in the eyes of the stockholders. For these reasons managers of the publicly traded intermediary institutions may not put sufficient emphasis on detecting manipulative trading conducted by the manipulators through their firms.

Bigger intermediary institutions are expected to be not preferred by the manipulators for their manipulative

trading as they are more institutionalised and they are also more capable of taking necessary measures to detect manipulative trading. However, the results of the analyses do not conform to this expectation. Results show that manipulators generally choose bigger intermediary institutions for their manipulative trading. There may be several reasons for this. Since bigger intermediary institutions have also higher trading volume control may become harder for them and they may not detect manipulative trading. This type of intermediary institutions may not employ sufficient number of skilled employees to detect manipulation. Manipulators may think that they are unnoticed among many transactions and they may prefer bigger intermediary institutions to hide themselves. Managers of the bigger intermediary institutions may think that their institutions are too big to fail and may tend to overlook manipulative trading.

Intermediary institutions whose gross profit margins are lower may tolerate manipulative trading to improve their margins because manipulative trading involve high trading volume and, in turn, higher revenue. This type of intermediary institutions may be reluctant to employ skilled employees to detect manipulation in order to control the operating expenses.

These results have policy implications for both intermediary institutions and regulators. Especially the managers of the bigger intermediary institutions should be aware of their institutions vulnerability to manipulative trading. For this reason they should device more effective control measures to detect manipulative trading as one of their responsibilities is to report suspicious transactions to the Capital Markets Board of Turkey.

As for regulators, they should examine high volume transactions conducted through publicly held intermediary institutions, bigger intermediary institutions, and intermediary institutions that have low gross profit margin. It is of utmost importance for the regulators to deter manipulative trading because manipulation is one of the main reasons that alienate investors from a specific stock market.

Intermediary institutions play a very important role in detecting and preventing trade-based manipulation because all transactions must go through them. This type of study should also be conducted in other emerging markets. The most important limitation of this sort of study is accessing to necessary data. Turkish data could be accessed and the study using these data was conducted. Other researchers may be able to access to their countries' data and conduct the study by using those data. However, this study is also expected to raise the awareness of emerging market intermediary institutions and regulators.

Conflict of Interests

The authors declare that there is no conflict of interests regarding the publication of the paper.

REFERENCES

- Aggarwal RK, Wu G (2006). Stock market manipulations. *J. Business*. 79: 1915–1953.
- Aktaş R, Doğanay M (2006). Stock-Price Manipulation in the İstanbul Stock Exchange. *Eurasian Review of Economics and Finance*. 2: 21-28.
- Allen F, Gale D (1992). Stock-price manipulation. *Review of Financial Studies*. 5: 503–529.
- Azad AS, Azmad S, Fang V, Edirisuriya P (2014). Unchecked manipulations, price-volume relationship and market efficiency: Evidence from emerging markets. *Res. Int. Bus. Finac*. 30: 51-71.
- Chakraborty A, Yılmaz B (2004). Informed manipulation. *J.Econ. Theory*. 114: 132–152.
- Comerton-Forde C, Putnins TJ (2011). Measuring closing price manipulation. *J. Financial Intermediation*. 20: 135-158.
- Felixson K, Pelli A (1999). Day end returns-stock manipulation. *J. Multinational Financial Manag*. 9: 95–127.
- Gerard B, Handa V (1993). Trading and manipulation around seasoned equity offerings. *J. Finance*. 48: 213–245.
- Guiso L, Sapienza P, Zingales L (2008). Trusting the Stock Market. *J. Finance*. 63: 2557-2600.
- Hillion P, Suominen M (2004). The manipulation of closing prices. *J. Financial Markets*. 7: 351-375.
- Huang CY, Cheng YJ (2015). Stock manipulation and its effects: pump and dumb versus stabilization. *Review of Quantitative Finance and Accounting*. 44: 791-815.
- İmişiker S, Onur Taş BK (2013). Which firms are more prone to stock market manipulation? *Emerging Markets Review*. 16: 119-130.
- İmişiker S, Özcan R and Onur Taş BK (2015). Price Manipulation by Intermediaries. *Emerging Markets Finance and Trade*. 51: 788-797.
- Jarrow RA (1992). Market manipulation, bubble, corners, and short squeezes. *J. Financial and Quantitative Analysis*. 27: 311–336.
- Jouini E, Napp C (2015). Gurus and belief manipulation. *Economic Modelling*. 49: 11-18.
- Kadıoğlu E, Küçükkoçaoğlu G, Kılıç S (2015). Closing price manipulation in Borsa İstanbul and the impact of call auction sessions. *Borsa İstanbul Review*. 15: 213-221.
- Khwaja AI, Mian A (2005). Unchecked intermediaries: Price manipulation in an emerging stock market. *J. Financial Economics*. 78: 203-241.
- Kumar P, Seppi DJ (1992). Futures manipulation with cash settlement. *J. Finance*. 47: 1485–1502.
- Palshikar GK, Bahulkar A (2000). Fuzzy temporal patterns for analysing stock market databases. In *Proceedings of the international conference on advances in data management* (pp. 135–142). Pune, India: Tata-McGraw Hill.
- Saha A, Petersen H (2012). Detecting price artificiality and manipulation in futures markets: An application to Amaranth. *J. Derivatives & Hedge Funds*. 18: 254-271.

Su D (2011). An Empirical Analysis of Industry Momentum in Chinese Stock Markets. *Emerging Markets Finance and Trade*. 47 (4): 4-27.

Van Bommel J (2003). Rumors. *J. Finance*. 58: 1499-1519.

Appendix A

Correlations													
		Log Size	Asset Growth Rate	Log Revenue	Revenue Growth Rate	Brokerage fees /Revenue	Stc.Brk. Fees/Total Brk. Fees	Leverage Ratio	Gross Profit Margin	Operating Profit Margin	Net Profit Margin	Return on Assets	Average***
Log Size	Pearson Correlation	1	.152	.650**	-.129	-.239*	-.026	-.476**	-.227*	.243*	.252*	.439**	.566**
	Sig. (2-tailed)		.160	.000	.233	.026	.814	.000	.034	.024	.019	.000	.000
Asset Growth Rate	Pearson Correlation	.152	1	-.157	-.007	.262*	-.237*	-.069	.216*	-.337**	-.336**	.051	.023
	Sig. (2-tailed)	.160		.147	.949	.014	.027	.526	.045	.001	.001	.641	.831
Log Revenue	Pearson Correlation	.650**	-.157	1	.000	-.625**	.112	-.363**	-.698**	.453**	.412**	.205	.437**
	Sig. (2-tailed)	.000	.147		.997	.000	.302	.001	.000	.000	.000	.056	.000
Revenue Growth Rate	Pearson Correlation	-.129	-.007	.000	1	-.013	-.081	.102	.014	-.103	-.100	-.043	.008
	Sig. (2-tailed)	.233	.949	.997		.905	.454	.349	.901	.340	.355	.693	.942
Brokerage fees/Revenue	Pearson Correlation	-.239*	.262*	-.625**	-.013	1	.116	.104	.694**	-.314**	-.352**	-.049	-.238*
	Sig. (2-tailed)	.026	.014	.000	.905		.284	.337	.000	.003	.001	.651	.026
Brokerage fees from stock transactions/Total Brokerage fees	Pearson Correlation	-.026	-.237*	.112	-.081	.116	1	-.087	-.293**	.029	.096	.021	.111
	Sig. (2-tailed)	.814	.027	.302	.454	.284		.423	.006	.792	.376	.845	.306
Leverage Ratio	Pearson Correlation	-.476**	-.069	-.363**	.102	.104	-.087	1	.236*	-.205	-.128	-.040	-.381**
	Sig. (2-tailed)	.000	.526	.001	.349	.337	.423		.028	.056	.237	.713	.000
Gross Profit Margin	Pearson Correlation	-.227*	.216*	-.698**	.014	.694**	-.293**	.236*	1	-.237*	-.279**	.066	-.324**
	Sig. (2-tailed)	.034	.045	.000	.901	.000	.006	.028		.027	.009	.547	.002
Operating Profit Margin	Pearson Correlation	.243*	-.337**	.453**	-.103	-.314**	.029	-.205	-.237*	1	.906**	.294**	.151
	Sig. (2-tailed)	.024	.001	.000	.340	.003	.792	.056	.027		.000	.006	.164
Net Profit Margin	Pearson Correlation	.252*	-.336**	.412**	-.100	-.352**	.096	-.128	-.279**	.906**	1	.444**	.133
	Sig. (2-tailed)	.019	.001	.000	.355	.001	.376	.237	.009	.000		.000	.219
Return on Assets	Pearson Correlation	.439**	.051	.205	-.043	-.049	.021	-.040	.066	.294**	.444**	1	.114
	Sig. (2-tailed)	.000	.641	.056	.693	.651	.845	.713	.547	.006	.000		.293
Average***	Pearson Correlation	.566**	.023	.437**	.008	-.238*	.111	-.381**	-.324**	.151	.133	.114	1
	Sig. (2-tailed)	.000	.831	.000	.942	.026	.306	.000	.002	.164	.219	.293	

** . Correlation is significant at the 0.01 level (2-tailed).
* . Correlation is significant at the 0.05 level (2-tailed).
*** Average of the mean trading volume percentages