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CAPITAL MARKET REVIEW

Price Manipulation in Indonesian Capital Market: Empirical Analysis on Stockbroker's Behavior and Interaction Pattern between Domestic Investors and Foreign Investors

Buddi Wibowo*

Price manipulation in stock market transaction is an important issue when developing investor confidence and market integrity is a priority. Price manipulation is prevalent in emerging markets, which still have institutional problems and lack regulations. A stock market as a mutual company has an institutional problem when a stock broker instead of being an intermediary, behaves like a dealer and a principal for some stocks. A stock broker has strong incentives to give a signal to public investors about price of some stocks in order to get an unfair profit. A usual pattern of manipulation done by stock broker is a pump and dump manipulation. Artificial price increase was made by manipulators through buying and selling activities among themselves until trend chaser and naive investors jump to this game. When stock price is at the highest level, manipulators start selling their stock. This research measured and identified behavior pattern of stock brokers in Indonesian Stock Market, concerning their contribution to price manipulation existence. Because of the important role played by foreign investors in Indonesian stock market, this research would also identify interaction pattern between foreign and domestic investors. Empirical researches showed that foreign investors were underperformed domestic investors in Indonesian stock market (Dvorak, 2005, and Agarwal et al. 2009). In spite of their superior experience and financial support compared to domestic investors, foreign investors got lower return on average. Agarwal et al. (2009) showed this phenomenon occurred because foreign investors were more aggressive than domestic investors. Dvorak (2005) argued that domestic investors had more access and network to collect short run information and were able to transfer those information to profitable trading strategy. This research tested new hypothesis about foreign investors' underperformance, that those foreign investors were entrapped in manipulative mechanism done by domestic investors having short run information through domestic stockbroker companies.

Keywords: broker's behavior, price manipulation, behavioral finance

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Introduction

Stock market manipulation is a kind of deception through developing an artificial stock price. This manipulative action is usually done by some investors and brokers who make artificial transactions among themselves in order to increase stock price. Naive investors who are attracted by this increasing trend of the stock price will follow this trend and make price increase further. These naive investors will enter the market until the price becomes so high that the manipulators start selling the stocks. Profit taking activities make the price decrease until it reaches its real value. This manipulative action is called as *pump and dump mechanism* (Allen dan Gale, 1992).

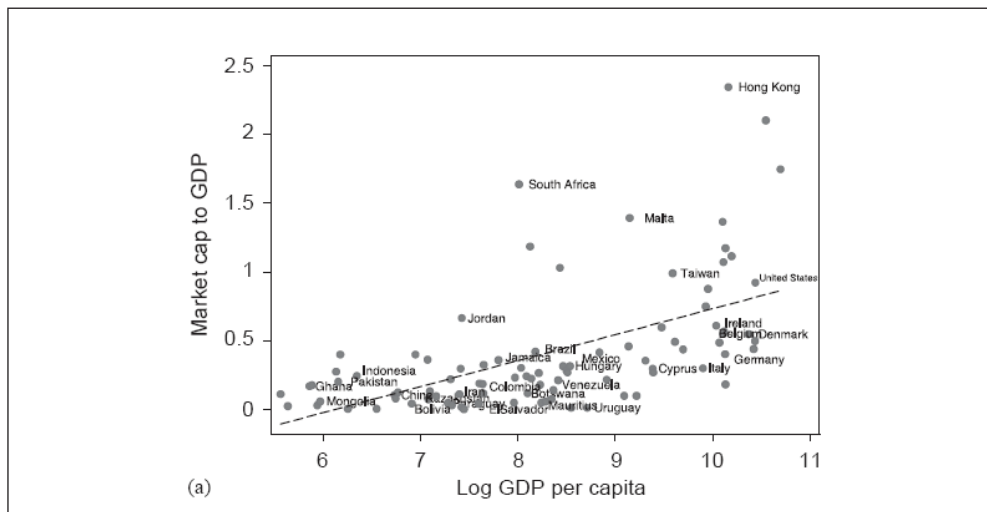
This market price manipulation usually occurs at stock markets in developing countries, which are not yet backed by strong supervising institutions, systems, and regulations. Zhou and Mei (2003) and Khanna and Sunder (1999) found sources of manipulative stock transaction in China dan India were weaknesses of the supervising institutions and market regulations.

Low market integrity has an implication on public motivation to invest in capital market. Market capitalization in developing countries is relatively low compared to their GDP. The number of public companies is low and only few companies go public every year. For example Indonesia's ratio stock market capitalization to GDP is around 48%, far below the ratios of Singapore and Australia, which is 334% and 140% of their GDP respectively. Figure 1 shows market capitalization per capita for some countries.

Institutional weakness in developing countries is not surprising because most of them have operated not very long. Institutional building and market regulation is a phase that developed countries, like USA, have experienced before (Gordon, 2000). Manipulative practices, that had destructed market integrity and investor confidence, forced *US Securities Act* in 1934, that was specially aimed at eliminating those practices.

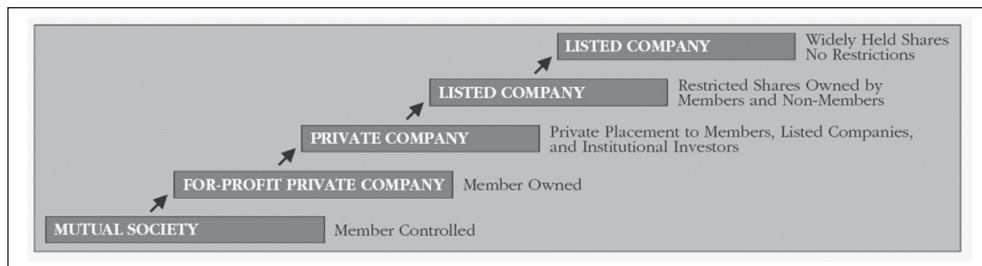
Khwaja dan Mian (2006) found that manipulative action through pump and dump mechanism mostly were done and

Figure 1. Global Stock Market Role



Source: Khwaja dan Mian (2006)

Figure 2. Stock Market Demutualization Stages



Source: Aggarwal (2002)

backed up by stock brokers. Instead of being an intermediary, they became a principal of some stocks and influenced those stock price formation processes for their own interest.

In Indonesian capital market, like in most emerging markets, stock brokers' role in price formation process tends to be significant because of weak market structure and regulation. Most emerging capital markets run as a mutual company so that those markets were found to be owned by pool of stock brokers. It is predominantly broker-managed, i.e., a majority of the exchange's board of directors, including the chairman, is brokers. Moreover, trading on the stock exchange can be done only through licensed brokers.

A stock broker has a conflict of interest as a market player and also as an owner. Indonesian Capital Market Act 1998 stated that Indonesian capital market stocks are only permitted to be owned by stock brokers. International trend shows that global capital markets have changed their market ownership structure in order to increase governance and market integrity. External owners make the policy making process in that capital market become more transparent. 80 % stock exchanges in the world have been demutualized. Demutualization is an important stage in capital market regime to decrease and prohibit market manipulation. Figure 2 shows stages of demutualization process.

Literature Review

The existing literature documents mixed findings on the relative performance of foreign and domestic investors. Grinblatt and Keloharju(2000) and Seasholes (2004) reported that foreign investors were better traders, since they were better informed. They found evidence that foreign investors generally outperformed domestic investors. Brennan and Cao (1997), Hau (2001), Dvorčák (2005), Choe, Kho, and Stulz (2005), however, reported opposite findings. Dvorčák (2005) found that domestic investors earned higher profits than foreign investors in the Indonesian market. Choe, Kho, and Stulz (2005) reported that foreign investors paid more than domestic investors for purchases and received less for sales in the Korean market. After investigating the underlying reasons for foreign investors' poor performance, they found that foreign investors traded at worse prices because prices tended to move against them before they traded, indicating the poor timing of their trades. Even though Dvorčák (2005) and Choe, Kho, and Stulz (2005) agreed that foreign investors' trading performance was inferior to that of domestic investors, their explanation differed. Dvorčák (2005) attributed it to information disadvantage, while Choe, Kho, and Stulz (2005) relied on the poor timing of trades by foreign investors. Based on a much longer study period and more comprehensive data,

Agarwal et al (2009) found that foreign investors on the Jakarta Stock Exchange (JSX) paid 9 basis points more than domestic investors when they bought and that they received 14 basis points less than domestic investors when they sold. These results confirm the findings by Choe, Kho, and Stulz (2005) and Dvorák (2005).

We hypothesized that price manipulations were done mostly by domestic investors because of their relatively better access to short term information. Foreign investors' underperformance was caused by their lack of information concerning which stocks were being manipulated by domestic investors and domestic stock brokers. Foreign investor were trapped in pump and dump mechanism. They bought stocks when stock brokers' principalness to

buy index was high (LL state in Figure 3) and sold stocks while the manipulators were trying to dump those stocks (HL state).

Methodology

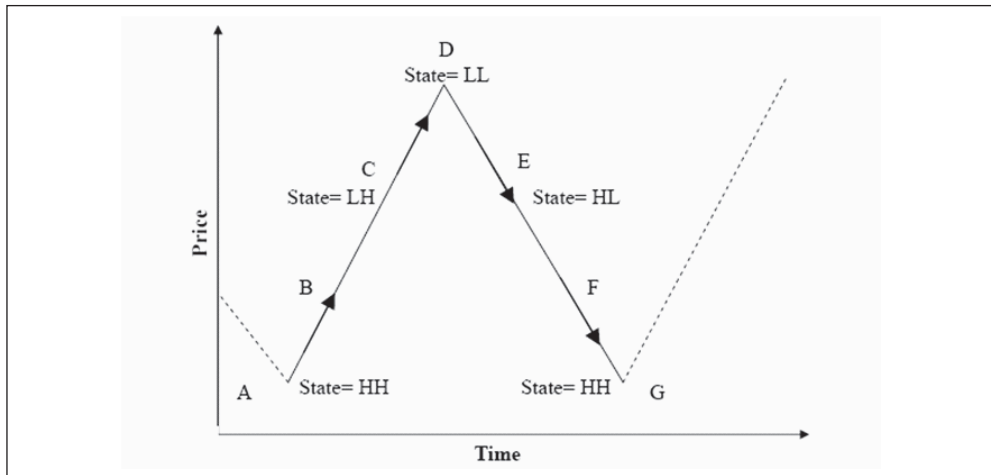
Price manipulation mechanism identification in emerging market is a challenging research. There are some theoretical models that try to explain how the manipulation works (Aggarwal dan Wu, 2006). The substantial broker influence intimated and the concern by the market regulatory body that "brokers mostly act as principals and not as intermediaries" suggest that we should start by examining trading patterns to see if this concern is legitimate. More generally, we wanted to identify any unusual trading patterns, and

Table 1. Principal and Intermediary Brokers Trading

Broker A (Intermediary) <i>PRIN</i> =0.05			Broker B (Intermediary) <i>PRIN</i> =1		
Trading Day	Shares Sold (1)	Shares Purchased	Trading Day	Shares Sold (2)	Shares Purchased
1	27,000	35,000	1	0	25,000
2	20,000	27,000	2	0	20,000
3	15,000	15,000	3	0	50,000
4	24,000	29,000	4	0	10,000
5	53,000	32,000	5	0	68,000
6	49,000	133,000
7	86,000	91,000	1	50,000	0
8	71,000	131,000	2	0	50,000
9	163,000	102,000	3	50,000	0
10	117,000	75,000	4	0	50,000
11	228,000	286,500	5	50,000	0
12	102,000	113,000	6	0	50,000
13	185,000	108,000	7	50,000	0
14	25,000	37,000	8	5,000	5,000
15	173,000	153,000	9	0	50,000
16	168,000	311,000
17	62,000	81,500	1	100,000	0
18	70,000	135,000	2	10,000	0
19	271,500	128,500	3	25,000	0
20	240,000	266,500	4	625,000	0

The table gives a snapshot of our original data set. We provide 20 trades for two different brokers trading the same stock. Each trade is at the day level, representing the total number of shares bought and sold by the broker during the entire day. The two brokers have different trading patterns, which are representative of our data. The Broker in Column 1, (Broker A) is both buying and selling the stock during the same day. We classify such a broker as an intermediary as he appears to be trading on behalf of a day. The broker in Column 2, (Broker B), only buys or sells the stock on a given day. This suggest that the broker is trading only on his own behalf or on a behalf of a single party. Broker B is clearly not intermediating on behalf of many outside investors. For this reason we define Broker B as a principal. Whether a broker is a principal or not is captured by our "principalness" measure, *PRIN*, defined as the probability (over time) that a given broker in a given stock will behave as a principal. A broker on a given day is said to behave as a principal, if he does a buy transaction only or does a sale transaction only or buys and sells the same amount of a stock on a given day. Using this definition, the *PRIN* values calculated for Brokers A and B are 0,05 and 1, respectively.

Figure 3. Degree of Principalsness & Pump and Dump Mechanism



Source: Khwaja and Mian (2006)

a suitable normality benchmark, given the context, whether a broker is acting as an intermediary for different outside investors.

We used the methodology that was proposed by Kwaja and Mian (2006). Table 1 shows the methodology.

Supposed the three types of principal trades identified in Table 1 signify that the broker was trading on his own behalf that day. The assumption that a principal trade always reflects a broker trading on his own behalf does not need to be true all the time. All that we need is that principal trading is correlated with a broker trading on his own behalf. Then for each broker in a given stock, we can compute the probability that a broker will do a principal trade. This is Khwaja and Mian's (2006) measure PRIN. The formula is as follows:

$$PRIN_{SB} = \frac{\text{Number of times broker } B \text{ trades as a principal in stock } S}{\text{Total number of times } B \text{ trades in stock } S} \quad (1)$$

The subscript SB is added to reiterate that PRIN is constructed separately for each broker B in every stock S. Thus, in our example of Table 1, Broker A had a PRIN

value of 0:05 for the 20 trades shown, 10 and Broker B, a PRIN value of 1.

Fig. 3 illustrates a stylized version of this mechanism but one that we believed reflects the reality reasonably well. We first classified each stock-date with a state variable IBIS, where IB and IS referred to the overall PRIN categories of buyers and sellers respectively trading the stock's stock on that date. For simplicity, let's assume that I can take a H(igh) or L(ow) value giving four possible states for a given stock-date: HH, LH, LL, and HL. The state variable LH means that the average PRIN of the brokers buying the stock's stock on that day is low, whereas the average PRIN of the brokers selling the stock on that day is high. The stylized mechanism works as follows. Start at a point where prices are at their lowest (point A). At this stage, manipulating brokers (with high PRIN) trade back and forth among themselves (the state at point A is HHP to create artificial momentum and price increases in the stock. This eventually attracts outside investors with extrapolative expectations (positive-feedback traders) to start buying (branches B and C). However, once the price has risen sufficiently, the manipulators exit the market leaving only

outsiders to trade amongst themselves (point D). The state when price is at its highest is thus LL. This artificially high price cannot be sustained and eventually the bubble bursts (branches E and F) and the outside investors start selling. Once prices are low enough, the manipulators can get back into the market to buy back their stock at low prices and potentially restart another pump and dump cycle (point G). The above mechanism is extremely stylized, and it is unlikely that it can be continuously used. Moreover, it relies on the existence of momentum traders and assumes that groups of brokers get together to manipulate prices as opposed to an individual trader doing so. However, because we were testing this mechanism directly, this also implies

these assumptions were tested as well. The mechanism implies that stock-date states can be used.

Data

We used all daily transactions on all stocks from all stock brokers in Bursa Efek Indonesia (Indonesian Stock Exchange) since January 2006 until Desember 2008. Principalsness to buy and to sell was measured daily.

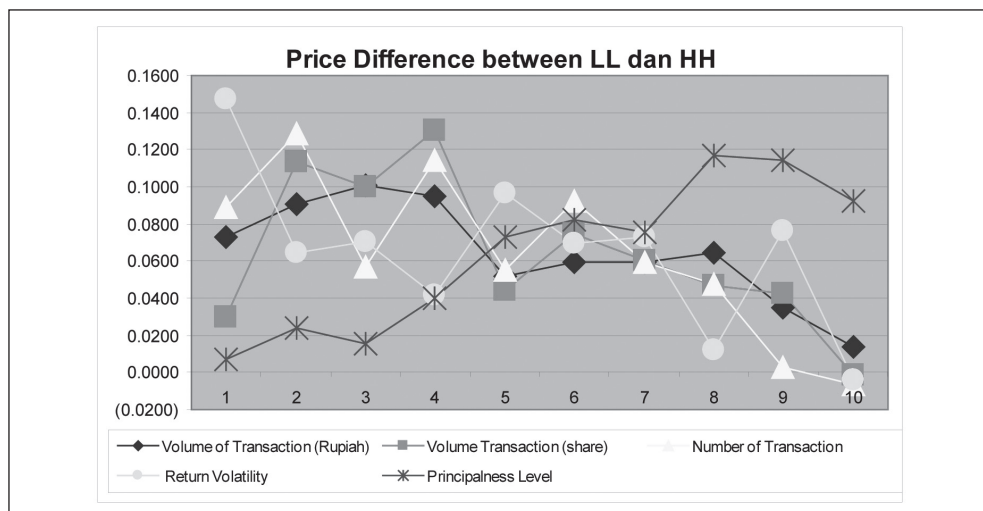
Result and Discussion

Before we tested the relationship between principal index and foreign transaction pattern, we needed to know the

Table 2. Price Difference Between LL and HH Principalsness State

Grouping Category	Group (1 highest decile, 10 lowest decile)									
	1	2	3	4	5	6	7	8	9	10
Volume of Transaction (Rupiah)	0.0731 (0.0155)*	0.0906 (0.0030)**	0.1010 (0.0014)**	0.0948 (0.0000)*	0.0515 (0.0446)**	0.0592 (0.0001)*	0.0594 (0.0021)**	0.0642 (0.0034)**	0.0348 (0.0956)	0.0136 (0.3395)
Volume Transaction (share)	0.0298 (0.1366)	0.1136 (0.0002)**	0.1001 (0.0003)**	0.1302 (0.0000)*	0.0442 (0.0149)*	0.0748 (0.0005)**	0.0604 (0.0046)**	0.0469 (0.0104)**	0.0424 (0.0271)*	0.0015 (0.4825)
Number of Transaction	0.0887 (0.0128)*	0.1287 (0.0000)*	0.0570 (0.0033)**	0.1141 (0.0001)*	0.0552 (0.0001)**	0.0925 (0.0002)**	0.0598 (0.0029)**	0.0480 (0.0001)*	0.0025 (0.4615)	0.0062 (0.4260)
Return Volatility	0.1477 (0.0000)*	0.0641 (0.0447)*	0.0705 (0.0095)**	0.0416 (0.0449)*	0.0970 (0.0019)**	0.0693 (0.0007)*	0.0729 (0.0001)*	0.0122 (0.2347)	0.0762 (0.0014)*	0.0042 (0.2681)
Principalsness Level	0.0072 (0.3825)	0.0242 (0.1775)	0.0153 (0.2817)	0.0400 (0.0148)*	0.0734 (0.0001)**	0.0824 (0.0002)**	0.0759 (0.0016)**	0.1167 (0.0000)**	0.1143 (0.0005)*	0.0920 (0.0050)*

Figure 4. Price Difference between LL and HH Principalsness State



existence of pump and dump mechanism. This manipulative mechanism exists if there are price difference between LL and HH stage. Groups of stocks were classified according to their volume of transactions, number of transaction, return volatility, and principal index. We found price difference

was significant in almost all category. We concluded that pump and dump mechanism existed in Indonesian Capital Market. Table 2 shows the result.

We also tested whether one could make profit by buying at HH state and selling at LL state. The result proved that the

Table 3. Buy Stock at Principalsness Strategy

	Holding Period				
	1 Week	2 Week	3 Week	4 Week	
Holding Period Return		2.96%	1.83%	1.38%	0.21%
Annualized Return		15.74%	9.47%	7.08%	1.03%
p Value	0.0000	0.0000	0.0000	0.0000	

Figure 5. State Trading Return

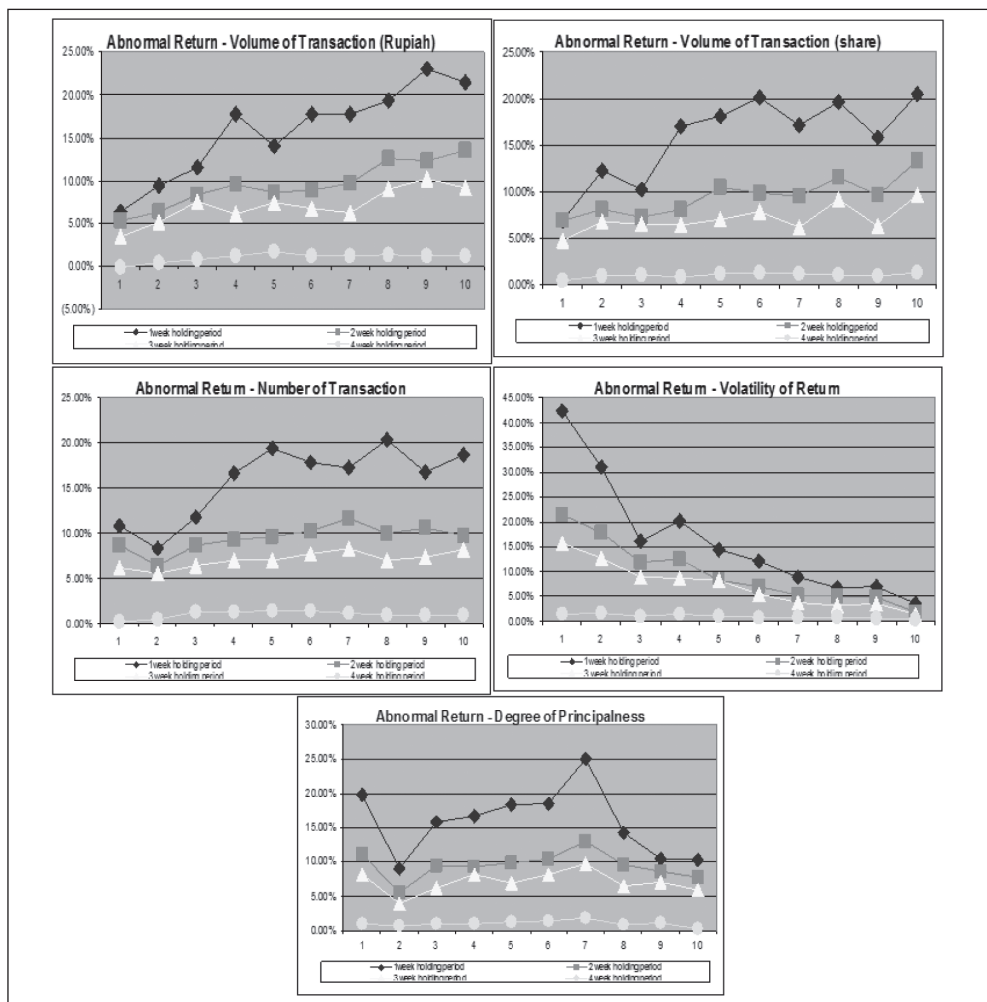


Table 4. Foreign Transaction Volume Difference Between LL and HH
 Principalness State

Group Category	Group (1 highest, 10 lowest)										
	All Data	1	2	3	4	5	6	7	8	9	10
Volume of Transaction (Rupiah)	0.0414 (0.1560)	0.0717 (0.2287)	0.0086 (0.4686)	0.2508 (0.0053)**	0.3497 (0.0204)*	(0.2211) (0.0793)	(0.0344) (0.3851)	0.1663 (0.1659)	(0.1314) (0.2398)	(0.0271) (0.3692)	(0.0178) (0.3408)
Volume of Transaction (number of share)	0.0414 (0.1560)	0.1143 (0.1797)	0.1934 (0.0307)*	0.1405 (0.1432)	0.0584 (0.3628)	0.0832 (0.2446)	(0.1690) (0.1879)	0.1604 (0.0906)	0.0022 (0.4921)	(0.1127) (0.2230)	(0.0505) (0.1299)
Number of Transaction	0.0414 (0.1560)	0.1047 (0.1397)	0.1810 (0.0519)	0.2301 (0.0516)	(0.0241) (0.4459)	0.0186 (0.4458)	0.0727 (0.3571)	0.0476 (0.3464)	(0.0453) (0.3149)	(0.1693) (0.1280)	0.0316 (0.0776)
Degree of Principalness	0.0414 (0.1560)	(0.1524) (0.1382)	(0.1198) (0.1211)	0.0922 (0.2257)	0.1041 (0.1208)	(0.0815) (0.2454)	0.0210 (0.4545)	0.2079 (0.0693)	0.0440 (0.3898)	0.1989 0.0772	0.1105 (0.1390)

hypothesis was true. Buying stock at HH state and selling 1 week later gave 2,96% return, and decrease until 4 week. Table 3 and Figure 5 show the result.

To test whether foreign investors were entrapped in pump and dump mechanism, we tested significance of volume difference between foreign buying transaction and foreign selling transaction in the state of LL. If foreign investors were entrapped, the volume of their buying transaction was much higher than that of their selling transaction in state of LL. The result was that foreign investors' buying transaction was, on average, 4,14 % higher than their selling transaction for one week holding period but it was not significant (p value = 15,6%). For robustness test, we classified the data by the degree of principalness and formed ten groups. We found that for all ten groups it seemed that foreign investors tended to buy more but most of them were not significant (level of error 5%). We could

conclude that foreign investors were not entrapped in a pump and dump mechanism.

Conclusion

There were indications that pump and dump mechanism existed in Indonesian stock market. Using Khwaja and Mian (2006) manipulation definition and measurement, we found that pump and dump mechanism occurred for around 4 weeks, from HH state that was when principal brokers started to pump stock price until HL state, that was when those brokers sold systematically their stocks. This mechanism gave profit to the brokers around 2.96% (15.74%, annualized). We also found that foreign investors were not entrapped in this manipulative mechanism. Even though we found that foreign investors' net buying was relatively high around the LL state, it was not statistically significant.

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