

The Wealth Effect of Foreign Investor Presence: Evidence from the Indonesian Market

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Abstract

This study investigates the wealth effect of foreign investor presence on the domestic market before and after the announcement of lifting foreign stock ownership restrictions on September 4, 1997 in Indonesia. We find that the presence of foreign investors is associated with positive wealth effects as indicated by positive cumulative abnormal returns. The impact of this event, however, is modest and short-lived because of the Asian financial crisis when the announcement was made. The sources of wealth effects are largely limited to trading efficiency variables (rather than market liquidity) despite the adverse impact of the Asian financial crisis.

1. Introduction

As of September 4, 1997, the Indonesian government eliminated a 49% foreign ownership restriction on Jakarta Stock Exchanges (JSX)-listed companies to discourage capital outflows from its financial system as the Asian financial crisis deepened. Under this new regulation, foreign investors were able to buy up to 100% of outstanding shares of non-financial companies. At this point, the Indonesian market was completely open to foreign investors.¹ This event provides a natural setting to study the effect of foreign investor presence (financial market liberalization) on shareholders' wealth.

Although this event involves the changing of foreign investment restrictions, we view them as the beginning of significant foreign investor presence in the Indonesian market. This event is similar to the changing of foreign limits in the Singapore market examined by Lam (1997) and the announcement of liberalization studied by Henry (2000a and 2000b) and Kim and Singal (2000). This study's main focus is on the wealth effects of financial market liberalization. This study differs from the past studies, however, in at least five aspects discussed below. First, Stulz and Wasserfallen (1995) study the Swiss companies that change foreign ownership restrictions voluntarily, hence the change is endogenous to the companies, while the Indonesian event is exogenous to all JSX-listed companies. Second, if policy makers liberalize the market when the economy is doing well, we may expect the positive wealth effect to be biased upward as we observe from Henry (2000a) and Kim and Singal (2000). Because the lifting of foreign ownership restrictions in September 1997 occurred in the midst of the Asian financial crisis, it should be interesting to observe whether or not the positive effect of foreign investor presence can hold up. Third, while Henry (2000a) and Kim and Singal (2000) use aggregate market data, we use the individual firm level data to investigate

¹ On January 28, 1998, the Indonesian government announced the removal of foreign ownership restriction for financial companies.

the effect of financial liberalization on the stock price behavior. The use of individual firm level data enables us to investigate the cross-sectional determinants of abnormal stock returns resulting from foreign investor presence. Fourth, our study highlights the differing effects of foreign investor presence on domestic stocks depending on their characterization in terms of efficiency and liquidity. This has not been done by the past studies. Fifth, this study examines the impact of significant foreign investors' presence on the stock price behavior, whereas a series of study by Bailey and Jagtiani (1994), Stulz and Wasserfallen (1995), Domowitz and Madhavan (1997), and Lam (1997) focuses on foreign investment restrictions or the violation of the law of one price as a result of segmented markets.

We find that the presence of foreign investors is associated with shareholder wealth-enhancing positive abnormal returns. The trading efficiency variables seem to explain the abnormal returns better than the changes in market liquidity. Financial market liberalization conducted during a financial crisis still exhibits positive benefits, while modest in its magnitude.

We organize this paper as follows. In Section 2, we discuss the institutional background of the Indonesian capital market. In Section 3, we introduce our data, discuss the methodology and the major results. In Section 4, we analyze cross-sectional determinants of wealth effects generated by the significant presence of foreign investors. We conclude in Section 5.

2. Institutional Background of the Indonesian Capital Market

The history of the Indonesian capital market dates back to its colonial era. The Dutch government established the first stock exchange in Batavia in 1912.² During the First World War, it was closed and then reopened in 1925. The Japanese occupation of

² Batavia became Jakarta, which is the capital of Indonesia.

Indonesia halted the exchange's operation. Seven years after Indonesian independence, the exchange was re-opened in 1952. The nationalization program in 1956 halted its trading again.

The modern JSX started in 1977 when President Soeharto re-opened the exchange. The Badan Pelaksana Pasar Modal (BAPEPAM) or the Capital Market Executive Agency, served as the operator and regulator of the JSX market. During the early years of the JSX, BAPEPAM set a priority of promoting and protecting domestic investors. The policy of promoting domestic investors was designed for wealth distribution. Foreign companies or joint venture companies were among the first companies to go public under this policy. The government established a financial company called Danareksa that has been serving as a closed-end investment company. In this role, Danareksa helped implement the policy of promoting domestic investors' participation in the market. For investor protection, the government strongly discouraged speculations. Price movements were limited to 4% daily. Danareksa actively intervened in the market when the limits reached 4%. At this stage, the market was closed for foreign investors.

Such microstructure policy did not appeal much to potential market players. Macro economic policy did not help either. In the early 1980's, the Indonesian government introduced a series of banking deregulation measures. These reform measures created a stiff competition in the banking industry, leading to a higher interest rate to make investment in stock market less attractive. From 1977 to 1988, there were only 24 listed companies. Most of these companies went public to satisfy the government's policy of promoting the welfare of domestic investors rather than raising equity capital. However, in the latter part of 1980s, the Indonesian stock market responded positively to the government's deregulation packages aimed at promoting stock investment. In 1988, the government removed the 4% price limits, relaxed listing requirements and procedures for going public, and, the most important of all, allowed foreign investors to buy up to 49% of outstanding

shares of listed stocks. The government started to impose taxes on interest income in the same year making stock investment more attractive relative to savings deposit.

In the two years following deregulation, the number of companies that went public increased significantly from 24 to 67. Along with the growth of Indonesian economy, the JSX index started to move up significantly. Figure 1 shows the appreciation of the JSX index from 1985 to 1998. Table 1 shows the number of companies that went public and the amount of fund raised since year 1977 to 1998.

[Insert Figure 1 and Table 1]

With the privatization in 1993, the JSX became a self-regulated organization owned by member brokerage firms. BAPEPAM shifted its role from managing and executing the exchange to a supervising one.³ In 1995, the JSX introduced automated trading system, called JATS (Jakarta Automated Trading System), to replace manual trading system. The Indonesian market suffered a setback when the financial crisis hit Indonesia in October 1997.

The Indonesian market provides a 'partial' cycle of foreign ownership regulation. Until December 1987, it was practically closed to foreign investment. The government started to open its market gradually. During the next 10 years, the Indonesian government introduced four key measures to open up the Indonesian stock market: (i) the Minister of Finance decree of September 16, 1989 allowed foreign investors to buy up to 49% of outstanding shares of all listed non-financial companies, (ii) the Minister of Finance decree of October 30, 1992 allowed foreign investors to buy up to 49% of outstanding shares of listed financial companies, (iii) the Minister of Finance decree of September 1997 allowed foreign investors to buy up to 100% of listed non-financial companies, and (iv) the Minister of Finance decree of January 28, 1998 allowed foreign

³ BAPEPAM is now translated into the Capital Market Supervisory Agency.

investors to buy up to 100% of listed financial companies. In this sequence of market liberalization, the September 1997 announcement represents the most important event that allows us to investigate the effect of significant foreign investor presence on the domestic stock price behavior.

3. Data, Methodology, and Major Findings

3.1. *The Data*

The daily price and volume data used in this study cover the period from May 1995 to August 1998. We focus on the regular board that is the most liquid market in Indonesia, accounting for about 83% [89%] of JSX's trading value [volume] during our study period.

3.2. *Stock Price Reactions to Two Major Events*

We use a modified market model to measure the price impact of foreign investor presence surrounding the event day of September 4, 1997 when foreign ownership restrictions are lifted. This modified market model is an improved variation of the standard event-study analysis for our tests because it accommodates the possibility of exogenous shift in market model parameters, while providing us the same pattern and timing of abnormal returns as those that would have been obtained from a conventional event-study approach which does not allow exogenous shift in the parameters [Binder (1985)].⁴

$$R_{i,t} = \alpha_i + \beta_{1i}R_{m,t} + \beta_{2i}R_{m,t+1} + \beta_{3i}R_{w,t} + \beta_{4i}D(1)_t + \beta_{5i}D(2)_t + e_{i,t}$$

where,

$R_{i,t}$ = daily return on stock i on day t ;

$R_{m,t}$ = daily return on the value-weighted JSX market index on day t ;

$R_{w,t}$ = daily return on the U.S. market portfolio (S&P 500 Index) return on day t ;

⁴ Recent applications of similar types of modified market models can be found in Amihud, Mendelson, and Lauterbach (1997) and Berkman and Eleswarapu (1998).

- D(1) = indicator variable assigned with certain values (depending on the time-horizon prior to the event day) and zero otherwise;
- D(2) = indicator variable assigned with certain values (depending on the time-horizon subsequent to the event day) and zero otherwise; and
- $e_{i,t}$ = random error terms.

Regressions are run for the period from $t = -150$ to $t = +150$. To address the problem of infrequent trading, we add lead and lag market return variables following Dimson (1979). Our preliminary investigation indicates that one period lead for market return provides the most consistent results as reported by Berkman and Eleswarapu (1998); hence, we use only one lead market return variable in both model specifications. Daily returns on the U.S. market index are introduced to capture the worldwide impact on the Indonesian stock price behavior even though the S&P 500 index is admittedly a crude proxy for the world market portfolio. Note that β_4 and β_5 measure pre- and post-event day cumulative abnormal returns over the event time-horizon. Five sets of event time-horizon are investigated to confirm the robustness of the results: (i) $t = -1$ to $t = +1$; (ii) $t = -3$ to $t = +3$; (iii) $t = -5$ to $t = +5$; (iv) $t = -10$ to $t = +10$; and (v) $t = -20$ to $t = +20$. Assigned values to indicator variables, D(1) and D(2), differ depending on the time-horizon selected. For example, we assign a value of 1/4 to D(1) for event days from $t = -3$ to $t = 0$ and zero otherwise; and assign a value of 1/3 to D(2) for event days from $t = +1$ to $t = +3$ and zero otherwise.

Table 2 summarizes five sets of regression results. Most remarkable but expected finding is that the impact of the Asian financial crisis is so intense that it seems to overwhelm the wealth effects of market liberalization. The only exceptions are the shortest time-horizons from $t = -1$ to $t = +1$ and from $t = -3$ to $t = +3$. During the post-event period, one [three]-day abnormal returns are 0.043% and 0.049%, respectively, and significant in the two regressions with short time-horizons, while regressions for

longer time-horizons exhibit negative abnormal returns after the announcement of market liberalization, indicating the dominance of the crisis-related market sentiment over the price behavior. It is possible that an information leakage may be associated with the government announcement. This is especially the case for the announcement of regulation because of the prolonged process of enactment [Binder (1985)]. In addition, since the government tends to introduce other reform measures simultaneously, Henry (2000a) points out the need to control for other liberalizations around the event date. In the case of information leakage, if we can identify the start of the leakage, then we may be able to isolate such effect. In view of possible confounding effects, we have introduced 21-day (from $t = -10$ to $t = +10$) and 41-day (from $t = -20$ to $t = +20$) windows to measure abnormal returns. Interestingly but not surprisingly due to the Asian financial crisis, negative welfare effects are exhibited for these event windows of much longer period. Contrasting results of welfare effects observed for the event windows of short and long period suggest that both the announcement of market liberalization and the Asian crisis simultaneously affect the results. Since we cannot confirm whether the negative reaction of stock prices observed for longer event windows is attributed to the new deregulation over foreign stock ownership or it is just manifestation of the adverse impact of the crisis itself. Therefore, it becomes important to examine the sources of cumulative abnormal returns, which is conducted in the next section.

[Insert Table 2]

To sum up, the findings based on five regressions suggest that the foreign investor presence is associated with positive abnormal returns, while this positive wealth effects exist only for a short window of 1 to 3 days. This event highlights the importance of the economic environment of market liberalization. This observation has one policy implication. Countries experiencing financial crises should explore other reform measures rather than focusing on market liberalization per se. For example, Johnson, et

al (2000) report a strong association between corporate governance in emerging markets and the severity of the Asian financial crisis. Hence, the improvement in corporate governance may help combat the severity of the financial crisis more effectively than the lifting of foreign ownership restrictions.

4. The Determinants of Abnormal Returns in the Event Period

Since our focus is on the potential benefits and costs associated with foreign investor presence, we identify several variables that proxy for the benefits and costs of foreign investors. Specifically, we focus on efficiency and liquidity measures as a potential explanation to the abnormal returns.

4.1. Liquidity

We introduce three variables to measure liquidity in the pre- and post-event periods, respectively: (i) market-adjusted trading volume; (ii) market-adjusted trading value; and (iii) market depth. The pre-event period is from $t = -150$ to $t = -31$ and the post-event period is from $t = +31$ to $t = +150$ for each stock.

A. Market-Adjusted Trading Volume [Value]: To control for the market-wide impact, we calculate market-adjusted trading volume (value), which is trading volume (value) recorded for each stock deflated by market trading volume (value). This adjustment is particularly important for the event under study, since this event occurred during the crisis period. Market-adjusted volume is denoted by TRDVOL.

B. Market Depth: Market depth is calculated, following Amihud et al. (1997) and Chang, et al. (1997):

$$\text{MKTDEP}_{i,t} = \frac{\sum \text{Volume}_{i,t}}{\sum |R_{i,t}|}$$

where

$\text{MKTDEP}_{i,t}$ = market depth of stock i on day t ;

Volume = daily trading volume; and

$|R|$ = absolute value of daily return.

Market depth measures additional volume per one unit of price change. The greater the market depth, the higher liquidity. This measure is consistent with Kyle (1985) who defines market depth as the trading volume per unit of price change.

4.2. *Efficiency Variables*

To measure trading efficiency, we calculate the variance of daily returns (VARRET) and the variance of residual returns (RESVAR) estimated from the single-factor market model.⁵ These variances are used as proxies for the level of trading noisiness in the pre- and post-event periods.

4.3. *Foreign Ownership Restriction Variables*

Of various variables suggested by the extant literature, we introduce two variables, following Bailey and Jagtiani (1994), to explain the behavior of the premium of the prices on the foreign board over the prices on the regular board. We include them in this study as control variables.

A. Size: This variable is used to proxy for information availability (Merton, 1987). Every year we calculate size as the closing price at the end of the year times the number of shares outstanding at the end of the year. Then we average the numbers to obtain the size variable. It is well documented that foreign investors prefer large and well-known companies (Kang and Stulz, 1997). An asset with a larger base of informed investors sells at higher price than that with a smaller base (Merton, 1987). We expect to have a positive association between size and abnormal returns for both events.

B. Trading Volume on Foreign Board: Bailey and Jagtiani (1994) suggest that trading volume on the foreign board can capture the degree of foreign investors' familiarity with domestic stocks. Prior to September 4, 1997 when the foreign ownership restriction of 49% was imposed, foreign investors must buy shares from other foreign

⁵ We also used variances of residuals from the modified market model introduced earlier but the results remain unchanged.

investors once the limits become binding. Foreign board was then created to facilitate trading of foreign owned shares among foreign investors. We predict a positive association between this variable and the abnormal returns during the event period.

C. Relative Supply: Another interesting variable introduced by Bailey and Jagtiani (1994) is the relative supply measure, which is defined as:

$$RS \text{ (Relative Supply)}_i = \frac{Vol_{i,Foreign}}{Vol_{Foreign}} - \frac{Vol_i}{TotVol}$$

where subscript i refers to individual stock, $Vol_{Foreign}$ refers to trading volume on foreign board and TotVol denotes total volume of all stocks. This variable measures the degree of tightness of foreign demand relative to the supply of stocks. A low value implies a high degree of tightness in the demand for the stock relative to its supply. Investors are willing to pay premium for the stock with this characteristic. We predict a negative relation between relative supply and the abnormal returns, i.e., the tighter the demand for a stock, the larger premium investors are willing to pay.

4.4. *Descriptive Statistics of Liquidity and Efficiency Variables*

Table 3 presents descriptive statistics in the pre- and post-event periods. The decline in liquidity measures and the increase in trading noise from the pre- to post-event period are reported. For example, market-adjusted trading volume [value] decline from 7.63 [7.14] in the pre-event period to 5.92 [5.96] in the post-event period. This is not unexpected considering the financial crisis adversely affecting the market performance. Market depth also declined from 54,784 in the pre-event period to 39,964 in the post-event period, recording over a 25% rate of decline. We observe a dramatic deterioration in market efficiency variable as indicated by the increase trading noise caused by the market turmoil caused during the Asian financial crisis.

[Insert Table 3]

4.5. *Cross-Sectional Regression: The Sources of Wealth Effects*

To investigate the joint effect of efficiency and liquidity variables on the abnormal returns, we perform a cross-sectional regression. The dependent variable is measured by β_3 of the market model: $R_{i,t} = \alpha_i + \beta_{1i}R_{m,t} + \beta_{2i}R_{m,t+1} + \beta_{3i}D_t + e_{i,t}$ where the indicator variable D is assigned a value of 1/4 for day $t = -1, 0, +1$, and $+2$, and zero otherwise. For liquidity variables (TRDVOL and MKTDEP) and daily returns (RET), their changes are defined as the differences between the pre- and the post-event period observations. For efficiency variables (RESVAR and VARRET), the changes are defined as the differences between the post- and the pre-event period observations. Under this specification, we expect to have negative coefficients for both efficiency and liquidity variables. Market prices noise increase and liquidity decrease negatively. Table 4 presents the result of the regression analysis.

[Insert Table 4]

In regression (1) of Table 4, we use the changes in liquidity to explain the abnormal returns. Estimated coefficients for liquidity are insignificant. In regression (2), we use the changes in efficiency. We find that the efficiency variables have significant coefficients, but with inconsistent signs between $\Delta RESVAR_i$ and $\Delta VARRET_i$. Given high correlation between the two variables, we orthogonalize them by performing regression of $\Delta VARRET_i$ on $\Delta RESVAR_i$ to obtain a proxy for the changes in the variance of daily return (PRX- $\Delta VARRET_i$).

In regression (3), we observe significant coefficients with expected signs (negative coefficients) for efficiency variables. Market seems to price negatively noise increase in the post-event period. Regression (4) of table 4 includes both the liquidity and the efficiency variables. We find that PRX- $\Delta VARRET_i$ has significant negative coefficient. Regression (5) includes return differences (ΔRET_i) along with the changes in the liquidity and the efficiency. We find a significant negative coefficient for PRX- $\Delta VARRET_i$. Regression (6), (7), and (8) include variables found to be the determinants of the premium of prices on the

foreign board over prices on the regular board. The power of $PRX-\Delta VARRET_i$ disappears. Smaller sample size may explain the weak results found in regression (6), (7), and (8). Size has an expected sign, while trading volume on foreign board and the degree of demand tightness show unexpected signs. None of these coefficients is significant at conventional level.⁶

[Insert Table 4]

5. Conclusion

This study attempts to investigate the effect of liberalization on domestic asset prices and the sources of asset price revaluation resulted from liberalization. We find that the announcement was associated with modest positive abnormal returns only for the 3-day window, whereas longer-term windows failed to provide any significant abnormal returns. When we investigate further the sources of abnormal returns, we find that the efficiency variables explain the abnormal returns better than do the liquidity variables. Specifically, market seems to price negatively noise increase in the post-event period. Liberalization in the crisis period could not minimize the noise associated with the crisis period as shown by increases of noise level in the post-event period. The setting of liberalization (boom, normal, and crisis periods), therefore, has varying effects on the domestic stock price behavior.

⁶ We have also used positive abnormal returns for the time-horizon from $t = -1$ to $t = +1$ as the dependent variable in this cross-sectional regressions. The results are similar to those summarized in Table 4.

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Figure 1 The Jakarta Stock Exchange Index (1985-1998)

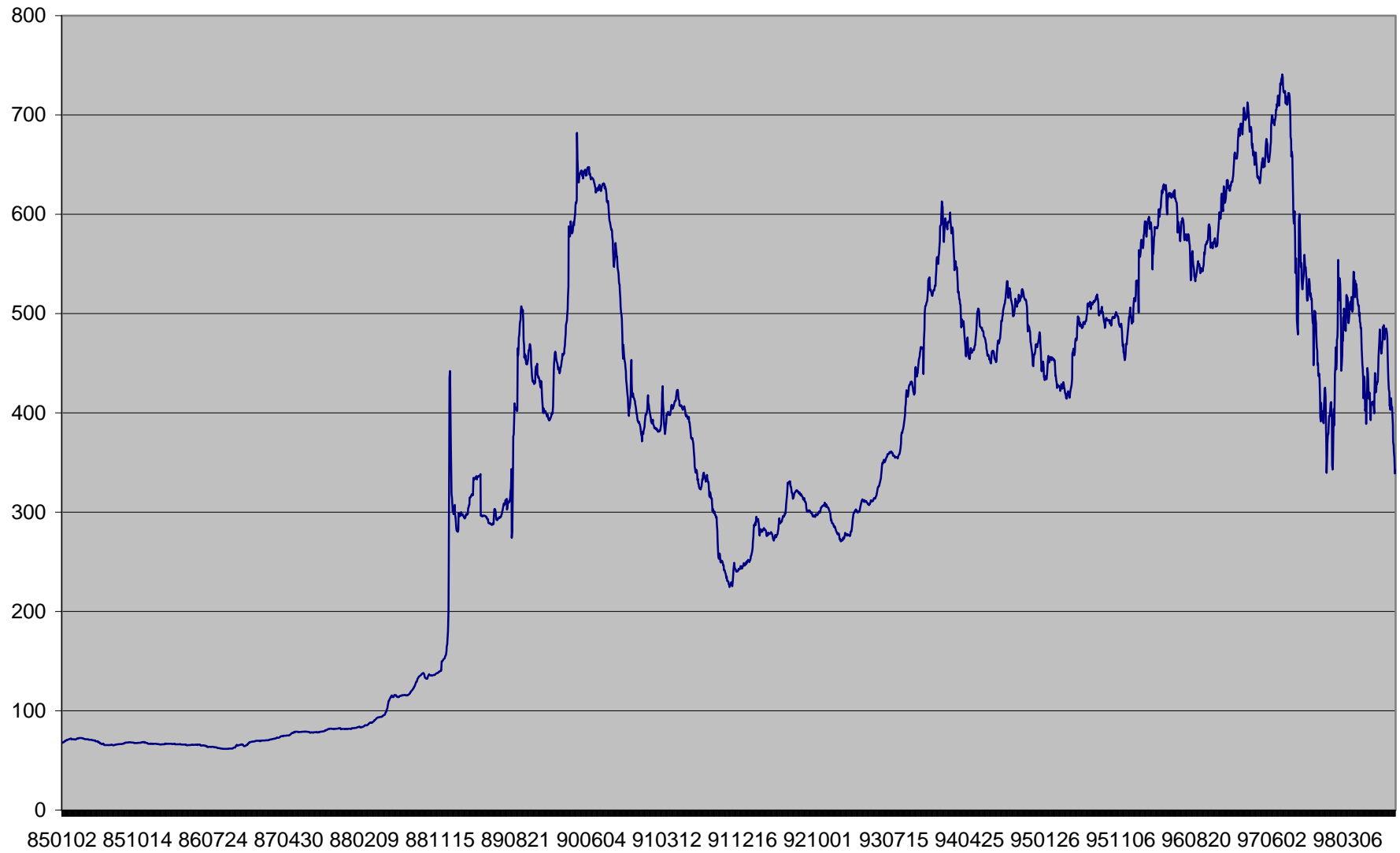


Table 1: Listing Firms and Fund Raised in The Jakarta Stock Exchange (1977 - 1998)

This table provides the historical record of companies that went public to be listed on the Jakarta Stock Exchange (JSX) in 1977-1998 and the amount of fund raised from going public.

Year	Issuer		Value (Rp Million)	
	Per-Year	Cumulative	Per-Year	Cumulative
1977	1	1	1,787.50	1,787.50
1978	0	1	-	1,787.50
1979	3	4	25,113.00	26,900.50
1980	2	6	8,527.50	35,428.00
1981	3	9	37,928.40	73,356.40
1982	5	14	20,262.60	93,619.00
1983	9	23	35,053.10	128,672.10
1984	1	24	320.50	128,992.60
1985	0	24	-	128,992.60
1986	0	24	407.10	129,399.70
1987	0	24	-	129,399.70
1988	1	25	44,309.10	173,708.00
1989	42	67	2,041,737.50	2,215,446.30
1990	65	132	5,221,651.60	7,437,097.90
1991	13	145	626,169.60	8,063,267.50
1992	17	162	743,665.00	8,806,932.50
1993	19	181	1,362,431.30	10,169,363.80
1994	50	231	4,804,494.00	14,973,857.80
1995	17	248	5,682,059.40	20,655,917.20
1996	19	267	2,662,207.30	23,318,124.50
1997	34	301	3,950,515.50	27,268,640.00
1998	3	304	68,125.00	27,336,765.00

Source: Bapepam Indonesia

Table 2: Cumulative Abnormal Return Around Event Day

This table presents five sets of regression results using the model: $R_{i,t} = \alpha_i + \beta_{1i}R_{m,t} + \beta_{2i}R_{m,t+1} + \beta_{3i}R_{w,t} + \beta_{4i}D(1)_t + \beta_{5i}D(2)_t + e_{i,t}$ where, $R_{i,t}$ = daily return on stock i on day t ; $R_{m,t}$ = daily return on the value-weighted JSX market index on day t ; $R_{w,t}$ = daily return on the U.S. market portfolio (S&P 500 Index) return on day t ; $D(1)$ = indicator variable assigned with certain values (depending on the time-horizon prior to the event day) and zero otherwise; $D(2)$ = indicator variable assigned with certain values (depending on the time-horizon subsequent to the event day) and zero otherwise; and $e_{i,t}$ = random error terms. Regressions are run for the period from $t = -150$ to $t = +150$. Five sets of event time-horizon are investigated to confirm the robustness of the results: (1) $t = -1$ to $t = +1$; (2) $t = -3$ to $t = +3$; (3) $t = -5$ to $t = +5$; (4) $t = -10$ to $t = +10$; and (5) $t = -20$ to $t = +20$. Assigned values to indicator variables, $D(1)$ and $D(2)$, differ depending on the time-horizon selected. For example, we assign a value of $1/4$ to $D(1)$ for event days from $t = -3$ to $t = 0$ and zero otherwise; and assign a value of $1/3$ to $D(2)$ for event days from $t = +1$ to $t = +3$ and zero otherwise. t -values are in parenthesis. ***, **, * mean statistical significance at 1%, 5%, 10% level respectively.

	(1)	(2)	(3)	(4)	(5)
Intercept	-0.003 (-4.73)***	-0.003 (-4.36)***	-0.002 (-3.83)***	-0.020 (-3.34)***	-0.002 (-2.38)**
$R_{m,t}$	0.008 (33.79)***	0.008 (33.53)***	0.008 (36.19)***	0.008 (36.24)***	0.008 (35.91)***
$R_{m,t+1}$	0.0010 (4.23)***	0.001 (5.05)***	0.001 (4.86)***	0.001 (4.50)***	0.001 (4.30)***
$R_{w,t}$	-0.0010 (-1.77)*	-0.001 (-1.87)*	-0.001 (-1.82)*	-0.001 (-1.69)*	-0.001 (-1.50)
$D(1)$	0.015 (1.02)	-0.054 (-2.22)**	-0.091 (-3.27)***	-0.100 (-2.76)***	-0.227 (-4.50)***
$D(2)$	0.043 (4.01)***	0.049 (2.70)***	-0.002 (-0.08)	-0.061 (-1.85)*	-0.096 (-1.97)**
Number of Observations	12,586	12,586	12,586	12,586	12,586
Adjusted R-Square	0.10	0.10	0.10	0.10	0.10

Table 3: Descriptive Statistics of Liquidity and Efficiency Variables around Event Day

Table 3 presents descriptive statistics of the liquidity and efficiency variables for the sample stocks before and after Event Two. Market-adjusted trading volume [value] is trading volume (value) recorded for each stock deflated by market trading volume (value). Market depth is defined as $MktDep_{i,t} = \frac{\sum Volume_{i,t}}{\sum |R_{i,t}|}$ where Volume = daily trading volume; and $|R|$ = absolute value of daily return. Daily returns are obtained from the PACAP-Indonesia databases. Residual returns are measured from the one-factor market model. The pre-event period is from $t = -150$ to $t = -31$ and the post-event period is from $t = +31$ to $t = +150$. ***, **, and * mean significant at 1%, 5%, and 10%.

	Mean	Minimum	Maximum	Standard Deviation	Num of Obs	t-value
Trading Volume (shares)						
Post	2,124,652	8	24,625,592	4,170,175	173	(6.702)***
Pre	1,462,964	13	12,040,720	2,705,255	171	(7.072)***
Difference	693,462	-19,484	11,184,271	4,590,266	167	(1.952)**
Trading Value (Rp)						
Post	2,254,533	6,512	64,553,420	6,507,212	173	(4.557)***
Pre	2,529,035	15,673	33,427,925	4,379,545	171	(7.551)***
Difference	-258,061	-32,764,527	49,498,224	6,953,435	167	(-0.479)
Market-Adjusted Trading Volume						
Post	5.92	0.01	84.35	13.54	162	(5.569)***
Pre	7.63	0.10	82.44	12.84	171	(7.769)***
Difference	-2.18	-80.57	69.99	16.68	156	(-1.636)*
Market-Adjusted Trading Value						
Post	5.96	0.01	145.69	17.91	162	(4.234)***
Pre	7.14	0.06	85.56	11.49	171	(8.127)***
Difference	-1.59	-82.51	140.25	18.52	156	(-1.071)
Market Depth (1,000)						
Post	39,964	125	634,162	85,749	173	(6.130)***
Pre	54,784	262	518,409	82,785	170	(8.628)***
Difference	-14,603	-488,718	513,274	93,164	166	(-2.019)**
Daily Residual Returns						
Post	-1.47E-15	-1.3359E-13	1.40E-13	3.64E-14	171	(-0.528)
Pre	-7.141E-16	-1.1828E-13	6.02E-14	2.41E-14	177	(-0.394)
Difference	-5.164E-16	-1.3578E-13	2.10E-13	4.46E-14	171	(-0.151)
Absolute Value of Daily Residual Returns						
Post	2.52E-14	0.00E+00	1.40E-13	2.63E-14	171	(12.535)***
Pre	1.73E-14	0.00E+00	1.18E-13	1.68E-14	177	(13.685)***
Difference	8.05E-15	-5.55E-14	1.33E-13	2.92E-14	171	(3.603)***

Table 3 (Continued)

Variance of Daily Residual Returns						
Post	0.0084	0.0003	0.0387	0.0060	171	(18.295)***
Pre	0.0027	0.0002	0.0190	0.0024	177	(15.237)***
Difference	0.0058	-0.0114	0.0341	0.0059	171	(12.832)***
Variance of Daily Returns						
Post	0.0097	0.0003	0.0423	0.0065	173	(19.707)***
Pre	0.0031	0.0002	0.0191	0.0024	177	(17.007)***
Difference	0.0067	-0.0114	0.0369	0.0064	173	(13.629)***
Mean of Daily Returns						
Post	-0.0043	-0.0338	0.0220	0.0068	173	(-8.279)***
Pre	-0.0032	-0.0161	0.0201	0.0047	177	(-9.194)***
Difference	-0.0009	-0.0257	0.0309	0.0078	173	(-1.432)

Table 4 The Cross-Sectional Determinants of Abnormal Returns Around The Announcement of Liberalization

The table presents regression coefficients of the cross-sectional determinants of the abnormal return during the announcement of financial liberalization on September 4, 1997. Abnormal return is estimated from coefficient regression of β_3 of the following model: $R_{i,t} = \alpha_i + \beta_{1i}R_{m,t} + \beta_{2i}R_{m,t+1} + \beta_{3i}D_t + e_{i,t}$. The indicator variable D is assigned a value of 1/4 for day $t = -1, 0, +1,$ and $+2,$ and zero otherwise. The model is estimated from day -150 to day $+150$. For liquidity variables (TRDVOL and MKTDEP) and actual return (RET), their changes are the differences between the observations in the pre- and post-event periods. For efficiency variables (RESVAR and VARRET), the changes are the differences between the observations in the post- and pre-event periods. Size is the closing price at the end of year times outstanding shares at the end of year. A proxy for the changes in the variance of daily return ($PRX-\Delta VARRET_i$) is obtained from the orthogonalization given high correlations between two efficiency variables ($\Delta RESVAR$ and $\Delta VARRET$). Details of variable definitions are explained in the text. t-values are in parenthesis. ***, **, and * mean significant at 1%, 5%, and 10% level.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Intercept	0.06 (4.812)***	0.08 (-4.246)***	0.05 (2.982)***	0.07 (4.240)***	0.07 (4.192)***	0.08 (2.001)*	0.09 (1.084)	0.11 (2.232)
Δ TRDVOL	5.19E-04 (0.426)	-	-	-2.78E-04 (-0.228)	-2.78E-04 (-0.227)	1.04E-03 (0.301)	-	-1.50E-03 (-0.444)
Δ MKTDEP	9.01E-11 (0.452)	-	-	-7.15E-11 (-0.369)	7.18E-11 (0.368)	-1.90E-10 (-0.252)	-	-3.33E-10 (-0.388)
Δ RESVAR	-	4.87E-03 (4.221)***	-1.26E-04 (-4.221)***	-1.78E-04 (-0.808)	-1.75E-04 (-0.748)	-	-2.26E-04 (-0.449)	-4.42E-04 (-0.888)
Δ VARRET	-	-44.64 (-4.221)**	-	-	-	-	-	-
PRX $-\Delta$ VARRET	-	-	-44.642 (-4.221)***	-41.069 (-3.115)***	-41.06 (-3.104)***	-	-52.81 (-1.529)	-50.02 (-1.609)
Δ RET	-	-	-	-	-0.07 (-0.037)	-	-	-
SIZE	-	-	-	-	-	3.45E-09 (0.469)	4.23E-09 (0.534)	1.61E-09 (0.221)
VOLFBOARD	-	-	-	-	-	-0.689 (-0.879)	-8.13E-01 (-0.941)	-9.84E-01 (-1.261)

Table 4 (Continued)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
RSUPPLY	-	-	-	-	-	0.35 (0.276)	0.81 (0.924)	1.11 (0.816)
Number of Obs	154	170	170	154	154	34	35	34
Adjusted R-Sqr	-0.06	0.08	0.09	0.05	0.04	-0.15	-0.03	-0.06