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PRICE AND VOLUME EFFECTS ASSOCIATED WITH CHANGES IN THE LQ 45 INDEX AND THE MSCI EQUITY INDEX LISTS

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This paper examines price and trading volume behavior surrounding announcements of changes in the composition of the liquidity (LQ) 45 and the Morgan Stanley Capital International (MSCI) Equity Index at the Jakarta Stock Exchange. Unlike listing studies in the developed markets, the announcements of the LQ 45 Index changes have no impact on share price and trading volume. This may be due to the small role of Indonesian domestic institutional investors and purely rule-based characteristics of the LQ 45 Index. On the contrary, the markets do respond to the changes in Indonesian stocks composition of the MSCI Equity Index. It seems that global portfolio managers, who dominate trading at the Jakarta Stock Exchange, rebalanced their portfolio when the changes in the MSCI Equity Index occurred because their performances are generally benchmarks to the return on the Index.

Keywords: event study; index changes; Jakarta Stock Exchange (JSX); the LQ 45 Index; the MSCI equity index

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Introduction

A number of empirical studies (e.g. Shleifer 1986; Dhillon and Johnson 1991; Harris and Gurel 1986; Jain 1987; Lynch and Mendenhall 1997; Kaul et al. 2000; Liu 2001) have examined the effects of changes in the list of stock indices. However, these studies have focused on the developed markets such as USA, Canada and Japan. Despite the widespread interest in emerging stock markets, relatively little is known about the impact of index changes on such markets. By studying index changes on the Jakarta Stock Exchange, this study is expected to provide evidence of the effect of index changes in an emerging market (i.e. Indonesia).

In addition, existing studies usually focus on one particular index in one particular market. This study examines the impact of index changes on share price and trading volume on the Jakarta Stock Exchange by comparing the effect of the changes in the Indonesian LQ 45 Index and that of the international Morgan Stanley Capital International (MSCI) Equity Index. The use of two different indices, with two different methods of construction, in the same market, is expected to enrich index changes literature.

There are at least three differences between the LQ 45 Index and the MSCI Equity Index that make the comparison interesting. *First*, due to the small role of institutional investors in Indonesia, it is unlikely to find portfolio rebalancing surrounding announcements of the LQ 45 Index changes. On the contrary, global portfolio managers are likely to rebalance their portfolio when the changes in the MSCI Equity Index occur because their performances are generally benchmarked to the return on the index. As global institutional investors dominate trading activity on the Jakarta Stock Exchange, the rebalancing may result in significant market reaction to the changes in the MSCI Equity Index.

Second, the LQ 45 Index tends to be a purely mechanical index because the changes are made based on certain rules. In contrast, Morgan Stanley Capital International attempts to combine rules and judgment in constructing the MSCI Equity Index. As a result, the information content of the changes in the LQ 45 Index is likely to be different from that of the changes in the MSCI Equity Index.

Third, the changes in the MSCI Equity Index are more irregular than the changes in the LQ 45 Index. Most of the changes in the MSCI Equity Index result from the changes in liquidity of shares, the restriction on foreign investment and availability of a better industry representative, making the changes less of a regular practice and possibly more of a surprise to investors. On the contrary, most changes in the LQ 45 are due to regular review (every six month), making less of a surprise to markets.

The study finds the announcements of the LQ 45 Index changes have no impact on share price and trading volume. This may be due to the small role of Indonesian domestic institutional investors and purely rule-based characteristics of the LQ 45 Index. On the contrary, the markets do respond to the changes in Indonesian stocks composition of the MSCI Equity Index. It seems that global portfolio managers, who dominate trading on the Jakarta Stock Exchange, rebalanced their portfolio when the changes in the MSCI Equity Index occurred because their performances are generally benchmarked to the return on the Index

Further analysis on share price reveals that the abnormal returns at announce-

ment dates are not permanent (i.e. the share prices back to its equilibrium value once the global institutional investors have rebalanced their portfolio), thus the evidence supports the price pressure hypothesis.

The remainder of this paper is organized as follows. Section 2 reviews the previous study and develops testable hypotheses. Data and methodology are discussed in Section 3. Section 4 presents the discussion of the empirical results, and finally, section 5 summarizes the results and concludes the study.

Literature Review and Hypotheses Development

A number of empirical studies have examined the changes in the list of stock indices (e.g. Shleifer 1986; Dhillon and Johnson 1991; Harris and Gurel 1986; Jain 1987; Lynch and Mendenhall 1997; Kaul et al. 2000; Liu 2001). These studies find that price increases (decreases) significantly for stocks added (deleted) while those having examined volume effects report that trading volume increases significantly for both. Four possible explanations for price and trading volume movement around the time of an index change are mentioned in previous studies, namely downward sloping long-run demand curves for stocks (the imperfect substitute hypothesis), temporary price pressure associated with portfolio rebalancing (the price pressure hypothesis), the announcements of index change containing value-relevant information (the information content hypothesis) and addition or deletion affecting stock's liquidity (the liquidity hypothesis). Each of these hypotheses is briefly described below.

The Downward-Sloping Demand Hypothesis

The downward sloping demand hypothesis predicts that index fund will buy new stocks added to the index and sell stocks deleted from the index in order to mimic the return on the index (Shleifer 1986; Liu 2001). Such actions represent a rightward shift in demand for added stocks and a rightward shift in supply for deleted stocks. If the demand curve is flat, inclusions or exclusion from the index should not result in the changes in share prices. On the other hand, the share price is predicted to increase (in the case of stocks additions) and to decrease (in the case of stock deletions) if the demand curve for stock slopes down. Price reversals are not expected under the downward sloping demand hypothesis since the new equilibrium prices reflect new distributions of security holders (Harris and Gurrel 1986). Shleifer (1986), Kaul et al. (2000) and Liu (2001) found evidence consistent with the downward sloping demand hypothesis.

The Price Pressure Hypothesis

Many large index funds in the United States try to replicate the performances of the S&P 500 Index. They frequently purchase the added stocks and sell the deleted stocks within a few days of the index changes announcements, which lead to a shift in stock's demand. Harris and Gurel (1986) argue that suppliers of liquidity can demand higher prices during the temporary increase in demand from index funds at the time of the index changes. Once index funds have achieved their desired portfolio positions and abnormal demand has subsided, price should return to normal levels. This theory, known as the price

pressure hypothesis, implies that the positive (negative) returns over the rebalancing period should be offset by subsequent negative (positive) returns of approximately equal magnitude.

Using a sample of index inclusions from 1973 through 1983, Harris and Gurel (1986) find that abnormal returns of 3.13 percent at announcement date is accompanied by a cumulative abnormal return of -2.49 percent over the next 29 trading days. They argue that the findings support the price pressure hypothesis because a price increase is followed by a price decline.

The Information Content Hypothesis

According to Kaul et al. (2000) Standard and Poor does not use a judgment to the investment appeal of the stocks as a selection criteria for index changes and thus, the changes in the S&P 500 Index is not an information event. However, another objective of the changes is to keep the index representative and up to date. This objective raises the possibility that, when a stock is added to the S&P 500, favorable information about the expected financial health of the company is being revealed by Standard and Poor, the agency that specializes in rating companies. Furthermore, the list of stocks being considered for inclusion or exclusion is kept secret until the change is announced. Hence, it is possible that the index changes may convey new information about the future prospects of the firm and the announcements are viewed as good news (in the case of additions) or bad news (in the case of deletions). Evidence supporting the information hypothesis is provided by Jain (1987) and Dhillon and Johnson (1987).

The Liquidity Hypothesis

The underlying premise of the liquidity hypothesis is the work of Amihud and Mendelson (1986), who argue that the required rate of return on a stock varies directly with expected trading costs. If inclusion in (exclusion from) index is followed by increased (decreased) scrutiny by analysts, investors and institutions, the firms information environment is richer (poorer) and the stock will be traded more (less) widely and become more (less) liquid and therefore decrease (increase) the trading costs (Beneish and Gardner 1995). Consequently, if the listing of a stock in index results in a decline (rise) in expected trading costs, then the stock price should permanently rise (decline). Beneish and Gardner (1995) and Beneish and Whaley (1996) found evidence supports the liquidity hypothesis.

Testable Hypotheses

Testable Hypotheses Related to the Changes in the LQ 45 Index

In 1997, the Jakarta Stock Exchange (JSX) introduced a new index called LQ (LiQuidity) 45 Index. Compared to the existing index, the JSX Composite Index, which is computed based on all shares listing on the JSX, the LQ 45 Index consist of only 45 shares that represent the most liquid and highly capitalized stocks. In 1997, they represent 72 percent of total market capitalization and 72.5 percent of regular market turnover in the JSX.

The index changes are made regularly (i.e. at the beginning of February and August). According to the official website of the Jakarta Stock Exchange, the selection criteria as a basis for the changes in index composition are (i) shares must rank

among the top 60 of total regular market trading during the past 12 months, (ii) shares must have been listed on the JSX for a minimum of 30 stock exchange trading days, (iii) shares must have high ranks in term of market capitalization (based on average daily capitalization for the past 12 months) and (iv) the expected financial health of the firms and the liquidity prospects of shares. In brief, the criteria used in the deletion or addition decisions involve mainly the liquidity of the stocks and the future prospect of the companies.

In practice, however, the main criteria for the changes in the LQ 45 Index is basically the past liquidity of shares and not the future performance of firms. According to Mas Achmad Daniri,[1] as cited in KONTAN Magazine dated 24 April 2000, the rules (i.e. the criteria and the weight) of the changes in the LQ 45 are trading volume (50 percent), the ratio of trading volume to market capitalization (20 percent), the number of days at which stocks are traded (20 percent) and the number of days at which stock prices change (10 percent). All of these criteria are public information and none of them is concerned with the future performance of the firm. Since the time for index changes are known exactly and the selection criteria are based only on publicly-available information, the changes in the LQ 45 Index are unlikely to convey any new information.

The performances of Indonesian institutional investors tend to be benchmarked relative to the Jakarta Stock Exchange indices such as the LQ 45 Index and the JSX Composite Index. However, the role of domestic institutional investors in Indonesia remains small (Montgomery 1997). Although the growth of pension funds is quite high, existing funds invest 85 percent of their assets in bank deposits. Mutual funds that are permitted to invest 85 percent of their assets in stock markets have been introduced only very recently, with the first closed-end funds starting operation in October 1995. Moreover, indexed funds that usually replicate the market index are not well developed in Indonesia. Therefore, it is unlikely to find evidence of a significant portfolio rebalancing at the time of the changes in the LQ 45 Index.

In short, the changes in the LQ 45 Index are not only unlikely to convey any new information, but also unlikely to be followed by a significant portfolio rebalancing by institutional investors. Therefore, it can be argued that in the case of the LQ 45 Index, the stock additions and deletions are expected to have no impact on share prices. The arguments lead to the following hypotheses,

H_1: *There are no significant changes in share price due to the announcements of the new stocks included in the LQ 45 Index.*

H_2: *There are no significant changes in share price due to the announcements of the stocks deleted from the LQ 45 Index.*

Previous studies (e.g. Harris and Gurel 1986; Beneish and Gardner 1995; Kaul et al. 2000; Liu 2001) found abnormal trading volume associated with new information arrival or portfolio rebalancing due to the changes in the index lists. Since the changes in the LQ 45 Index are unlikely to convey new information or to be followed by a significant portfolio rebalancing, it can be argued that the changes in the LQ

[1] At the time of the interview, Mas Achmad Daniri is the managing director of the Jakarta Stock Exchange, Indonesia.

45 Index list are expected to have no impact on trading volume, leading to the following hypotheses,

H_3: There are no significant changes in the trading volume following the announcements of the new stocks included in the LQ 45 Index.

H_4: There are no significant changes in the trading volume following the announcements of the stocks deleted from the LQ 45 Index.

Testable Hypotheses Related to the Changes in the MSCI Equity Index

The MSCI Equity Index is a global benchmark index designed by Morgan Stanley Capital International (MSCI). The index is expected to serve as the performance benchmark for a wide variety of global institutional investors. There are various reasons for changes in the index, including significant changes in market capitalization, liquidity and industry classification, the restriction of foreign ownership, and availability of a better industry representative.

Morgan Stanley Capital International claims that the MSCI Equity Index is not a purely rule-based and mechanical index. According to its official website, the changes in the MSCI Equity Index is decided by the Index Committee. The members of the committee consist of experienced research staff that has expertise in country and company research. In order to attain certain desirable attributes of a benchmark index, the committee uses not only certain rules but also judgment in constructing the index. As professionals specializing in country and company research, the committee may have and exploit non-public information about firms when determining the index changes. As a result, the selection by capable committee may convey new information to the markets. In addition, unlike the changes in the LQ 45 Index, the changes in the MSCI Equity Index are not made regularly and therefore, may give a surprise to the markets.

As the changes in the MSCI Equity Index may convey new information, the announcements of additions (deletions) may be interpreted as good news (bad news), which leads to an increase (decrease) in stock prices. Various editions of KONTAN magazine in Indonesia documented significant market reactions to the changes in the MSCI Equity Index. For example, when the proportion of Indonesian stocks included in the MSCI Equity Index decrease (increase), the stock prices on the Jakarta Stock Exchange generally fell (rose).

Based on the survey of Pensions & Investments, Morgan Stanley Capital International claims that the MSCI Equity Index is the most widely used benchmark by global portfolio managers. As a result, the performances of global portfolio managers tend to be judged relative to the MSCI Equity Index. This gives an incentive to form portfolios that replicate the performance of the MSCI Equity Index. In order to minimize tracking error, global portfolio managers may make period adjustments in their portfolio. The managers will therefore tend to hold the shares listed in the index, and may under or overweight certain shares in attempting to outperform the index. This creates an incentive to buy shares entering the index and sell those leaving the index. In Indonesia, global portfolio investors are known as foreign investors. Bonser-Neal et al. (1999) point out the dominance of foreign investors on the Jakarta Stock Exchanges market. Since foreign investors who dominate trading

tend to be benchmarked using the MSCI Equity Index, the changes in the index may lead to a significant portfolio rebalancing. That is, the index funds or institutional investors buy new stocks added to the index and sell stocks deleted from the index and therefore, the share price is predicted to increase (in the case of stocks additions) and to decrease (in the case of stock deletions).

Both information content and portfolio rebalancing arguments above lead to the following hypotheses

H_5: *There are increases in share price due to the announcements of the new Indonesian stocks included in the MSCI Equity Index.*

H_6: *There are decreases in share price due to the announcements of the Indonesian stocks deleted from the MSCI Equity Index.*

The changes in the composition of Indonesian stocks of the MSCI Equity Index may convey new information and the information arrival is associated with high trading volume. In addition, the changes in the MSCI Equity Index also create an incentive for foreign investors in Indonesia to rebalance their portfolio (i.e. to buy added stocks and to sell deleted stocks). Both arguments lead to the following hypotheses,

H_7: *There are increases in the trading volume following the announcements of the new Indonesian stocks included in the MSCI Equity Index.*

H_8: *There are increases in the trading volume following the announcements of the Indonesian stocks deleted from the MSCI Equity Index.*

Data and Method

Data and Period of Analysis

This study analyzed the changes in the LQ 45 Index and the MSCI Equity Index from 1998 to 2001. The number of stocks included and excluded from the LQ 45 Index during the period of analysis is equal (51 changes each). Out of the 51 stocks dropped from the index, the identity of 7 stocks was not available on the website of the Jakarta Stock Exchange. Furthermore, 7 deleted stocks and 7 new added stocks are excluded from the sample due to the unreliability of the data. Therefore, the final sample of the changes in the LQ 45 Index consisted of 37 excluded stocks and 44 included stocks.

From 1998 to 2001, the number of Indonesian stocks added to and deleted from the MSCI Equity Index were only 6 and 15, respectively. Out of 15 deletions, four stocks were removed from the index due to delisting action by the Jakarta Stock Exchange and therefore excluded from the sample.

The announcement dates and the list of the changes are collected from the website of the Morgan Stanley Capital International and the Jakarta Stock Exchange while the data on stock prices and trading volume are collected from the Jakarta Stock Exchanges website. Unfortunately, the stock prices and trading volume data in year 1997 and 1998 were not available from the website and therefore are collected from Bloomberg. In order to check the reliability of the data provided by Bloomberg, the author compared the

stock prices and trading volume data in 1999 and 2000 with the data available from JSX website randomly. If the data in year 1999 and 2000 were different, the author assumed the data in 1997 and 1998 were not reliable and hence were not used in this study. This screening process leads to the dropped of 7 stocks included in and 7 stocks excluded from the LQ 45 Index.

Method

In order to test the hypotheses, event study method is employed. Day 0 is defined as the announcement date. Event period is defined from day -30 to day +30 while estimation period is from day -120 to day -31.

The analysis of this study is organized as follows. *First*, the sample is divided into two sub-samples, stocks added into and stock deleted from the indexes. *Second*, for each sub-sample, the univariate analysis on the behavior of the share price and trading volume is conducted. *Finally*, if the study finds the abnormal return, it is necessary to determine whether the changes are permanent or not.

Method for Share Price Analysis

A modified event study method discussed in Jain (1986) is used for share price analysis. Daily returns are calculated by adjusting for cash dividend, stock dividend, stock split and any other capitalization changes using the method described in Bishop et al. (1993: 148). The expected returns are estimated from the following market model:

$$\tilde{R}_{it} = \alpha_i + \beta_i \tilde{R}_{mt} + \tilde{e}_{it} \qquad (1)$$

where,

R_{it} = return on security *i* on day *t*;

R_{mt} = return on the Jakarta Composite Index on day *t;*

$\tilde{e}_{it}$ = an error term for security *i* on day *t*.

In order to adjust beta due to infrequent trading, the Fowler and Rorke (1983) procedure with four leads and four lags is used (Hartono 2000).

The excess return, deviation of actual returns from expectations are defined for security *i* in period t as follows,

$$AR_{it} = R_{it} - (\hat{\alpha}_i + \hat{\beta}_i R_{mt}) \qquad (2)$$

Equally weighted portfolios of firms in the sample are formed in event period. Average portfolio abnormal returns (across firms in the sample) for each day t are calculated as:

$$AAR_t = \frac{1}{n} \sum_{i=1}^{n} AR_{it} \qquad (3)$$

where *n* is the number of securities for day *t*.

Daily cumulative average abnormal return, *CAARs*, are sums of average abnormal return over event period (i.e. CAAR for the period $t = a$ until $t = b$) are defined as follows:

$$CAAR_{ab} = \sum_{t=a}^{b} AAR_t \qquad (4)$$

A *t*-statistic that tests whether the average abnormal return of portfolio for day d is significantly different from zero are calculated as:

$$t_d = AAR_t/S \qquad (5)$$

where *S* is estimated standard deviation of market model residuals for the portfolio of sample firm in the estimation period.

Assuming independence across days, the *t*-statistics for *CAAR* for a period of *T* days from day *a* to day *b* are calculated by:

$$t_{ab} = CAAR_{ab}/(S/\sqrt{T}) \qquad (6)$$

In addition, the significance of daily *AAR* are also tested using a large sample approximation of a standard sign test (Campbell et al. 1997):

$$Z = \left[\frac{N^{+}}{N} - 0.5\right] \frac{N^{1/2}}{0.5} \qquad (7)$$

where,

N = total number of observations

N+ = actual number of positive abnormal returns

As pointed out by Anderson et al. (1989) the normal approximation of the sampling distribution in sign test can be used if the sample size is greater than 20. Since the number of stocks added to and deleted from the LQ 45 are both greater than 20, the normal approximation can be used. In the case of the changes in the MSCI Equity Index, however, the sign test for the small-sample case should be used because the sample size for both stocks added to and stocks deleted from the index are less than 20.

Method to Detect Price Reversal

The price pressure hypothesis predicts a price reversal once index funds have rebalanced their portfolio and abnormal demand has subsided. On the contrary, other hypotheses imply permanent price impact. Accordingly, if abnormal returns are found during the announcement date, it is important to detect whether the changes in share price are permanent or not.

In order to detect price reversal, the following cross-sectional regression is estimated as follows (Kaul et al. 2000),

$$CAR_{1\text{-}T,j} = \alpha + \theta\, AR_{0,j} + \varepsilon_{1\text{-}T,j} \qquad (8)$$

The dependent variable, $CAR_{1\text{-}T,j}$, is the cumulative abnormal stock return beginning in day +1 through day *T*. The independent variable, $AR_{0,j}$, is the abnormal return in day *0*. Kaul et al. (2000) argue that if $CAR_{1\text{-}T,j} = -AR_{0,j}$ the price increase on day *0* is completely reversed on day *T*. Therefore, the two hypotheses to be compared are:

$H_0 : \Phi = -1$ (complete reversal)

$H_a : \Phi \neq -1$ (no reversal)

Method for Trading Volume Analysis

Another frequent finding of previous work on the effect of index listing is a substantial increase in trading volume in the event period. To investigate the change in trading volume, a volume ratio (VRi), as in Harris and Gurel (1986), for each security for event time period t is calculated:

$$VR_{it} = \frac{V_{it}}{V_{mt}} \times \frac{V_{m}}{V_{i}} \qquad (9)$$

where V_{it} and V_{mt} are the trading volume in shares of security *i* and the security's primary exchange (i.e., JSX) total trading volume in event period *t*, respectively, and V_i and V_m are the average trading volume of security *i* and its primary listing exchange in the estimation interval [-120, -31]. If there is no change in the trading volume of stock *i* in relation to the overall market volume in the event period, the expected value of VR_{it} is one.

Subsequently, a cross-sectional mean of VR_{it} is computed for the all securities (N) in the sample and denoted MVR_t,

$$MVRt = \frac{1}{N} \sum_{i} VR_{it} \qquad (10)$$

The statistical significance of the abnormal volume is tested in two ways. *First*, a standard *t*-test is used to test the null hypothesis that the MVR_t is equal to unity. *Second*, as in the share price analysis, the significance of daily MVR_t are tested using a sign test calculated using equation 7 where N^+ is defined as actual number of observations with a mean volume ratio greater than unity. The procedure of sign test for share price is also used in the analysis of trading volume.

Empirical Results

Price and Trading Volume Effects of the Changes in the LQ 45 Index

Previous studies in developed markets suggest that affected stocks experience statistically significant abnormal return surrounding announcements of index changes. Table 1 summarizes the price effects of the changes in the LQ 45 Index. Unlike existing studies, the changes in the LQ 45 Index seem to have no impact on share price and therefore support Hypotheses 1 and 2.

On the event day, the average abnormal return for added stocks is negative which is inconsistent with theory. However, it is not statistically significant. Similarly, the average abnormal return for deleted stocks is negative and indistinguishable from zero. The result seems to be driven by a few outliers because the majority of abnormal returns on the event day are positive (61.11 percent). Therefore, it can be concluded that there are no significant price effects on the event day.

In the pre-event period, most of the average abnormal returns are not statistically significant for both added stocks and deleted stocks. If the significant price effects are found (at day -1 for added stocks and at day -25 for deleted stocks), they are not supported by the sign test. Taken together, the results indicate that there is no information leakage. Following the announcement date, there is a significant average abnormal return for added stocks at day +15. Again, the result is not supported by nonparametric test indicating no price effects in the post-event period.

Table 2 presents the trading volume effects of the LQ 45 Index changes. Since informational arrivals and portfolio rebalancing are associated with high trading volume, the trading volume should increase due to index changes. However, consistent with Hypotheses 3 and 4, the statistical analysis suggests that no abnormal level of trading activity occurs at the time of the LQ 45 changes.

On the event day, although the mean volume ratio for both added and deleted firms are greater than 1, they are not statistically distinguishable from 1. The percentage of individual volume ratio greater than 1 for added and deleted firms are respectively 29.17 percent and 38.24 percent, suggesting that the mean volume ratios on the event day are driven by a few outliers.

In the pre-event and post-event period, most of daily mean volume ratios are again numerically greater than one. Also, the average mean volume ratio over pre-event period (-30, -2) and over post-event period (+2, +30) are significantly greater than 1 for both added stocks and deleted stocks. However, one could attribute the results to outliers since they are not supported by the sign test. The proportion of individual volume ratios greater than 1 is generally less than 35 percent.

The findings are similar to DJIA listing studies (Beneish and Gardner 1994). They argue that the findings are consistent

Table 1. **Summary of Abnormal Return Earned by Firms Added to and Deleted from the LQ 45 Index of the Jakarta Stock Exchange during 1998-2001**

Event Day	Additions				Deletions			
	Average Abnormal Return[a]	t-statistic*	Percentage Non-Negative	z-statistic**	Average Abnormal Return[a]	t-statistic*	Percentage Non-Negative	z-statistic**
-30	-1.26%	-0.851	41.30%	-1.180	-0.13%	-0.124	52.78%	0.333
-25	1.38%	0.834	52.17%	0.295	2.68%	1.899 ***	66.67%	2.000
-20	-1.28%	-0.871	41.30%	-1.180	-1.74%	-1.256	30.56%	-2.333 **
-15	0.79%	0.534	43.48%	0.885	0.81%	0.555	58.33%	1.000
-10	1.53%	1.093	43.48%	-0.885	-1.23%	-0.864	41.67%	-1.000
-9	0.12%	0.052	54.35%	0.590	0.98%	0.642	52.78%	0.333
-8	0.12%	0.094	60.87%	1.474	1.32%	0.966	61.11%	1.333
-7	-2.30%	-1.561	43.48%	-0.885	0.65%	0.463	52.78%	0.333
-6	-0.57%	-0.393	63.04%	1.769 ***	2.31%	1.683	75.00%	3.000 *
-5	1.64%	1.095	58.70%	1.180	-0.73%	-0.522	50.00%	0.000
-4	-1.55%	-1.102	54.35%	0.590	0.02%	0.006	63.89%	1.667
-3	0.63%	0.427	58.70%	1.180	-0.22%	-0.183	55.56%	0.667
-2	2.14%	1.449	60.87%	1.474	1.44%	1.046	52.78%	0.333
-1	2.72%	1.834 ***	60.87%	1.474	1.34%	0.948	55.56%	0.667
0	-1.02%	-0.702	45.65%	-0.590	-0.71%	-0.535	61.11%	1.333
1	1.36%	0.899	58.70%	1.180	0.83%	0.603	44.44%	-0.667
2	1.37%	0.899	39.13%	-1.474	0.14%	0.119	38.89%	-1.333
3	0.43%	0.301	34.78%	-2.064 **	0.42%	0.303	52.78%	0.333
4	0.48%	0.307	54.35%	0.590	-0.52%	-0.353	52.78%	0.333
5	-1.39%	-0.912	50.00%	0.000	1.24%	0.923	63.89%	1.667
6	-0.02%	-0.028	60.87%	1.474	0.86%	0.630	58.33%	1.000
7	0.15%	0.085	58.70%	1.180	1.55%	1.112	72.22%	2.667 **
8	1.69%	1.091	50.00%	0.000	-0.85%	-0.599	57.14%	0.845
9	-1.79%	-1.185	32.61%	-2.359 **	1.13%	0.839	47.22%	-0.333
10	0.19%	0.112	58.70%	1.180	0.42%	0.298	69.44%	2.333 **
15	-2.58%	-1.695 ***	43.18%	-0.905	1.01%	0.753	44.44%	-0.667
20	-1.29%	-0.833	58.70%	1.180	1.52%	1.085	75.00%	3.000 *
25	-0.46%	-0.295	47.83%	-0.295	1.73%	1.251	41.67%	-1.000
30	-0.68%	-0.422	45.65%	-0.590	1.94%	1.436	66.67%	2.000 **
(-30,-2)	-2.56%	-0.325	47.79%	-1.616	2.24%	0.319	51.39%	0.553
(-1,+1)	3.06%	1.166	55.07%	1.192	1.48%	0.421	53.92%	0.962
(+2,+30)	-2.59%	-0.298	50.98%	0.595	2.66%	0.402	50.07%	0.037

[a] The market model abnormal returns are estimated using the Fowler and Rorke (1983) procedure (4 leads and 4 lags).

*, ** and *** denote significance at the 0.01, 0.05 and 0.1 levels, respectively (two-tailed test)

* t-statistic for testing whether the average abnormal return is different from 0.

** z-statistic (a large sample approximation of a standard sign test) for testing whether the percentage of positive average abnormal return is different from 50 percent.

Table 2. **Summary of Abnormal Trading Volume of Firms Added to and Deleted from the LQ 45 Index of the Jakarta Stock Exchange during 1998-2001**

	Additions				Deletions			
Mean Event Day	Mean Value Ratio	t-statistic*	Percentage >1	z-statistic**	Mean Volume Ratio	t-statistic*	Percentage >1	z-statistic**
-30	0.770	-1.232	16.67%	-4.619 *	1.551	1.689 ***	41.18%	-1.029
-25	1.760	1.758 **	35.42%	-2.021 **	1.871	1.425	32.35%	-2.058 **
-20	0.974	-0.104	25.00%	-3.464 *	0.979	-0.084	20.59%	-3.430 *
-15	2.088	1.539	31.25%	-2.598 **	1.120	0.539	44.12%	-0.686
-10	1.633	0.921	31.25%	-2.598 **	1.452	1.252	35.29%	-1.715
-9	1.889	1.059	27.08%	-3.175 *	1.310	0.769	26.47%	-2.744 *
-8	1.565	1.024	31.25%	-2.598 **	1.164	0.618	32.35%	-2.058 **
-7	1.072	0.306	25.00%	-3.464 *	1.694	1.545	55.88%	0.686
-6	1.346	0.708	22.92%	-3.753 *	0.997	-0.011	35.29%	-1.715 ***
-5	0.957	-0.156	18.75%	-4.330 *	0.706	-1.822 ***	23.53%	-3.087 *
-4	1.004	0.015	22.92%	-3.753 *	1.260	0.665	26.47%	-2.744 *
-3	1.314	0.754	25.00%	-3.464 *	1.326	0.710	26.47%	-2.744 *
-2	1.168	0.555	27.08%	-3.175 *	2.812	1.687	38.24%	-1.372
-1	0.979	-0.085	18.75%	-4.330 *	0.940	-0.182	20.59%	-3.430 *
0	1.208	0.684	29.17%	-2.887 *	1.647	1.477	38.24%	-1.372
1	1.174	0.427	25.00%	-3.464 *	1.221	0.532	32.35%	-2.058 **
2	1.964	0.911	29.17%	-2.887 *	1.208	0.595	32.35%	-2.058 **
3	1.163	0.578	27.08%	-3.175 *	1.647	1.370	32.35%	-2.058 **
4	0.938	-0.333	29.17%	-2.887 *	1.057	0.162	29.41%	-2.401 **
5	0.926	-0.328	27.08%	-3.175 *	1.320	0.646	29.41%	-2.401 **
6	1.263	0.992	37.50%	-1.732 ***	1.144	0.343	26.47%	-2.744 *
7	1.140	0.430	25.00%	-3.464 *	0.817	-0.681	20.59%	-3.430 *
8	0.912	-0.412	27.08%	-3.175 *	1.007	0.018	26.47%	-2.744 *
9	0.852	-0.767	25.00%	-3.464 *	0.832	-0.818	29.41%	-2.401 **
10	0.726	-1.353	18.75%	-4.330 *	0.807	-0.844	20.59%	-3.430 *
15	1.400	1.004	37.50%	-1.732 ***	1.357	0.703	20.59%	-3.430 *
20	0.972	-0.082	22.92%	-3.753 *	1.044	0.114	23.53%	-3.087 *
25	1.160	0.613	31.25%	-2.598 **	1.045	0.155	32.35%	-2.058 **
30	1.441	1.500	35.42%	-2.021 **	1.458	0.905	26.47%	-2.744 *
(-30,-2)	1.363	3.415 *	25.65%	-18.145 *	1.383	4.285 *	32.66%	-10.891 *
(-1,+1)	1.120	0.645	24.31%	-6.167 *	1.270	1.159	30.39%	-3.961 *
(+2,+30)	1.272	3.572 *	28.09%	-16.350 *	1.172	2.102 ***	26.37%	-14.840 *

*, ** and *** denote significance at the 0.01, 0.05 and 0.1 levels, respectively (two-tailed test)

* t-statistic for testing whether the mean volume ratio is different from 1

** z-statistic (a large sample approximation of a standard sign test) for testing whether the percentage of mean volume ratio greater than 1 is different from 50%

with the fact that no index rebalancing occurs at the time of DJIA changes since index fund portfolios are historically tied to the S&P 500 Index and not to DJIA.

As explained in literature review section, there may be two explanations why there are no reactions to the announcements of LQ 45 Index changes. *First*, the announcements of the LQ45 Index changes are not value-relevant information. The index changes are made regularly (i.e. at the beginning of February and August). In addition, the data used to decide the index changes are mainly past trading volume and market capitalization, all of which are public information by nature. Therefore, it is reasonable to find that the LQ Index changes do not convey any new information and surprise to the market.

Second, the changes in the LQ 45 Index are not followed by significant portfolio rebalancing because the role of domestic institutional investors remains small in Indonesia. Two main institutional investors in Indonesia are pension funds and mutual funds (Montgomery 1997). However, the funds they invested on stocks markets are relatively small, and therefore, although they rebalance their portfolio, the effects may not significant on the market.

Price and Trading Volume Effects of Changes in the MSCI Equity Index

Table 3 summarizes the price effects of the changes in the Indonesian stocks composition of the MSCI Equity Index. Unlike the evidence on the changes in the LQ45 Index, investors at the Jakarta Stock Exchange seem to react to the changes in the MSCI Equity Index and the response is consistent with the previous studies in developed markets.

As expected, the event-day average abnormal returns of the Indonesian firms added to the MSCI Equity Index are positive 2.31 percent and statistically significant at 10 percent level, and thus support Hypothesis 5. It appears that this significant price effects are not due to a few outliers given that all of the sample firms experience a positive return. This price effect is less than the average price effect reported for additions to the S&P 500, which is around 3 percent (Jain 1986; Shleifer 1986; Lynch and Mendenhall 1997) but greater than that of the Nikkei 500, which is 1.54 percent (Liu 2001).

Consistent with the Hypothesis 6, there is a significant price decrease when the Indonesian stocks are deleted from the MSCI Equity Index. The average abnormal returns of the Indonesian stocks deleted from the MSCI Equity Index are negative 11.23 percent. The results from both parametric and nonparametric tests suggest that the event-day abnormal returns are significantly different from zero. The magnitude of abnormal return, however, is greater than that in developed markets such as USA, Canada and Japan.

The behavior of cumulative abnormal return (as shown in Figure 1) also supported the analysis based on average abnormal return. Consistent with the previous studies in developed markets, the cumulative average abnormal returns during post-event period for stock additions tend to be positive while that of stock deletion tend to be negative.

Table 4 reports the volume effects of the changes in the MSCI Equity Index. The trading volume effects of the changes in the MSCI Equity Index are similar to S&P listing study (Harris and Gurrel 1986) and Nikkei 500 listing study (Liu 2001). The mean volume ratios at event day are significantly greater than 1 for both types

Table 3. **Summary of Abnormal Return Earned by Indonesian Firms Added to and Deleted from the Morgan Stanley Capital Index during 1999-2001**

	Additions				Deletions			
Event Day	Average Abnormal Return[a]	t-statistic*	Percentage Positive	p-value**	Average Abnormal Return[a]	t-statistic*	Percentage Positive	p-value**
-30	-1.53%	-0.765	16.67%	0.109	1.79%	0.421	54.55%	0.500
-25	1.06%	0.521	66.67%	0.343	1.78%	1.405	81.82%	0.032 **
-20	1.01%	0.475	50.00%	0.656	-1.84%	-0.225	9.09%	0.005 *
-15	0.51%	0.265	83.33%	0.109	-1.45%	1.779	72.73%	0.113
-10	-0.09%	-0.025	16.67%	0.109	-1.46%	0.623	27.27%	0.113
-9	2.25%	1.119	66.67%	0.343	1.74%	0.415	81.82%	0.032 **
-8	-0.92%	-0.456	16.67%	0.109	4.05%	0.976	81.82%	0.032 **
-7	0.32%	0.145	50.00%	0.656	-3.56%	-0.821	27.27%	0.113
-6	2.84%	1.323	83.33%	0.109	-2.91%	-0.701	63.64%	0.274
-5	-6.21%	-3.312 **	16.67%	0.109	1.91%	0.467	81.82%	0.032 **
-4	4.02%	2.021 ***	83.33%	0.109	-3.93%	-1.001	36.36%	0.274
-3	4.12%	2.125 ***	100.00%	0.015 **	-6.55%	-1.555	45.45%	0.500
-2	-0.22%	-0.115	50.00%	0.656	3.98%	1.045	81.82%	0.032 **
-1	-0.57%	-0.281	50.00%	0.656	2.05%	2.848 **	81.82%	0.032 **
0	2.31%	2.158 ***	100.00%	0.015 **	-11.23%	-2.824 **	9.09%	0.005 *
1	2.11%	1.032	83.33%	0.109	6.14%	1.468	54.55%	0.500
2	-5.99%	-3.021 **	0.00%	0.015 **	1.58%	0.389	63.64%	0.274
3	6.22%	3.123 **	100.00%	0.015 **	-1.61%	-2.735 **	9.09%	0.005 **
4	6.07%	2.967 **	66.67%	0.343	3.22%	0.789	81.82%	0.032 **
5	-1.89%	-0.935	33.33%	0.343	0.31%	0.082	27.27%	0.113
6	-2.38%	-1.173	16.67%	0.109	-2.55%	-0.621	36.36%	0.274
7	-1.39%	-0.775	33.33%	0.343	5.10%	1.199	90.91%	0.005 *
8	0.17%	0.098	33.33%	0.343	1.22%	1.032	63.64%	0.274
9	-1.84%	-0.809	16.67%	0.109	-4.14%	-1.323	9.09%	0.005 *
10	1.97%	0.963	83.33%	0.109	-6.55%	-0.645	18.18%	0.032 **
15	2.36%	1.144	83.33%	0.109	2.29%	1.754	36.36%	0.274
20	0.10%	0.057	50.00%	0.656	3.23%	-0.123	54.55%	0.500
25	0.17%	0.067	50.00%	0.656	-1.49%	0.433	27.27%	0.113
30	0.08%	0.029	66.67%	0.343	-1.89%	1.623	54.55%	0.500
(-30,-2)	8.29%	1.715	49.44%	0.444	2.99%	1.003	55.68%	0.012 **
(-1,+1)	3.85%	0.811	61.11%	0.178	-3.04%	-0.229	48.48%	0.500
(+2,+30)	-1.99%	-0.351	42.26%	0.025 **	-6.98%	-0.568	45.45%	0.436

[a] The market model abnormal returns are estimated using the Fowler and Rorke (1983) procedure (4 leads and 4 lags).

*, ** and *** denote significance at the 0.01, 0.05 and 0.1 levels, respectively (two-tailed test).

* *t*-statistic for testing whether the average abnormal return is different from 0.

** *p*-value (calculated based on the binomial probability distribution) for testing whether the percentage of positive average abnormal return is different from 50 percent.

Table 4. **Summary of Abnormal Trading Volume of Indonesian Firms Added to and Deleted from the Morgan Stanley Capital Index during 1999-2001**

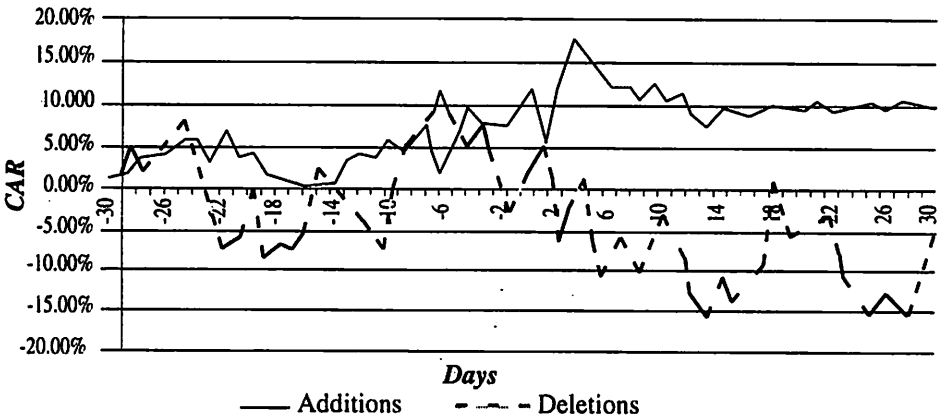
	Additions				Deletions			
Mean Event Day	Mean Volume Ratio	t-statistic+	Percentage > 1	p-value++	Mean Volume Ratio	t-statistic+	Percentage > 1	p-value++
-30	1.77	1.265	66.67%	0.343	0.71	-0.812	18.18%	0.032 **
-25	1.05	0.192	33.33%	0.343	0.67	-0.596	9.09%	0.005 *
-20	1.79	2.005	66.67%	0.343	4.50	1.129	36.36%	0.274
-15	3.02	2.248 ***	83.33%	0.109	0.43	-2.756 **	18.18%	0.032 **
-10	6.11	2.074 ***	100.00%	0.015 **	11.29	1.015	45.45%	0.500
-9	4.01	1.751	100.00%	0.015 **	2.32	1.101	36.36%	0.274
-8	3.12	2.020 ***	83.33%	0.109	4.15	0.983	45.45%	0.500
-7	3.98	2.130 ***	83.33%	0.109	3.45	0.889	36.36%	0.274
-6	1.78	3.947 **	100.00%	0.015 **	1.34	0.511	27.27%	0.113
-5	1.72	1.780	83.33%	0.109	0.95	-0.101	18.18%	0.032 **
-4	2.81	1.915	66.67%	0.343	1.22	0.268	18.18%	0.032 **
-3	5.41	2.598 **	100.00%	0.015 **	8.53	2.768 **	90.91%	0.005 *
-2	2.14	1.950	66.67%	0.343	6.54	2.348 **	81.82%	0.032 **
-1	2.42	3.522 **	100.00%	0.015 **	3.15	2.267 **	81.82%	0.032 **
0	2.54	4.242 *	100.00%	0.015 **	3.20	2.015 ***	90.91%	0.005 *
1	2.76	2.420 ***	100.00%	0.015 **	2.60	1.943	63.64%	0.274
2	1.02	0.074	50.00%	0.656	0.67	-2.060 ***	27.27%	0.113
3	1.47	2.007	83.33%	0.109	1.00	0.023	36.36%	0.274
4	1.87	1.822	66.67%	0.343	0.87	-0.279	18.18%	0.032 **
5	5.40	1.543	83.33%	0.109	1.61	1.370	45.45%	0.500
6	2.60	1.761	83.33%	0.109	1.66	0.738	27.27%	0.113
7	4.00	2.200 ***	83.33%	0.109	0.56	-2.291 **	27.27%	0.113
8	4.09	2.269 ***	83.33%	0.109	1.14	0.317	45.45%	0.500
9	5.27	2.021 ***	66.67%	0.343	0.63	-1.796	27.27%	0.113
10	4.07	1.680	66.67%	0.343	0.34	-5.522 *	9.09%	0.005 *
15	2.70	0.935	33.33%	0.343	2.09	0.687	27.27%	0.113
20	1.57	0.638	33.33%	0.343	7.68	1.439	36.36%	0.274
25	1.27	0.476	33.33%	0.343	0.59	-1.895 ***	27.27%	0.113
30	0.49	-3.091 **	16.67%	0.109	1.42	0.841	45.45%	0.500
(-30,-2)	2.98	7.969 *	77.59%	0.000 *	3.49	3.606 *	28.84%	0.000 *
(-1,+1)	2.58	5.494 *	100.00%	0.000 *	2.99	3.677 *	78.79%	0.001 *
(+2,+30)	2.61	5.817 *	60.92%	0.004 *	2.51	2.571 **	27.59%	0.000 *

*, ** and *** denote significance at the 0.01, 0.05 and 0.1 levels, respectively (two-tailed test for t-test and one-tailed test for sign test)

+ *t*-statistic for testing whether the mean volume ratio is different from 1

++ *p*-value (calculated based on the binomial probability distribution) for testing whether the percentage of mean volume ratio greater than 1 is different from 50%

Figure 1. **Cumulative Abnormal Return of Indonesian Stocks Aded to and Deleted from the MSCI Equity Index**



of the affected stocks, and thus support Hypotheses 7 and 8. At the announcement date, trading volume of added stocks and deleted stocks are respectively 2.54 and 3.20 times as large as the normal volume (defined as the average trading volume over 90 days prior to event window). Tests of whether these mean volume ratios are equal to 1 reject equality in both cases. Moreover, the individual volume ratios greater than one is 100 percent and 79 percent respectively, indicating that the mean volume ratios are not driven by a few outliers.

Interestingly, the pre-announcement volume data indicate that the markets anticipate the announcements. The mean volume ratios for days -3 and -1 (-3 to -1) are significantly different from unity for the added stocks (deleted stocks). The results suggest that investors start to purchase the added securities and sell the deleted securities 3 days before the announcement date.

Possible Explanations for the Price and Trading Volume Effects of the Changes in the MSCI Equity Index

As discussed in the literature review section, there are two possible explanations for the behavior of price and trading volume effects around the changes in the MSCI Equity Index. *First*, the MSCI Equity Index is the most widely used benchmarks by global portfolio managers. Since their performances tend to be judged relative to the MSCI Equity Index, portfolio manager will try to form portfolio that replicate the performance of the MSCI Equity Index. This creates an incentive to buy shares entering the index and sell those leaving the index. In Indonesia, global portfolio investors are known as foreign investors. Bonser-Neal et al. (1999) point out the dominant of foreign investors in trading on the Jakarta Stock Exchanges markets. Since foreign investors who domi-

nate trading tend to be benchmarked using the MSCI Equity Index, the changes in the index may lead to a significant portfolio rebalancing.

The second explanation is that the changes in the MSCI Equity Index may convey new information to markets. The changes in the MSCI Equity Index are decided by the Index Committee. In order to attain certain desirable attributes of a benchmark index, the committee uses not only certain rules but also judgment in constructing the index. As professional specializing in country and company research, the committee may have and exploit non-public information about firms when determining the index changes. As a result, the selection by capable committee may convey new information to the markets

Further analysis below indicates that portfolio rebalancing (i.e. the price pressure hypothesis) is the most likely possible explanation of the markets' reaction to the changes in the MSCI Equity Index.

Table 5 **Regression Estimates in a Test of Return Reversals of Indonesian Firms Added to and Deleted from the Morgan Stanley Capital Index during 1999-2001** ###

Dependent Variable	Addition			Deletion		
	α	Φ	t-Statistic Φ = 1	α	Φ	t-Statistic Φ = 1
$CAR_{1\text{-}1,j}$	0.0008	0.8767	5.128 *	-0.1056	-1.3987	-1.912 ***
$CAR_{1\text{-}2,j}$	-0.0363	-0.2121	1.222	-0.1010	-1.4301	-1.422
$CAR_{1\text{-}3,j}$	0.0071	0.7876	2.991 **	-0.2401	-1.7005	-1.789
$CAR_{1\text{-}4,j}$	0.0167	3.1039	3.323 **	-0.1821	-1.5012	-1.553
$CAR_{1\text{-}5,j}$	0.0301	1.6901	2.601 ***	-0.1778	-1.4621	-1.556
$CAR_{1\text{-}6,j}$	0.0276	0.6505	1.422	-0.1498	-0.9780	0.116
$CAR_{1\text{-}7,j}$	0.0502	-0.8887	0.132	-0.0779	-0.8390	0.623
$CAR_{1\text{-}8,j}$	0.0599	-1.4476	-0.276	-0.0832	-1.0023	0.065
$CAR_{1\text{-}9,j}$	0.0391	-1.2756	-0.191	-0.1050	-0.7934	0.792
$CAR_{1\text{-}10,j}$	0.0456	-0.6865	0.121	-0.1799	-0.8699	0.434
$CAR_{1\text{-}15,j}$	0.0301	-1.0301	-0.042	-0.0497	-0.2287	3.215 *
$CAR_{1\text{-}20,j}$	-0.0221	1.0705	0.999	0.0676	-0.6105	1.112
$CAR_{1\text{-}25,j}$	-0.0035	0.3475	0.698	-0.0201	-0.3871	1.886 ***
$CAR_{1\text{-}30,j}$	-0.0256	1.1321	0.787	0.0476	-0.6487	1.051

The cross sectional regression, $CAR_{1\text{-}T,J} = \alpha + \alpha AR_{0,J} + \varepsilon_{T,T,J}$ where $CAR_{1\text{-}T,J}$ is the cumulative abnormal return from day 1 to day t and $AR_{0,J}$ is the abnormal return on day 0. The coefficient on $AR_{0,J}$ equal -1 under the price pressure prediction of complete reversal. The coefficient on $AR_{0,J}$ equals zero under hypothesis of no reversal.

'*' and '***' denote significance at the 0.01, 0.05 and 0.1 levels, respectively (two-tailed test)

Harris and Gurrel (1986) and Beneish and Gardner (1995), among others, argue that price reversals are not expected under the downward sloping demand curve, the information content hypothesis, and the liquidity hypotheses. On the other hand, the price pressure hypothesis predicts a price reversal once the investment managers have rebalanced their portfolio and the abnormal demand has been subsided. Therefore, it is important to analyze whether the price effects at announcement date are permanent or not.

Following Kaul et al. (2000), the cross-sectional regression, $CAR_{1,T,j} = \alpha + \theta AR_{0,j} + \varepsilon_{1,T,j}$ are estimated where $CAR_{1,T,j}$ is the cumulative abnormal stock return beginning in day +1 through day T and $AR_{0,j}$, is the abnormal return in day 0. They argue that if $CAR_{1,T,j} = -AR_{0,j}$ (i.e. θ equals to -1) the price increase on day 0 is completely reversed on day T. They also argue that if the coefficient on $AR_{0,j}$ is not significantly different from zero, there is no price reversal. Table 5 reports the regression results.

An examination on the point estimate of coefficient on $AR_{0,j}$ suggests that the price reversal occurs 6 or 7 days after announcement date. The value of θ is -0.8887 for added stocks (at day 7) and is -0.9780 for deleted stocks (at day 6), which is close to the expected value (-1). Based on statistical analysis, however, the price reversal occurs at day 6 (in the case of included stocks) and at day 2 (in the case of excluded stocks). The hypothesis of complete reversal is rejected on day 1, 3, 4 and 5 for Indonesian stocks added to the MSCI Equity Index. From day 5, however, the hypothesis of complete reversal fails to be rejected, indicating that the share price returns to its equilibrium value. Similarly, for deleted stocks, the hypothesis of complete reversal is rejected on day 1, but cannot be rejected after that day.

Overall, the regression results indicate that the price responses at event-day due to the changes in the MSCI Equity Index are not permanent. Once the global institutional investors have rebalanced their portfolio, the share prices back to its equilibrium value, thus the evidence supports the price pressure hypothesis.

Conclusion and Suggestion for Further Research

Summary and Conclusion

This study investigates the impact of changes in the composition of the LQ 45 and the MSCI Equity Index on share price and trading volume on the Jakarta Stock Exchange. Unlike listing studies in developed markets, the study finds that the announcements of LQ 45 Index changes have no impact on share price and trading volume. Since changes are based only on publicly available information and on well-known criteria, they do not reveal new information about future return distribution. In addition, the role of domestic institutional investors, the party that potentially use the LQ 45 Index as a benchmark index, remains small. As a result, there is no portfolio rebalancing around the time of the changes in the LQ 45 Index.

Although there is no reaction to the changes in the LQ 45 Index, the markets do respond to the changes in Indonesian stocks composition of the MSCI Equity Index. On average, price increases (decreases) significantly for stocks added (deleted). Trading volume data also reveal that investors start to buy the added stocks and sell the deleted stocks within a few days before the index changes announcements. The dominant role of foreign investors on the Jakarta Stock Exchange may explain why markets do react to the

changes in the MSCI Equity Index. As global portfolio managers, the performances of foreign investors in Indonesia tend to be benchmarked relative to the MSCI Equity Index. If a share found in the MSCI Equity Index is not found in a portfolio of global investors, the mismatch may create a potential difference in performance between the portfolio and the index. Portfolio manager will therefore tend to hold the index, and may under or overweight certain shares in the attempt to outperform the index.

Further analysis on share price reveals that the abnormal return at announcement date is not permanent (i.e. the share prices back to its equilibrium value once the global institutional investors have rebalanced their portfolio), thus the evidence supports the price pressure hypothesis.

Suggestion for Further Research

Three areas of future research are identified. *First*, empirical evidences tend to show that markets with different financial market development, regulatory framework and market structure may react differently to the same type of event. Since the changes in the MSCI Equity Index cover almost all markets in the world, it is worth investigating the differences in the impact of changes in one particular index (i.e. the MSCI Equity Index) across different countries. Due to time constraints, such effort could not be done in this study.

Second, Surabaya Stock Exchange introduces the LQ 45 Index future on 13th August 2001. The introduction of this index future may give an incentive for investors to do so-called index arbitrage. Jones (2001) defines index arbitrage as exploitation of price differences between stock-index futures and the index of stocks underlying the future contract. For example, if the LQ 45 futures price is too high relative to the LQ 45 index, arbitrageurs could short the future contract and buy the portfolio that mimic the LQ 45 index. The action may lead to the portfolio rebalancing when the composition of the LQ 45 Index changes. Consequently, the changes in the LQ 45 index may have a significant impact on market. With the availability of the data in the future, it may be interesting to compare the market reaction prior to and after the introduction of the LQ 45 Index future.

Third, although the empirical evidence shows that the result of the study of index changes in the United States is unaffected by the crisis period, the nature of the crisis and the capital market development in Indonesia is different from that of USA. Therefore, it is still possible that the result of this study may be distorted by the financial and political crisis in Indonesia. With the availability of the data in the future, it may be important to check the sensitivity of the finding of this study to the crisis in Indonesia.

References

Amihud, Y. and H. Mendelson. 1986. Asset pricing and the bid-ask spread. *Journal of Financial Economics* 17: 223-249.

Anderson, D.R., D.J. Sweeney, T.A. Williams, N.J. Harrison and J.A. Rickard. 1989. *Statististics for Business and Economics* (Australian Editions). Harper Educational.

Beneish, M. and J.C. Gardner. 1995. Information costs and liquidity effects from changes in the Dow Jones Industrial Average List. *Journal of Financial and Quantitative Methods* 1: 135-157.

Beneish, M. and R. Whaley. 1996. An anatomy of "S&P Game:" The effects of changing the rules. *Journal of Finance* 51: 1909-1930.

Bishop, S.R., H.R. Crapp, R.W. Faff and G.J. Twite. 1993. *Corporate Finance*. Sydney: Holt, Rinehart and Winston.

Bonser-Neal, C., D. Linnan, and R. Neal. 1999. Emerging market transaction costs: Evidence from Indonesia. *Pacific-Basin Finance Journal* 7: 101-127.

Campbell, J., A. Lo, and A. MacKinlay. 1997. *The Econometrics of Financial Markets*. New Jersey: Princeton University Press.

Dhillon, U. and H. Johnson .1991. Changes in the Standard and Poor's 500 list. *Journal of Business* 64: 75-85.

Fowler, D.J. and C.H. Rorke. 1983. The risk measurement problem when shares are subjected to infrequent trading. *Journal of Financial Economics* 12: 279-289.

Haris, L. and E. Gurel . 1986. Price and volume effects associated with changes in the S&P 500 list: new evidence for the existence of price pressures. *Journal of Finance* 4: 815-829.

Hartono, J., and Surianto. 2000. Bias in beta values and its correction: Empirical evidence from the Jakarta Stock Exchange. *Gadjah Mada International Journal of Business* 2 (3) (September): 337-347.

Jain, P.C. 1987. The effect on stock prices of inclusion in or exclusion from the S&P 500. *Financial Analyst Journal* (January-February): 58-65

Jakarta Stock Exchange. 2001. Peraturan Indeks LQ 45. http://202.155.2.84/ (accessed April, 3).

Jones, C. P. 1988. *Investments: Analysis and Management*. New York: John Wiley & Sons.

Kaul, A., V. Mehrotra, and R. Morch . 2000. Demand curves for stocks do slopes down: New evidence from index weights adjustment. *Journal of Finance* 2, 893-912.

Liu, S. 2001. Changes in the Nikkei 500: New evidence for downward-sloping demand curves for stocksö. *Forthcoming in International Review of Finance.*

Lynch, A., and R. Mendenhall .1997. New evidence on stock prices effects associated with changes in S&P 500 Index . *Journal of Business* 70: 351-383.

Montgomery, J. 1997. The Indonesia financial system: Its contribution to economic performance and key policy issues. *Working Papers*, IMF.

Morgan Stanley Capital International. 2001. V/G Announcement. http://www.msci.com/announcements/index.html (accessed November 21).

Morgan Stanley Capital International. 2001. MSCI Enchanted Methodology. *http://www.msci.com/provisional/index1.html* (accessed November 21).

Shleifer, A. 1986. Do demand curves for stocks slope down? *Journal of Finance* 3: 579-590.