DOES THE ANNOUNCEMENT OF CHANGES IN THE STATUTORY RESERVE REQUIREMENT PROVIDE RELEVANT ECONOMIC NEWS FOR THE MALAYSIAN STOCK MARKET?

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ABSTRACT

This paper examines the daily response of stock prices to announcements of changes in the statutory reserve requirement (SRR), in Malaysia. To analyze the impact of the announcement of changes in the SRR, the average, mean-adjusted, return (AMAR) and the cumulative, mean-adjusted, return (CMAR) are computed for the Kuala Lumpur Composite Index (KLCI) and the Kuala Lumpur Bank Index for the period 1985-1998. There were fourteen SRR changes. We find that both the KLCI and the Bank Index react to changes in the SRR in a fashion consistent with semi-strong for market efficiency.

INTRODUCTION

Under Section 37(1) of the Central Bank of Malaysia Act of 1958, Bank Negara of Malaysia (BNM) establishes a Statutory Reserve Requirement (SRR) for the banking institutions in the country (BNM, 1999). With the establishment of the SRR, all banking institutions are required to maintain a certain percentage of their deposits with BNM in the form of cash reserves. Because loans and financing come from bank deposits, the introduction of the SRR directly established a constraint on financial institutions and on their lending activities. Furthermore, because economic growth is facilitated by the lending activities of financial institutions, changes in the SRR may have economic implications.

This study focuses on market reaction to the announcement of SRR changes made by the banking authorities. There are three fundamental questions that this study addresses. (1) Do announcements of SRR changes contain relevant economic news and does the stock market react to this information? (2) Assuming that the stock market reacts to the announcement of the SRR changes in general, do such announcements cause the stock market to move in a particular direction? (3) Since changes in the SRR may affect a bank's lending capability, do such announcements cause reactions in banks' stocks. In order to provide an answer to these three questions, an event study is conducted and discussed in this paper.

In previous studies that analyze the impact of economic news on markets, the event methodology hypothesizes that economic news does have valuation implications. Grossman (1981), Urich and Wachtel (1981) and Roley (1983) analyzed the impact of weekly money stock announcements on security returns. These studies find that money stock announcements do create reactions in the market. The market reacts particularly when the announcement indicates an unexpectedly

high money growth rate and the reaction of the stock market is negative. Feldstein (1980) and Summers (1981) study the relationship between inflation announcements and stock returns. Both studies find that stock return changes are negative when the announcements indicate an unexpected hike in the inflation level. Pearce and Roley (1985) study the response of the stock market to news of real economic activities. However, Pearce and Roley find no relationship between the inflation announcements and the stock market. Waud (1970) and Jensen and Johnson (1995) analyze the impact of discount rate change announcements. Both papers report that there are some reactions in the stock market due to these announcements.

Using data of Malaysian stock markets, this paper adds to the existing literature of economic news announcement and the impact on stock prices by examining an additional type of economic news - *statutory reserve requirement (SRR) change announcements.* We are analyzing the impact of a specific economic event on stock prices.

Past studies on the impact of statutory reserve requirement (SRR) change announcements, focus on the impact of these announcements on bank stocks, Kolori, Mahajan, and Saunders (1988), Osborne and Zaher (1992), and Slovin, Sushka, and Bendeck (1990). None of these studies attempt to relate the announcement's impact with the stock market as whole with the exception to the study by Slovin, Sushka, and Bendeck (1990). Part of the reason why these studies focus on bank stocks only has to do with the data and the country sample. All of these studies used the American economy as their country sample. In America, even though the SRR is one of the tools used by the FED in an instrument of monetary policy, changes is the SRR in the United States occur less often than changes in the discount rate.

In Malaysia however, the SRR is the oldest and the main tool used by the Bank Negara of Malaysia in their implementation of monetary policy (BNM, 1999). Since the SRR is the major tool in the implementation of monetary policy, and such implementation would have a direct effect on the economy and real activity as a whole, a study of the relationship between SRR change announcements and the stock market is very much warranted. This study is carried out to provide such evidence. Therefore, unlike previous studies, this study will extent the analysis by looking not just at the effect the SRR change announcements have on bank stocks but by looking at how the stock market as a whole reacts to such announcements. Another contribution of this study lies in the data sample. Instead of using stock market data from developed market, we use stock market data from a developing market. If the stock market of Malaysia is found to capture the information of such announcements, then this study will add to the literature on semi-strong form market efficiency.

THEORETICAL BACKGROUND AND HYPOTHESIS DEVELOPMENT

In principle, the SRR can be used as a monetary policy tool to control the money supply, prices, interest rates, and output (Fama, 1983 and Friedman, 1984). In this sense, the SRR and discount rate are somewhat similar in terms of their functions. Jensen and Johnson (1995) and Smirlock and Yawitz (1985) explain that the changes in the discount rate that the FED charges to those financial institution that come to the FED for loans will alter the lending pattern of the financial institutions. Changes on the lending pattern affect liquidity in the economy which affects real activity in the economy. If we assume that the stock market is semi-strong form efficient, the stock market captures all information about real economy activities. Hence, changes in economy growth due to changes in the discount rate lead to changes in the stock

188

market in the form of stock market reactions. Fama (1983) and Friedman (1984) posit that SRR changes can be used to implement a country's monetary policy and the SRR and the discount rate serve similar functions. Unlike the FED in the United States, the SRR is the main monetary policy tool for BNM. We hypothesize that announcements of changes in the SRR cause a reaction in the Malaysian stock market.

Jensen and Johnson (1995), Waud (1970), and Smirlock and Yawitz (1985) find that an announcement of a decrease in the discount rate causes a positive reaction in the stock market. An announcement indicating an increase in the discount rate causes a negative reaction. The possible explanation as to how such changes in the discount rate (announcements) can impact equity prices is as follows. An increase (decrease) in discount rate that the FED charges causes the financial institutions to reduce (increase) lending activities. The changes in the bank lending activities effect growth in the economy. For instance, greater lending activities allow for more business financing and that leads to increased economy growth. However, lower lending activities reduce business financing and this reduction leads to economic contraction. Because the value of a firm's shares depends on future cash flows generated from the firm's business activities, an increase in a firm's cash flow should increase the share price, Jensen and Johnson (1995). A decrease in a firm's cash flow should lower the firm's share value.

Another explanation as to why an increase or decrease in the discount rate may create an opposite effect on the stock price has to do with the interest rate forecast, Smirlock and Yawitz (1985). From the above discussion, when the FED announces an increase in the discount rate, the immediate reaction of the financial institution is to reduce lending activity. When there are fewer loans available in the economy, then a constant demand for loans relative to the reduced supply of loans causes the price of a loan, the interest rate, to increase. Because the interest rate is the rate being used to discount all of the firm's cash flows in the share valuation process, a higher interest rate leads to a higher discount rate which lowers share value. Alternatively, a lower interest rate increases share values in general.

Based on these two explanations and because changes in the SRR, just like changes in the discount rate, may directly impact bank lending, Slovin, *et. al.* (1990) as well as on the interest rate, Fama (1983) and Friedman (1984), we suggest the following hypotheses: (1) An announcement of a reduction in the SRR will lead to positive reaction in the Malaysian stock market and (2) an announcement of an increase in the SRR will create a negative reaction in the stock market.

The second objective of this study has to do with the wealth effect of bank reserve requirement change announcements on banks stocks. Based on the findings of Slovin, *et. al.* (1990) an increase in the SRR creates an excise tax on banking activities. An increase in the SRR limits a bank's ability to create loans. Since loans are a bank's major source of income, an increase in the SRR affects a bank's profitability and a bank's shares value. As a result, when the announcement pertains to an increase in the SRR, a bank's stock reacts negatively. A reduction in the SRR increases a bank's ability to create loans. Such expansion increases profitability and eventually has a positive effect on a banks share price. If we assume Malaysian banks respond in the same way to changes in the SRR, we hypothesize that a bank's stock will react negatively to the announcement of an SRR increase and positively to the announcement of an SRR reduction.

189

RESEARCH DESIGN

We examine all SRR announcements between 1985 and 1998. The sample contains 14 SRR changes, 10 increases and 4 decreases. In order to capture the influence of SRR announcements, we use two stock market indices. The indices are the Kuala Lumpur Stock Exchange Composite Index (KLCI) and the Malaysian Banks Index. The Bank Index used in this study was constructed by the Dow Jones Industry Averages and the data were obtained from Datastream services. We use the KLCI to gauge the performance of the stock market as a whole with respect to the announcement of SRR changes and we use the Banks Index to analyze the impact of the SRR announcements on banks stocks.

The event window to analyze the stock returns changes in this study are the 15 days before and the 15 after a two-day announcement period. A two-day announcement period has been chosen for this study in order to account for a late announcement of the change in the SRR, Othman Yong (2001).

We test for the reaction of the stock market to SRR announcements by examining mean–adjusted returns (MAR). The MAR technique is used in Jensen and Johnson (1995) to evaluate the impact of announcements of changes in discount rate, one of the main FED monetary policy tools, on the US stock market. The method we use to compute the MAR (residuals) is as follows:

$$\textbf{MAR}_{\textbf{i,t}} = R_{i,t} - R_{mean}$$

where, $R_{i,t}$ is the index return on event day **'t'** of the rate change period **'i'** and R_{mean} is the mean daily return over the 1985 – 1998 period.

In this study, we do not attempt to determine the effects of SRR changes for an individual time period. Rather we are concerned with whether the process of SRR changes in *general* is associated with specific types of return behavior of the stock market. As mentioned in Fama, *et. al.* (1969), "to abstract from the eccentricities of specific cases we can rely on simple process of averaging, we shall therefore concentrate attention on the behavior of *cross-sectional averages* of estimated regression residuals in the months surrounding split dates." Following the guideline proposed by Fama, *et. al.* (1969), we compute the average of the residuals MAR (AMAR) as follows:

$$\textbf{AMAR} = (\Sigma R_{i,t} - R_{mean}) \, / \, (Nm)$$

where, N_m is the number of SRR change announcements considered and in this study, N_m is equal to 14. Our principle tests will involve examining the behavior of AMAR for the interval from –15 to +15 days surrounding the announcement of the SRR.

We examine the cumulative effects of the AMAR in days surrounding the SRR announcement. The cumulative average mean adjusted returns are calculated as:

$$\textbf{CMAR}_{\textbf{i,(s,e)}} = \Sigma (R_{i,t} - R_{mean})$$

The average residual MAR (AMAR) can be interpreted as the average deviation of the stock returns from their normal mean daily value. This deviation is supposedly due to an event that is economically relevant in determining the value of stocks, Fama, *et. al.* (1969). Similarly, the cumulative average mean adjusted returns (CMAR) can be interpreted as the cumulative deviation from day –15 to 15. In other

words it shows the *cumulative* effects of the wanderings of the stocks returns from their normal relationship to their normal mean daily value.

TABLE 1
STATISTICAL SIGNIFICANCE TEST ON AVERAGE MEAN ADJUSTED RETURN (AMAR)
KLCI AND BANK INDEX CENTERED AROUND THE SRR ANNOUNCEMENT DATE
FULL SAMPLE – COMBINED

Panel A			Panel B	
KLCI	**t-test**	**Day**	**Bank index**	**t-test**
0.0098	0.411	-15	0.0022	0.002
-0.0036	-1.148	-14	-0.0043	-0.534
0.0022	-0.481	-13	-0.0018	-0.329
-0.0067	-1.513	-12	-0.0030	-0.424
-0.0044	-1.250	-11	-0.0049	-0.586
0.0007	-0.652	-10	0.0093	0.592
0.0181	1.374	-9	0.0393	3.066
0.0046	-0.201	-8	0.0178	1.296
0.0029	-0.393	-7	0.0196	1.440
-0.0040	-1.205	-6	-0.0088	-0.905
0.0002	-0.710	-5	0.0099	0.642
0.0032	-0.366	-4	-0.0020	-0.344
0.0003	-0.700	-3	-0.0072	-0.770
-0.0043	-1.232	-2	0.0010	-0.091
-0.0038	-1.182	-1	-0.0039	-0.499
-0.0169	-2.704	0	-0.0181	-1.890
0.0172	1.275	1	0.0173	1.249
0.0083	0.231	2	0.0107	0.707
0.0108	0.530	3	0.0104	0.679
0.0114	0.595	4	0.0183	1.332
-0.0163	-2.628	5	-0.0127	-1.230
-0.0003	-0.769	6	0.0032	0.089
-0.0083	-1.697	7	-0.0156	-1.464
-0.0016	-0.917	8	-0.0101	-1.011
0.0187	1.450	9	0.0162	1.159
0.0008	-0.646	10	-0.0022	-0.361
0.0025	-0.438	11	-0.0030	-0.426
-0.0062	-1.461	12	-0.0054	-0.622
0.0000	-0.736	13	0.0051	0.240
-0.0081	-1.677	14	-0.0021	-0.349
-0.0031	-1.091	15	-0.0027	-0.403
0.0014	-0.576	16	-0.0036	-0.474

191

TABLE 2
STATISTICAL SIGNIFICANCE TEST ON AVERAGE MEAN ADJUSTED RETURN (AMAR)
KLCI CENTERED AROUND THE SRR ANNOUNCEMENT DATE
SPLIT SAMPLE TEST

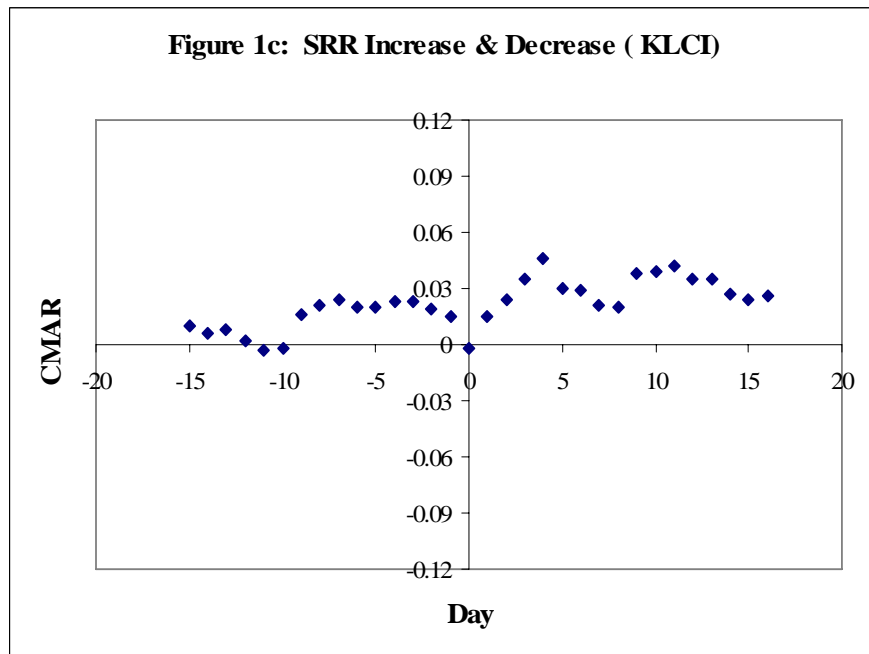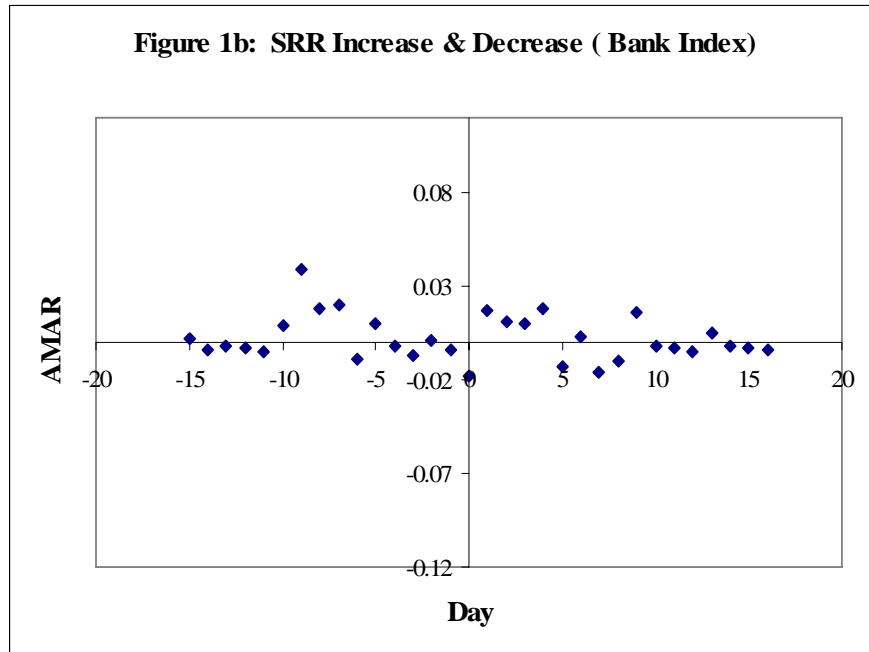| Panel A			Panel B	
SRR Decrease	**t-test**	**Day**	**SRR Increase**	**t-test**
0.0079	0.267	-15	0.0108	2.0429
-0.0207	-1.025	-14	0.0050	0.9317
0.0034	0.063	-13	0.0016	0.2618
-0.0286	-1.382	-12	0.0043	0.7895
-0.0152	-0.776	-11	0.0010	0.1462
0.0075	0.250	-10	-0.0027	-0.5622
0.0533	2.312	-9	0.0005	0.0602
0.0140	0.543	-8	-0.0002	-0.0687
0.0055	0.157	-7	0.0016	0.2801
-0.0111	-0.589	-6	-0.0005	-0.1416
-0.0022	-0.189	-5	0.0014	0.2319
0.0121	0.455	-4	-0.0013	-0.2906
-0.0048	-0.306	-3	0.0028	0.5072
-0.0151	-0.772	-2	0.0011	0.1829
-0.0127	-0.663	-1	0.0006	0.0732
-0.0273	-1.322	0	-0.0117	-2.2963
0.0431	1.856	1	0.0043	0.7900
0.0166	0.656	2	0.0041	0.7619
0.0402	1.722	3	-0.0038	-0.7750
0.0375	1.602	4	-0.0017	-0.3570
-0.0485	-2.279	5	-0.0001	-0.0622
0.0200	0.810	6	-0.0104	-2.0488
-0.0115	-0.607	7	-0.0067	-1.3259
0.0029	0.041	8	-0.0038	-0.7736
0.0242	1.000	9	0.0160	3.0541
0.0007	-0.058	10	0.0008	0.1115
0.0047	0.123	11	0.0014	0.2419
-0.0093	-0.509	12	-0.0047	-0.9485
-0.0008	-0.124	13	0.0003	0.0290
-0.0197	-0.981	14	-0.0023	-0.4767
-0.0089	-0.493	15	-0.0001	-0.0624
0.0068	0.218	16	-0.0014	-0.3065

TABLE 3
STATISTICAL SIGNIFICANCE TEST ON AVERAGE MEAN ADJUSTED RETURN (AMAR)
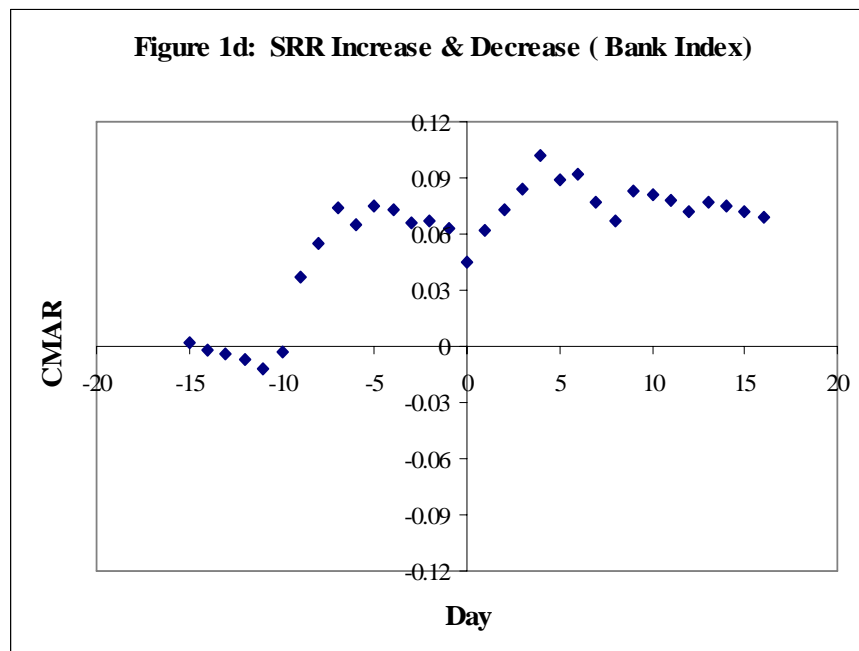**BANK INDEX CENTERED AROUND THE SRR ANNOUNCEMENT DATE**
SPLIT SAMPLE TEST

Panel A			Panel B	
SRR Decrease	t-test	Day	SRR Increase	t-test
-0.0147	-0.5489	-15	0.0089	1.337
-0.0115	-0.4664	-14	-0.0015	-0.284
-0.0192	-0.6645	-13	0.0051	0.741
-0.0097	-0.4204	-12	-0.0003	-0.104
-0.0195	-0.6740	-11	0.0009	0.083
0.0445	0.9755	-10	-0.0048	-0.798
0.1352	3.3105	-9	0.0009	0.087
0.0577	1.3140	-8	0.0019	0.243
0.0529	1.1911	-7	0.0063	0.925
-0.0336	-1.0361	-6	0.0011	0.117
0.0335	0.6911	-5	0.0005	0.023
-0.0081	-0.3796	-4	0.0004	0.011
-0.0279	-0.8885	-3	0.0011	0.116
0.0067	0.0020	-2	-0.0012	-0.246
-0.0151	-0.5588	-1	0.0006	0.035
-0.0173	-0.6176	0	-0.0184	-2.924
0.0418	1.7900	1	0.0075	1.112
0.0257	0.4899	2	0.0047	0.683
0.0382	0.8129	3	-0.0008	-0.174
0.0691	1.6098	4	-0.0021	-0.378
-0.0607	-1.7338	5	0.0064	0.949
0.0437	0.9556	6	-0.0130	-2.084
-0.0326	-1.0107	7	-0.0088	-1.424
-0.0207	-0.7049	8	-0.0058	-0.967
0.0159	0.2397	9	0.0163	2.489
-0.0086	-0.3936	10	0.0004	0.000
-0.0165	-0.5966	11	0.0024	0.319
-0.0128	-0.5005	12	-0.0024	-0.433
0.0027	-0.1006	13	0.0060	0.881
-0.0099	-0.4256	14	0.0010	0.107
-0.0177	-0.6279	15	0.0033	0.456
0.0009	-0.1477	16	-0.0054	-0.897

EMPIRICAL RESULTS

The most important empirical results of this study are summarized in Table 1, Table 2, and Table 3 and in Figure 1, Figure 2, and Figure 3. Table 1 and Figure 1 present the average mean-adjusted returns (AMAR) and cumulative mean adjusted return (CMAR) for the KLCI and the Bank Index when the effects of announcements of SRR changes are analyzed together. The results shown in Table 1 and in Figure1 enable an analysis of the research question presented in Hypothesis 1 that a decrease in the SRR will lead to an increase in the KLCI. Table 2 and Figure 2 present the average mean-adjusted returns (AMAR) and the cumulative mean adjusted return (CMAR) for the KLCI when the effects of SRR positive and negative SRR changes are analyzed separately. These results allow us to address the research questions presented in Hypothesis 2, an increase in the SRR will lead to a decrease in the LKCI. Finally, Table 3 and Figure 3 present the average mean-adjusted returns (AMAR), cumulative mean adjusted return (CMAR) for the Bank Index when the effect of SRR changes are analyzed separately (increases and decreases). Hypothesis 3 is that an increase (decrease) in the SRR will lead to a decrease (increase) in the Bank Index. These results allow us to answer the research question proposed in Hypothesis 3.
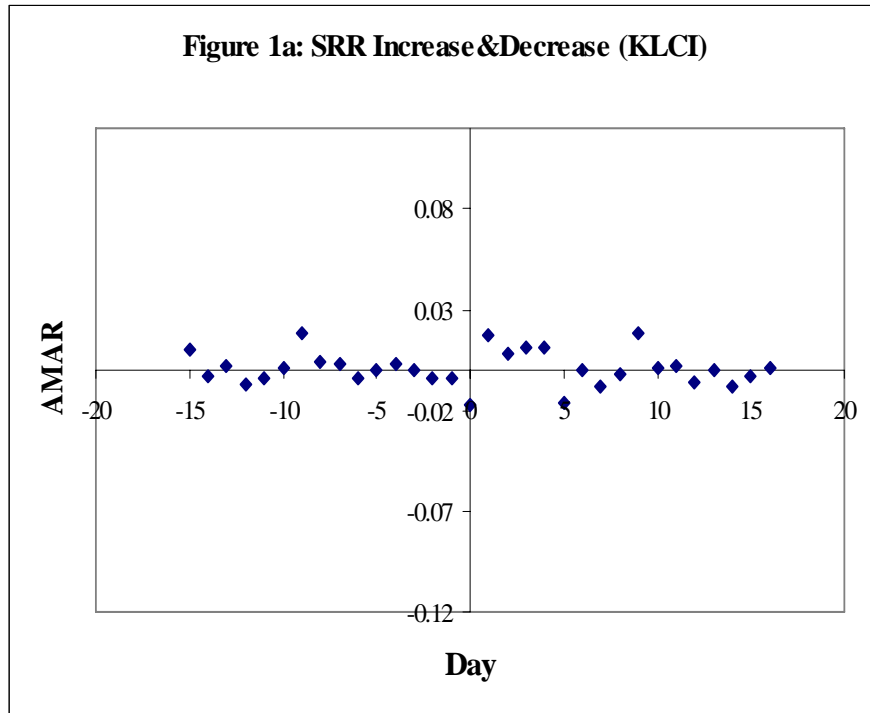
Figure 1a: SRR Increase &Decrease (KLCI)

Figure 1b: SRR Increase & Decrease (Bank Index)

Figure 1c: SRR Increase & Decrease (KLCI)

195

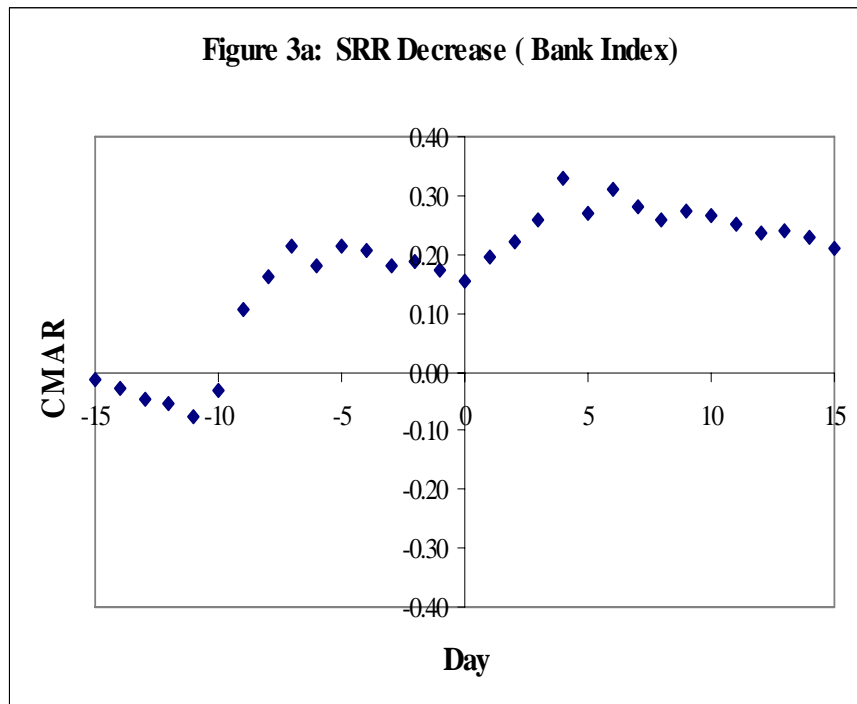**Figure 1d: SRR Increase & Decrease (Bank Index)**

This paper examines the daily response of stock prices to announcements of changes in the SRR. To analyze the impact of the announcement of changes in the SRR, AMAR and CMAR are computed for the KLCI and the Bank Index. From the empirical results obtained from this analysis, we would like to draw several conclusions.

First, the behavior of the residual AMAR before and after the announcement of a change in the SRR is consistent with semi-strong form market efficiency. The AMAR is statistically different from zero on the announcement date of a change in the SRR but generally does not deviate from zero on other days except day minus nine. This pattern is consistent with the semi-strong form market efficiency hypothesis with the exception of day minus nine which provides a statistically significant residual for both the KLCI and the Bank Index. Based on the reaction of the AMAR, it seems that that the announcement of changes in the SRR is relevant information in the stock market and the stock market anticipates the announcement of changes in the SRR.

Second, the KLCI moves in accordance with the direction of an announcement of changes in the SRR. In theory, a decrease in SRR should lead to an increase in the KLCI and an increase in the SRR should lead to a decrease in the KLCI. The results obtained in the study support the hypothesis that the theory suggestions. The KLCI increases in anticipation of a decrease in the SRR and decreases in anticipation of an increase in the SRR. The CMAR increases in anticipation of a decrease in the SRR beginning at day minus nine for the KLCI. The AMAR is statistically significantly negative on day zero in response to an announcement of an increase in the SRR. However, the CMAR indicates the KLCI reacts positively (negatively) prior to an announcement of a decrease (increase) in the SRR.
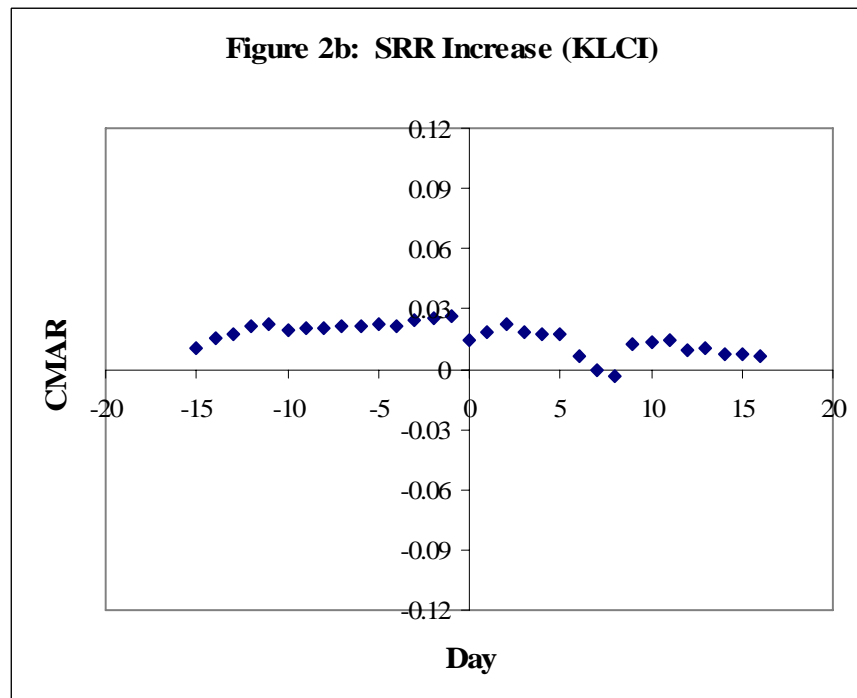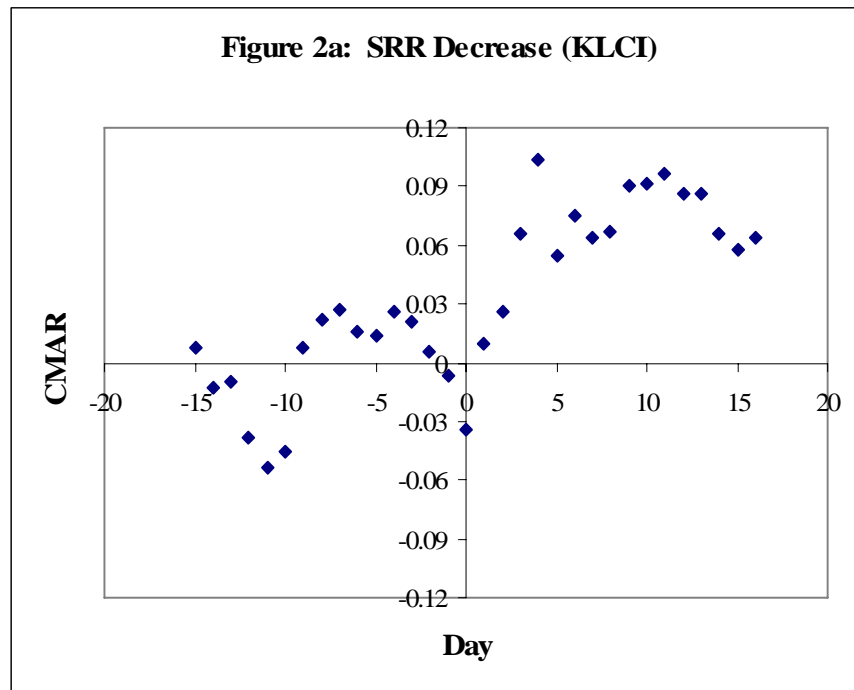
196

Figure 2a: SRR Decrease (KLCI)

Figure 2b: SRR Increase (KLCI)

Third, we find that bank stocks react to the announcement of changes in the SRR. We propose this reaction is because changes in the SRR directly influence a bank's ability to provide loans. Since loans are the main source of cash flow (income) for banks and affect value for the shareholder, changes in the SRR affect share value. The Bank Index increases in anticipation of decrease in the SRR beginning with day minus nine and decrease on day zero for and announcement of an increase in the SRR. The CMAR of banks increases as a result of an announcement of a decrease in the SRR and decreases in reaction to the announcement of an increase in the SRR. The pattern of the Bank Index CMAR provides evidence to support the theory proposed regarding the impact of announcements of a change in the SRR on bank cash flows.

Figure 3a: SRR Decrease (Bank Index)

Figure 3b: SRR Increase (Bank Index)
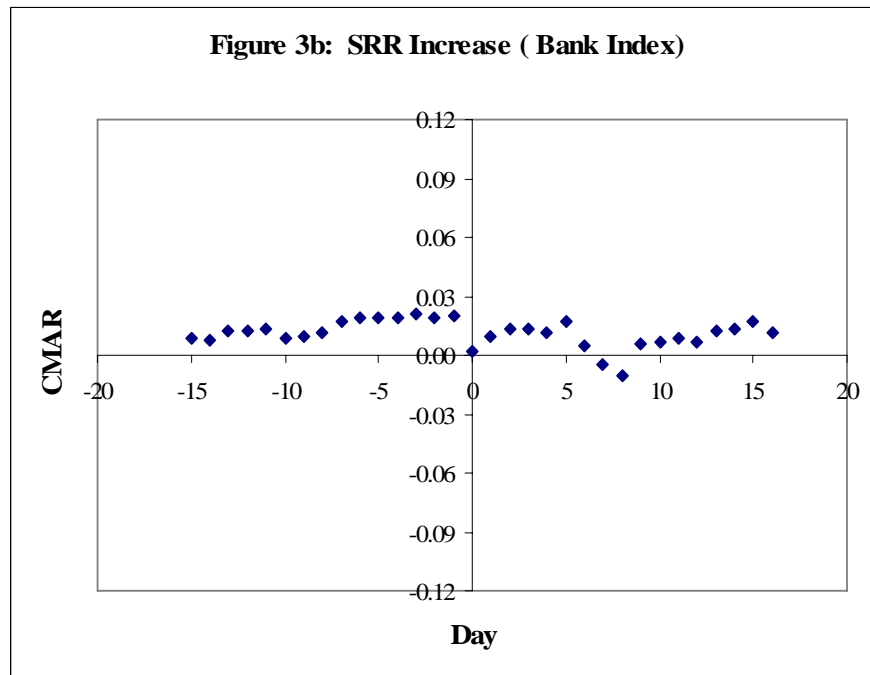
SUMMARY AND CONCLUSIONS

      This paper examines the daily response of stock prices to announcements of changes in the statutory reserve requirement (SRR) in Malaysia on the KLCI (Kuala Lumpur Composite Index) and the Bank Index of the KLCI. To analyze the impact of the announcement of changes in the SRR, the average, mean-adjusted, return (AMAR) and the cumulative, mean-adjusted, return (CMAR) are computed for the KLCI and the Kuala Lumpur Bank Index.

      We draw several conclusions from our empirical results. First, the behavior of the residual AMAR before and after the announcements tends to be different. The AMAR seems to hover around the value of zero for most days before the announcement except for day minus nine. This pattern is consistent with the semi-strong form market efficiency hypothesis in that the market anticipates changes in the SRR. Based on the significant reaction of the AMAR, it seems that that the announcement of changes in the SRR is relevant information in the stock market and the stock market reacts to the announcement of changes in the SRR. Second, the market moves in accordance to changes in SRR. In theory, a decrease in SRR should create a positive reaction in the market whereas a reduction in the SRR should create a negative reaction. The results obtained in the study, support the hypothesis that the theory suggestions. The CMAR increases when the announcement pertains to an announcement of a reduction in the SRR and the CMAR decreases when the announcement pertains to an increase in the SRR.

      Third, we find that bank stocks react to the announcement of changes in the SRR. We propose this reaction is because changes in the SRR directly influence a bank's ability to provide loans. Since loans are the main source of cash flow (incomes for banks) and affect value for the shareholder, changes in the SRR affect

199

share value. The CMAR of banks increases as a result of an announcement of a reduction in the SRR and decreases when the announcement is of an increase in the SRR. The pattern of the Bank Index CMAR provides evidence to support the theory proposed regarding the impact of announcements of a change in the SRR on bank cash flows.

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