

The Impact of Stock Market Liberalization and Macroeconomic Variables on Stock Market Performances

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Abstract. The purpose of this paper is to explore the effects of subsequent stock market liberalizations on stock market performances in ASEAN-3: Malaysia, Thailand and Indonesia. The effects are analyzed with and without the inclusion of macroeconomic variables. Subsequent stock market liberalization is defined as the percentage change in foreign ownership of local equities from 1997. This study also explores the effects of macroeconomic factors: exchange rates, interest rates and oil prices, on stock market performances. Univariate and multivariate regression analyses are carried out and empirical findings support two conclusions: firstly, subsequent stock market liberalization policies implemented in and after 1997 are not significantly effective in improving stock market performances of liberalizing countries; and secondly, macroeconomic variables have significant impact on the performances of liberalizing countries' stock markets in some of these events. The study focuses on the impact of subsequent stock market liberalizations instead of the first stock market liberalization.

Keywords: IAPM, macroeconomics, market liberalization, and market performances

1. Introduction

There is a need for Asian countries, specifically ASEAN, to strengthen its equity market, promote financial stability and create economic and political balance in line with EU and NAFTA of the developed country regions. In order to do so, ASEAN countries need to strengthen financial cooperation among member countries and cross-border activities within the region also need to be improved. One of the ways to improve cross-border activities is by removing legal or informal restrictions. Specifically, it is the government's decision on the removal of legal or informal restrictions on capital flows [1], which is termed stock market liberalization. Stock market liberalization, the main focus of this paper, would theoretically allow greater capital inflows, which in return improve the performances of the liberalizing countries' stock markets in the region.

Based on the theoretical prediction of standard International Asset Pricing Model (IAPM), the liberalization of foreign ownership on local equities would increase the equity price index of emerging markets and therefore results in an increase in equity market returns. Such result is expected due to an increase in efficiency and a decrease in the cost of equity capital upon the openness of the local equities to foreign investors. An increase in net capital inflows would reduce the risk-free rate, increase the stock market liquidity and facilitate risk sharing. Studies that analyse the impact of stock market liberalization find that their results are consistent with the prediction of the model [1], [2], [3].

This paper aims to investigate whether subsequent stock market liberalization would generate consistent results as the prediction of the model. Subsequent stock market liberalization is defined as liberalization that takes place after the first stock market liberalization. It is normally imposed on specific sector(s) and for a smaller percentage change of foreign ownership. In addition, macroeconomic variables are included in the analyses as controlling variables to further analyze any differences in the impact of liberalization. At the

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same time, the impact of those macroeconomic variables: exchange rate, interest rate and oil price, can be detected.

This paper also contributes to the literature by focusing on subsequent stock market liberalizations that took place from June 1997, the start of Asian financial crisis. This is the time period where many affected countries, especially Malaysia, Thailand and Indonesia, have imposed numerous economic and financial reforms, which include changes in the percentage of foreign ownership on local equities, in order to reduce the impact of the crisis.

The results of the study reveal the effectiveness of stock market liberalization policy and significance of macroeconomic variables in affecting stock market performances. This would assist the ASEAN authorities and other similar developing economies in implementing policy decisions on stock market liberalization and the path to go further in strengthening financial cooperation that may result in stronger capital markets in the region. Authorities would also be able to make decisions on any modification or cancellation of the liberalization process if stock market liberalization policy fails to improve stock markets performances. They would also be able to consider if there is a need to go for tighter global financial regulation as suggested by France and Germany at the recent G20 meeting in April 2009, especially after the 2007 credit crunch.

The objectives of this research are two folds. Firstly, to examine the effects of subsequent stock market liberalization on the performance of stock market indices in ASEAN, specifically: Malaysia, Thailand, and Indonesia. Secondly, to explore the impact of stock market liberalization with the inclusion of macroeconomic variables on stock market performances. The hypotheses include:

- H₁: There is significant relation between stock market liberalization and stock market performances in ASEAN (Malaysia, Indonesia, Thailand and South Korea) countries.
- H₂: There is significant relation between stock market liberalization, macroeconomic variables (exchange rate, interest rate and oil price) and stock market performances.

2. Literature Review

Many previous studies provide evidence on the impact of official liberalization policy announcements, listing of country funds or the establishment of the first American Depository Receipt (ADR) [1]-[3], [5], [6], [9], [10]. Studies compare the results before and after the implementation of the first market liberalization. Moreover, many countries which have already opened up their stock markets to foreign investors need to understand its effects on the domestic economy before deciding whether they should open up more of their markets or reverse the policies. There is therefore a need to focus on the effects of subsequent liberalization of stock markets.

In analyzing the impact of stock market liberalization, numerous researchers focus on the impact of different areas such as real economy, investment, and market integration. In terms of the impact on stock market prices or returns, studies reveal that stock market liberalization imparts positive impact [1], [4], [8], [11], [12], [14]. It is also observed that stock market liberalization is more effective in economies with initially less active stock markets and higher trade costs [13]. On the other hand, liberalization may not improve the efficiency of emerging markets [10]. Indeed, it is also found that liberalization is negatively related to stock market development in the short-run [7].

The macroeconomic variables: exchange rate, interest rate, and oil price, are found to have significant relation with stock market returns [17] but with mixed direction. Instead of being positively related, exchange rate in Malaysia [16] and Nigeria [15] is negatively related to stock market returns. Interest rate is found to be negatively related due to inflationary or discounted factor effect [15], while, Bilson [17] finds it positive. There are also few studies find out that there is no significant relationship between oil price and stock market returns.

3. Methodology

This study focuses on the stock markets and macroeconomic fundamentals of Malaysia, Indonesia, and Thailand from January 1997 to December 2009. Malaysia, Thailand, and Indonesia are the only three

ASEAN emerging countries selected in this study as they were most directly affected by the Asian financial crisis in 1997 relative to others in the region.

This research uses stock market returns as a proxy for stock market performances. The stock market returns are measured by the main indices of individual country's stock exchanges, which are Kuala Lumpur Composite Index (KLCI), Stock Exchange of Thailand (SET) Composite Index, and Jakarta Composite Index (JCI) of the Indonesia Stock Exchange. All data collected are on a weekly basis based on the closing index of the week from DataStream. The weekly market returns of a country's index i at time t are measured as $R_{it} = \ln(P_t) - \ln(P_{t-1})$ (E1), where $\ln(P_t)$ is the natural log of current week price index; $\ln(P_{t-1})$ is the natural log of previous week price index; and R_{it} is the market returns of country i at time t .

Weekly data on the macroeconomic variables for each country are obtained from Bloomberg, CEIC Data, DataStream, International Monetary Fund, individual country's statistical department and central bank. These macroeconomic factors include: foreign exchange rate of local currency per U.S. dollar, three-month interbank offer rate and spot crude oil price of non-OPEC countries in U.S. dollar.

Stock market liberalization is the event when there is a percentage change in foreign ownership of local companies. The implementation dates of the events from 1997 onwards are obtained mainly from Bekaert's and Harvey's data on major political and economic events in emerging markets and Lexis-Nexis as shown in Table 1. The following six major events are systematically analyzed in this study.

Table 1: Implementation Dates of Subsequent Stock Market Liberalization

Country	Date	% Change in foreign ownership	Sources
Malaysia	3 Apr, 1998	49% to 61% for local telephone companies	BH
	1 June, 2003	Extension of 100% for manufacturing companies	BH
	18 Apr, 2005	30% to 49% for investment banks	LN
Thailand	13 Oct, 1997	Full ownership in financial institutions for up to 10 years	BH
Indonesia	4 Sep, 1997	49% for IPO and unlimited % for local shares except banks	BH
	31 Mar, 1999	Ceiling raised for nonstrategic corporations & 85% to 99% equity participation of foreign banks	BH

Note. BH is Bekaert's and Harvey's data on major political and economic events in emerging markets. LN is Lexis Nexis data.

The time series variables are transformed by natural logarithm and tested for unit root. The augmented Dickey-Fuller (ADF) and the Phillips-Perron (PP) tests results show that the series are stationary at first difference. Heteroscedasticity is also tested by applying heteroskedasticity-consistent White. Two major models are tested in the study: a) Model 1 on the impact of stock market liberalization on stock market performances where $R_{it} = \alpha_1 + \gamma_1 \text{Lib}_{it} + \varepsilon_{it}$ (E2) and b) Model 2 on the effects of macroeconomic variables and stock market liberalization on stock market performances where $R_{it} = \alpha_3 + \rho_1 \text{Lib}_{it} + \rho_2 r_{it} + \rho_3 i r_{it} + \rho_4 \text{oil}_t + v_{it}$ (E3).

In order to measure stock market performances surrounding the stock market liberalization events, a fifty-three (53) trading week event window is analyzed with 26 weeks prior to and 26 weeks after the implementation week T^* . The event time T^* denotes the implementation week of subsequent stock market liberalization.

4. Findings

Table 2 portrays the impact of stock market liberalization on stock market performances as in Model 2, equation (E2). The results reveal that stock market liberalization is not associated with stock market performances and the null hypothesis cannot be rejected. The stock market liberalization policy is thus not proven to be effective. The findings from Model 3 with the inclusion of macroeconomic variables in equation (E3) as shown in table 3 found one significant coefficient of stock market liberalization dummy. The significant coefficient belongs to Malaysia's liberalization policy in April 1998. It is interesting to note that the coefficient is negative, which indicates that liberalization initiatives deteriorate performances of the Malaysian stock market. Such declining effect may be due to the exposure of uncertainties abroad especially during the period of contagious financial crisis.

The findings on the impact of liberalization policies on stock market of the three countries are mixed and that liberalization policy may be positively or negatively associated to market performance. If the policy is positively related, then it complies with the Standard International Asset Pricing Model [1]. If the coefficient

is negative, then there is no reason for the authorities to implement such policies since it initiates a downfall of market returns.

Findings from Table 3 portrays that U.S. exchange rates have significant negative relation with the stock market performances of Malaysia and Indonesia in 1998 and 1999. The depreciation of the local currency results in higher cost of capital to firms and this leads to a fall in the performances of these countries' stock markets [15], [16].

Table 2: The Impact of Stock Market Liberalization on Stock Market Performances

	Indo 4-Sep-97	Thai 13-Oct-97	Msia 3-Apr-98	Indo 31-Mar-99	Msia 1-Jun-03	Msia 18-Apr-05
Constant	-0.7644 <i>(0.6625)</i>	-0.8031 <i>(1.4710)</i>	0.0303 <i>(1.8240)</i>	1.6624 <i>(1.3740)</i>	0.1484 <i>(0.3300)</i>	0.0666 <i>(0.2447)</i>
SMLib	0.8092 <i>(1.9536)</i>	0.2314 <i>(1.9600)</i>	-2.3099 <i>(2.1880)</i>	-0.2072 <i>(1.7562)</i>	0.5514 <i>(0.5060)</i>	0.1239 <i>(0.3329)</i>
Adj Rs	-0.0165	-0.0193	0.0030	-0.0193	0.0031	-0.0168
F-Stat	0.1569	0.0140	1.1586	0.0142	1.1625	0.1389

Event window is T-26 to T+26 weeks. T is the implementation week. Regression model as $R_{it} = \alpha_i + \gamma_i Lib_{it} + \epsilon_{it}$, where R_{it} is the market returns of main index of country i at time t ; Lib_{it} is a dummy variable for stock market liberalization. It takes a value of 1, which begins 1 week before the implementation week of stock market liberalization and ends till 26 weeks after the implementation week of stock market liberalization; ϵ_{it} is independently distributed random error term with zero mean and constant variance at time t ; α_i and γ_i are the parameters to be estimated. Data are stationary, heteroskedasticity-consistent (White) standard errors are in italic. *, **, and *** indicate significant difference at 10, 5 and 1 percent levels, respectively.

Table 3: The Impact of Stock Market Liberalization and Macroeconomic Variables on Stock Market Performances

	Indo 04-Sep-97	Thai 13-Oct-97	Msia 03-Apr-98	Indo 31-Mar-99	Msia 01-Jun-03	Msia 18-Apr-05
constant	0.2346 <i>(0.7207)</i>	-0.8810 <i>(1.2624)</i>	0.8420 <i>(1.5353)</i>	1.8400 <i>(1.5212)</i>	0.2146 <i>(0.3351)</i>	0.0288 <i>(0.2612)</i>
SMLiberalization	0.2032 <i>(1.9809)</i>	0.5506 <i>(2.0324)</i>	*-3.5037 <i>(1.7615)</i>	0.8337 <i>(1.6912)</i>	0.4725 <i>(0.5170)</i>	0.2550 <i>(0.3697)</i>
ExchangeRate	-6.3581 <i>(15.9400)</i>	-1.8720 <i>(35.0915)</i>	***-104.9124 <i>(26.5944)</i>	*-41.5669 <i>(23.8197)</i>	-2747.5670 <i>(2276.6800)</i>	-98.9763 <i>(127.7233)</i>
InterestRate	** -15.9450 <i>(7.7327)</i>	**2.2573 <i>(0.9169)</i>	-39.4078 <i>(30.8790)</i>	23.8732 <i>(21.2178)</i>	10.6817 <i>(13.0049)</i>	*87.0450 <i>(48.1510)</i>
Oil Price	19.9178 <i>(31.0544)</i>	16.0249 <i>(29.3675)</i>	-1.0198 <i>(9.9111)</i>	-21.3540 <i>(21.0601)</i>	4.9151 <i>(4.8016)</i>	0.5886 <i>(4.2789)</i>
Adj Rs	0.0125	-0.0505	0.4214	0.0842	-0.0375	-0.0253
F-Stat	1.1615	0.3874	***10.2851	*2.1722	0.5391	0.6850

Time period: T-26 to T+26, Dummy 1: T-1 to T+26; T is the implementation week. Regression model as $R_{it} = \alpha_i + \rho_1 Lib_{it} + \rho_2 \epsilon_{it} + \rho_3 ir_{it} + \rho_4 oil_{it} + v_{it}$, where R_{it} is the market returns of main or sectoral index of country i at time t ; Lib_{it} is a dummy variable for stock market liberalization. Dummy 1: T-1 to T+26; T is the implementation week. ϵ_{it} represents exchange rates of country i at time t ; ir_{it} represents interest rates of country i at time t ; oil_{it} represents oil prices at time t . v_{it} is independently distributed random error term with zero mean and constant variance; $\alpha_i, \rho_1, \dots, \rho_4$ are the parameters to be estimated. Data are stationary, heteroskedasticity-consistent (White) standard errors are in italic. *, **, and *** indicate significant difference at 10, 5 and 1 percent levels, respectively.

There is also evidence that there is significant relation between interest rate and stock market performances in Table 3. The significant coefficients of interest rates are however shown mixed signs for Indonesia and Thailand during the financial crisis in 1997. Negative relation in Indonesia indicates that the lower the interest rate, the better the performances of Indonesia's stock market in Sept 1997. The opposite is found for Thailand in October 1997 where higher interest rates result in improved stock market performances. Based on investment theory, the lower the interest rate, the higher the investment returns, which is due to lower cost of fund [15]. However, if such higher interest rate is followed by an increase in money supply backed by foreign reserves, then domestic investment and consumption would increase which generate better stock market performances [17].

A change in oil prices is not significant in affecting stock market performances in all six events. There is no evidence to reject the null hypothesis where there is no significant relation between oil prices and stock market performances. There seem to be mix relation between oil price and stock market performances across the events and countries. Oil price theoretically, should be negatively related to stock market performances of oil importing countries [15]. Nevertheless, due to the nature of oil exports in Indonesia and Malaysia, the effects may have been cancelled out.

5. Discussion and Conclusion

The insignificant findings of subsequent stock market liberalizations of these three ASEAN counties may be due to the smaller adjustment in percentage change of foreign ownership on local equities or the imposition of stock market liberalization on a specific sector(s) only. The impact of such subsequent stock

market liberalization is not as great as the impact of the initial stock market liberalization. These impacts may have already been anticipated at the time of the first stock market liberalization where the rise in equity price index is only during the announcement or implementation of the first stock market liberalization [1]. If this is true, it clarifies that subsequent stock market liberalizations would not be able to improve the performances of these stock markets since the impact has already been factored in since the first liberalization of the market.

Government authorities in emerging countries, especially ASEAN, are therefore recommended not to focus too much of their attention on the implementation of subsequent stock market liberalization due to its ineffectiveness. The effect of the subsequent policy changes is not found to be statistically significant and therefore these changes do not bring about the desired effect. Other measures such as trade liberalization and other financial reforms may be more effective in strengthening a country's equity market.

6. References

- [1] P. Henry. Stock market liberalization, economic reform, and emerging market equity prices. *The Journal of Finance*. 2000, 55: 529-564.
- [2] C. Tai. Market integration and contagion: Evidence from Asian emerging stock and foreign exchange markets. *Emerging Markets Review*. 2007, 8: 264–283.
- [3] S. Iwata & S. Wu. Stock market liberalization and international risk sharing. *Journal of International Financial Markets, Institutions and Money*. 2009, 19: 461-476.
- [4] K. H. Bae, K. B. Chin, and A. B. Ng. Investability and return volatility. *Journal of Financial Economics*. 2004, 71: 239-263.
- [5] A. Z. Baharumshah, T. Sarmidi, and H. B. Tan. Dynamic linkages of Asian stock markets: An analysis of pre-liberalization and post-liberalization eras. *Journal of the Asia Pacific Economy*. 2003, 8: 180–209.
- [6] G. Bekaert, C. Harvey, and C. Lundblad. Equity market liberalization in emerging markets. *Federal Reserve Bank of St Louis Review*. 2003, 53-75.
- [7] S. B. Naceur, S. Ghazouani, and M. Omran. Does stock market liberalization spur financial and economic development in the MENA region? *Journal of Comparative Economics*. 2008, 36: 673-693.
- [8] I. Grabel. Assessing the impact of financial liberalization on stock market volatility in selected developing countries. *Journal of Development Studies*. 1995, 31: 903-918.
- [9] D. Hunter. The evolution of stock market integration in the post-liberalization period: A look at Latin America. *Journal of International Money and Finance*. 2006, 25: 795-826.
- [10] H. Kawakatsu, and M. Morray. An empirical examination of financial liberalization and efficiency of emerging market stock price. *Journal of Financial Research*. 1999, 22: 385-411.
- [11] F. B. Kwan, and M. G. Reyes. Price effects of stock market liberalization in Taiwan. *Quarterly Review of Economics and Finance*. 1997, 37: 511-523.
- [12] R. Levine and S. Zervos. Capital control liberalization and stock market development. *World Development*. 1998, 26: 1169-1183.
- [13] K. Manova. Credit constraints, equity market liberalizations and international trade. *Journal of International Economics*. 2008, 76: 33-47.
- [14] D. K. Patro. Stock market liberalization and emerging market country fund premiums. *The Journal of Business*. 2005, 78: 135-169.
- [15] R. Somoye, I. Akintoye, and J. Oseni. Determinants of equity prices in the stock markets. *International Research Journal of Finance and Economics*. 2009, 30: 177-189.
- [16] M. Ibrahim, and A. Hassanuddeen. Macroeconomic variables and the Malaysian equity market a view through rolling subsamples. *Journal of Economic Studies*. 2003, 30: 6-27.
- [17] C. Bilson, T. Brailsford, and V. Hooper. Selecting macroeconomic variables as explanatory factors of emerging stock market returns. *Pacific-Basin Finance Journal*. 2001, 9: 401-426.