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TRADE BLOC, REGIONAL OR GLOBAL FACTOR? MODIFIED ICAPM FOR STOCK PRICING IN AFTA

Hooy Chee Wooi*

Goh Kim Leng**

Faculty of Economics & Administration
University of Malaya
50603 Kuala Lumpur
MALAYSIA

*email: cwhooy@perdana.um.edu.my
**email: klgoh@um.edu.my

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Abstract

The resurgence of trade regionalism might pose a significant influence on the stock market relationship of the member countries. The purpose of this paper is to examine the role of trading bloc effect in modern international asset pricing. For the case of ASEAN-5 (Indonesia, Malaysia, Philippines, Singapore and Thailand), we find that the trading bloc loading factor is able to enhance the explanatory power of the conventional international capital asset pricing model (ICAPM) model. The parameter stability tests suggest that the pricing mechanism in AFTA is generally not stable over time. Using three-year-window rolling estimates, we find that the pricing parameters for AFTA are changing in nature. Evidence indicates stronger trading bloc convergence relative to world convergence in AFTA, with the exception of Singapore. The result is strengthened further with rolling estimates of the ICAPM models that account for time varying conditional volatility. Being the financial center of the region and the most developed market among AFTA members, Singapore is found to have the most stable parameter estimates in the rolling windows and it is also more integrated into the global financial markets than the other countries. The key implication is that exposures to trade regionalism should not be neglected in international asset pricing model. The trading-bloc factor also offers a possible explanation to why emerging markets are generally segmented from the world market.

Keywords: AFTA, integration, trading bloc, ICAPM, GARCH, parameter instability

1. Introduction

The last decade witnessed a surge in trade regionalisms.[1] The signs for further intensity in regionalism can be seen with the enlargement of European Union (EU) with 10 new members, the realization of ASEAN Free Trade Area (AFTA) + 3, namely China, Japan and South Korea, and the resurgence of Free Trade Area of the Americas (FTAA) in the western hemisphere. Many believe that trading bloc formation is cost effective compared to multilateralism. An argument put forth is that trading bloc involves lesser number of participants in the process of liberalization, hence is more efficient in moving towards globalization. Frankel et al. (1995) and Frankel and Wei (1998) foresee that the recent regionalisms are likely to be welfare-improving.

It is widely accepted that a close fundamental alignment is very important for a successful trading agreement. However, real convergence may not always be the pre-condition for a booming bloc. Instead, the trading agreement itself can promote and strengthen the real convergence as well as financial integration among its members. This argument is ground on the experience of western European countries in forming a monetary union (Fratzscher, 2002). The formation of regional trading bloc not only induces intra-trade among the member countries and a higher degree of economic integration, but also stimulates active capital mobilization through FDI and portfolio investment across capital markets.

[1] Among the main developments are the agreement of Mercado Común del Sur (MERCOSUR) in 1991; the formation of Central European Free Trade Area (CEFTA), North American Free Trade Area (NAFTA), ASEAN Free Trade Area (AFTA), SAARC Preferential Trading Arrangement (SAPTA), and the expansion of Australia-New Zealand Closer Economic Relations (CER), all in 1992; the formation of a custom union called Commonwealth of Interdependent States (CIS) by the former Soviet republics in 1995, and the accession of ten new member states to the European Union (EU) in 2004.

This is usually supported by the regulation and policy cooperation in the financial system and the increased likelihood of coordination in monetary and exchange rate policies.

Theoretically, financial integration depends much on the level of trading agreement endorsed. Financial integration in a monetary union is presumably higher than a common market, custom union and a free trade area; while market linkage in a common market is closer than a custom union and a free trade area. A free trade area should have the least financial convergence. In practice, however, a lower level of trading agreement such as free trade area might have a high degree of financial integration compared to a common market agreement if the member markets involved are well developed, liberalized and sufficiently efficient. In the North America Free Trade Area (NAFTA), for example, there are agreements to promote investment flow across national borders. In particular, Article 1109 calls for free and quick transfer of all payments relating to equity transactions including dividends, interests and capital gains. In AFTA as well, the December 1995 ASEAN Summit endorsed in principle the concept of an ASEAN Investment Area (AIA), in which barriers to intra-regional investment would be lowered and subsequently removed, regulations to be liberalized, streamlined, and made more transparent, and incentives to be offered to boost regional investment (ASEAN Secretariat, 2005). Furthermore, if trade diversion outweighs trade creations, even in a lower level of trading regionalism, newly created business activities will bring up economic prosperity of the trading region and further attracts capital inflow from member and non-member countries. The improved liquidity and market depth will help in promoting more efficient equity pricing and encourage a closer financial linkage among the member countries. Thus, financial integration of a trading bloc is highly dependent on the commitment and successfulness of the real convergence among the member countries. Despite these implications, limited attention has been directed to study the impact of trade regionalism on financial market integration or its asset pricing mechanism.

This study intends to investigate the effects of AFTA on stock pricing of the ASEAN-5 countries, namely, Indonesia, Malaysia, Philippines, Singapore and Thailand. The novelty of this study lies in the proposal of a direct modeling of the trading bloc impact using an international asset pricing model (ICAPM). Our empirical analysis also accounts for time varying nature of asset pricing, an issue often overlooked in the early literature of stock market linkages. The contribution of this paper is threefold. First, we show that the international asset pricing model with a trading bloc factor has a higher explanatory power than the conventional ICAPM models. Second, the rolling regression technique adopted in this study indicates that the pricing mechanism in a more developed market is far more stable. Lastly, this study offers new evidence that the emerging stock markets of ASEAN-5 have a higher tendency to converge within the trading bloc than to the world market.

The rest of this paper is organized as follows. Section 2 briefly discusses the literature relating to stock–linkage studies that directly and indirectly addressed the trading bloc effect. Section 3 introduces the modified ICAPM model within a trading bloc framework and the methodology for analysis. Section 4 reports the results and Section 5 concludes the paper.

2. Literature Review

The research on stock market interrelationship offers limited evidence on trade regionalism as the existing literature mainly focuses on the issues of portfolio diversification, market liberalization and the contagion effect of the recent East Asian financial crisis.[2] Only a few empirical works addressed the impact of trading bloc. The earliest quest on trading bloc effect was by Lessard (1973). The study investigated diversification opportunity in an Investment Union (a concept parallel to custom union) formed by 4 Latin countries comprising Columbia, Chile, Argentina and Brazil. Using data of 1958-1968 and a multivariate factor analysis, the study documented evidence that the stock markets of the union members are closely related compared with non-member countries.

However, in the following two decades, the impact of trade regionalism on stock market integration was overlooked. The only trading bloc that received continued interest in the literature is the European Community (EC). This is due possibly to the successfulness of the EC bloc in fulfilling their agreement to form EU and also because the markets are developed both in depth and size. Akdogan (1992), for example, found evidence of integration among the EU stock markets. The proportion of systematic risk in their ICAPM model showed an increasing relaxation of capital controls among the EU members. The study is based on monthly data from 1972 to 1990. The result is further supported by Johnson and Soenen (1993) and Johnson et al. (1994) using covariance and correlation analysis on monthly data from 1973 to 1990.

Studies on the impact of other trading blocs are mostly indirect. Soydemir (2000) documented that Mexico was weakly linked to Argentina and Brazil, but more strongly tied with the US. The results revealed the effects of trading bloc membership of these countries, where Mexico is a member of NAFTA, while the other two Latin markets spearheaded the MERCOSUR. Applying weekly data of 1988-1994, the paper concluded that stock market interdependence is a result of economic convergence instead of contagion (Soydemir, 2000: p.174). Knif and Pynnönen (1999) reported that Sweden, Norway and Finland behaved as a Nordic bloc segmented from the three global financial centers (the US, UK, and Japan), and Germany, France, Hong Kong, Switzerland and Denmark, using data of 1993-1996. In another study on Latin countries, Chen et al. (2002) investigated the integration of Argentina, Brazil, Chile, Colombia, Mexico and Venezuela using data for the period 1995-2000. The Johansen cointegration suggests that the six Latin markets shared one long-run equilibrium relationship until 1999. The relationship was largely due to the formation of MERCOSUR trading bloc (Chen et al., 2002: p.1136). The VAR error correction model showed further that the Mexican market has a dominant influence over others, except Colombia. This can be the result of the Mexican membership in NAFTA that contributed to its exogeneity from the MERCOSUR members. The sub-period analysis based on the Asian and Russian crises indicate similar results, but not for the later scenario from 1999 onwards. More recently, Johnson and Soenen (2003) who used the Geweke measures of feedback, found significant simultaneous responses that exist between Canada and Mexico (both NAFTA members) and among Argentina, Brazil, Chile and Peru (the first three are members of MERCOSUR), using daily data from 1988 to 1999. Although they are not direct studies on trading bloc, these works offered some insight on the impact of trade regionalism on stock market integration, at least regionally.

[2] The earliest stock-linkage research aimed to complement the theory of international portfolio diversification, for example, Grubel (1968), Levy and Sarnat (1970) and Lessard (1973). Direct studies on stock market linkages were on track following Gruber and Fadner (1971), Ripley (1973) and Panton et al. (1976). Some researchers found that the asset pricing model offers a useful theoretical coverage for stock market linkages. Versions of the international extension of CAPM include IAPM of Solnik (1974a, 1974b), ICAPM of Lessard (1974, 1976) and IAPT of Solnik (1983). Market liberalization was incorporated in some of the stock-linkage studies beginning early 1980s. Some recent examples are Ayuso and Blanco (2000), Masih and Masih (2002) and Bekaert and Harvey (2003). For the financial crisis, the classical work on contagion effect in stock market linkages is by King and Wahwani (1990). More recent studies include Baig and Goldfajn (1998), Longin and Solnik (2001), Forbes and Rigobon (2002), Baur (2003) and Karolyi (2003) and Bekaert et al. (2004).

3. ICAPM in a Trading Bloc Framework and Methodology

The ICAPM offers a theoretical framework for pricing risky assets under equilibrium market condition. In a fully integrated world financial market where PPP holds, the expected return of a national equity market is solely exposed to the movement in returns of the world portfolio. The pricing of a national equity market in an international setting is determined by the following process:

$$E(R_{it}) - E(R_{Ft}) = \beta[E(R_{Wt}) - E(R_{Ft})]; \quad \forall i$$

or,

$$E(R_{it}) - E(R_{Ft}) = \frac{\text{cov}(R_{it}, R_{Wt})}{\text{var}(R_{Wt})}[E(R_{Wt}) - E(R_{Ft})]; \quad \forall i \tag{1}$$

where R_{it}, R_{Ft}, and R_{Wt} represent the continuously compounded returns of a given market-*i*, world risk free asset and global portfolio, respectively, in time period *t*. Rearranging terms and taking conditional expectation gives the following general specification of the conditional ICAPM:

$$E(R_{it} \mid \Omega_{t-1}) - E(R_{Ft} \mid \Omega_{t-1}) = \delta_{Wt}\,\text{cov}(R_{it}, R_{Wt} \mid \Omega_{t-1}); \quad \forall i \tag{2}$$

where all expectations are taken with respect to the information set, Ω_{t-1}, available at time *t*-1. The expected excess returns of the national stock market-*i* are priced on its covariance with the world market returns R_{Wt}, based on the sensitivity coefficient of δ_{Wt}. The model implies that the expected excess return of a specific country above an international risk-free rate is proportional to the country specific but non-diversifiable risk in the world market portfolio.

Extensions to the one-factor ICAPM stated in (1) are available. Some researchers have decomposed ICAPM into a two-factor model, for example, the mildly segmented ICAPM of Errunza and Losq (1985), the Gold factor ICAPM of Davidson et al. (2003) and the regional ICAPM of Bekaert et al. (2004). Further modifications to multi-factor setting, for example by Campbell and Hamao (1992), coincide with the international arbitrage pricing theory of Solnik (1983). The loading factors in these modifications are proxied by specific local and international macroeconomic factors or stock index of dominant markets, for example the US for the world portfolio or Japan for the Asian portfolio.

In this paper, we include a simple two-factor regional capital asset model, or R-ICAPM given as below:

$$E(R_{it} \mid \Omega_{t-1}) - E(R_{Ft} \mid \Omega_{t-1}) = \delta_{Rt} Cov(R_{it}, R_{Rt} \mid \Omega_{t-1}) + \delta_{Wt} Cov(R_{it}, R_{Wt} \mid \Omega_{t-1}); \ \forall i \tag{3}$$

where R_{Rt} represents the return to a regional portfolio.

In addition, a three-factor model that incorporates the effects of trade regionalism is proposed. Extended from equation (3), this model is specified as:

$$\begin{aligned} E(R_{it} \mid \Omega_{t-1}) - E(R_{Ft} \mid \Omega_{t-1}) &= \delta_{Tt} Cov(R_{it}, R_{Tt} \mid \Omega_{t-1}) + \delta_{Rt} Cov(R_{it}, R_{Rt} \mid \Omega_{t-1}) \\ &\quad + \delta_{Wt} Cov(R_{it}, R_{Wt} \mid \Omega_{t-1}); \ \forall i \end{aligned} \tag{4}$$

where the inclusion of R_{Tt}, the returns to the trading bloc portfolio, provides a new loading factor to capture the effect of the trading bloc whereby the country is a member. This model is henceforth known as the trading bloc ICAPM or TB-ICAPM. If $\delta_{Tt} = 0$, then model (4) collapses to R-ICAPM and if δ_{Rt} is also zero, then the conventional ICAPM holds.

Following the above discussion, a number of different versions of ICAPM can be obtained. Equation (1) provides a testable form of the one-factor ICAPM. For the conventional ICAPM, the following regression is estimated:

$$ER_{it} = \alpha_i + \beta_i^W ER_{Wt} + \varepsilon_{it} \quad (5)$$

where *ER* denotes excess return above the risk free rate, subscript *i* represents the individual market of interest and *W* represents the global market. The single factor model is also estimated for the regional CAPM (denoted as RCAPM),

$$ER_{it} = \alpha_i + \beta_i^R ER_{Rt} + \varepsilon_{,t} \quad (6)$$

and the trading bloc CAPM (denoted as TBCAPM),

$$ER_{it} = \alpha_i + \beta_i^T ER_{Tt} + \varepsilon_{it} \quad (7)$$

where subscript *R* represents the region and *T* represents the trading bloc.

There are three possible combinations of two-factor effect, namely, region and world, trading bloc and world, and, trading bloc and region. The specifications of the two-factor models are as follows:

$$ER_{it} = \alpha_i + \beta_i^R ER_{Rt} + \beta_i^W ER_{Wt} + \varepsilon_{it} \quad \text{(denoted as R-ICAPM)} \quad (8)$$

$$ER_{it} = \alpha_i + \beta_i^T ER_{Tt} + \beta_i^W ER_{Wt} + \varepsilon_{it} \quad \text{(denoted as TB-ICAPM)} \quad (9)$$

$$ER_{it} = \alpha_i + \beta_i^T ER_{Tt} + \beta_i^R ER_{Rt} + \varepsilon_{it} \quad \text{(denoted as TB-RCAPM)} \quad (10)$$

The three-factor ICAPM model incorporates the trading bloc, regional and global effects. The equation, denoted as TB-R-ICAPM, is as follows:

$$ER_{it} = \alpha_i + \beta_i^T ER_{Tt} + \beta_i^R ER_{Rt} + \beta_i^W ER_{Wt} + \varepsilon_{it} \quad (11)$$

All the regressions (5) through (11) are estimated by OLS for each country. By comparing all possible settings, we aim to obtain a better model specification and to show the importance of the trading bloc effects for international asset pricing in different versions of the model. The best setting is selected based on Akaike Information Criterion (AIC) and Schwarz Criterion (SC). The selected model is subject to a series of tests.

The parameter stability is examined using the CUSUM of Squares Test (Brown et al., 1975) and N-step Forecast Test, which are based on the recursive least squares method. The CUSUM of Squares Test plots the recursive residuals against the 5 percent critical lines. Parameter instability is indicated by movements of cumulative sum of squares outside the critical lines. The N-step Forecast Test carries out a sequence of Chow forecast tests. The recursive residuals and its standard errors are displayed together with the p-values for those sample points. The hypothesis of parameter constancy is rejected for points with p-values less 0.05.

One of the most critical limitations in the OLS method of estimation is its inability to account for temporal dependence in unconditional residuals which can be induced by time variation in volatility. Following Ramchand and Susmel (1998), we can correct this problem by re-estimating the selected ICAPM setting using the generalized autoregressive conditional heteroscedasticity (GARCH) model of Bollerslev (1986). In GARCH, the variance of the model is assumed to be time varying, where the error term follows the distribution $\varepsilon_{it} \mid \Omega_{t-1} \sim N(0, \sigma_{it}^2)$. The conditional variance σ_t^2 implies that the residual variance is varying with time factor *t*. The GARCH(*p*, *q*) specification for modeling the conditional variance is given by:

$$\sigma_{it}^2 = \omega_i + \sum_{j=1}^{p} \alpha_{ij} \varepsilon_{i,t-j}^2 + \sum_{m=1}^{q} \beta_{im} \sigma_{i,t-m}^2 \tag{13}$$

where the conditional variance depends on the squared error terms of *p* lags (known as the ARCH effects) and the conditional variance of *q* lags (known as the GARCH effects). The use of GARCH model makes it possible to study the conditional version of ICAPM. The presence of ARCH and GARCH effects in asset prices are well documented in the survey paper by Bollerslev et al. (1992). In this study, the order of *p* and *q* are fixed at one, as this simple specification is sufficient for most empirical modeling purposes (Engle and Ng, 1993). To account for non-normal conditional distribution in the residuals, we use the robust quasi-maximum likelihood method suggested by Bollerslev and Wooldridge (1992). The variance-covariance estimator of this method is heteroscedasticity consistent.

To account for parameter instability, the models are estimated using overlapping windows of three-year horizon. The rolling estimation is for detecting possible structural breaks, particularly as a result of the recent East Asian financial crisis. The pricing estimates of the OLS and conditional time-varying GARCH models are compared. A close similarity between the estimates of these models would suggest that the impact of the loading factors is consistent in both settings. This is especially important to support our thesis on the impact of trading bloc convergence.

The five founder members of ASEAN, namely, Indonesia, Malaysia, Philippines, Singapore and Thailand are considered in this study as their stock markets are more matured than those of the other member countries. In 1977, the Preferential Trading Arrangement that accorded tariff preferences for trade among these ASEAN countries was introduced to promote intra-regional trade. The Framework Agreement on Enhancing Economic Cooperation was adopted in 1992, which included the launching of a scheme toward AFTA in 1992 (ASEAN Secretariat, 2005). The data used in this study are all in monthly frequency, spanning from January 1988 to November 2004. All the data are compiled from Morgan Stanley Capital International (MSCI), except for the global risk free rate, which is proxied by the three-month Treasury bill rates of the US. The bill rates are downloaded from the website of the Federal Reserve Bank. All the stock indices are sourced from the MSCI Country Index. The MSCI indices are free float adjusted, classified in accordance with the Global Industry Classification Standard (GICS). The MSCI All Country World Index, a free float-adjusted market capitalization index designed to measure equity market performance of the developed and emerging markets, is used to compute the returns of global portfolio. The Asian regional portfolio is proxied by the MSCI All Country Asia Index that comprises indices of 12 leading Asian markets. To obtain the returns of trading bloc portfolio for a given country, an equal weighted index return of the remaining four markets is constructed. Given the different influence and exposure of the individual markets, their response to the dynamics of ASEAN stock markets is heterogeneous. The four-country trading bloc index hence makes more sense than the five-country index that includes the local dynamics.

4. Results and Discussion

We conduct the empirical analysis in two stages. In the first stage, we investigate the ICAPM settings stated in equations (5) through (11) using OLS. The best model is selected for each country following the Akaike (AIC) and Schwarz (SC) information criterion. We then proceed to examine the parameter stability of the best model. In the second stage, we estimate the conditional version of the best model by incorporating the time-varying GARCH specification. The window rolling procedure is applied to detect parameter instability following various structural changes in the ASEAN-5 stock markets.

Table 1 presents the descriptive statistics and correlation matrix of the returns in each of the five markets. It is clear that the unconditional distribution of all the series is not normally distributed, as indicated by the Jarque-Bera test which rejects the normality assumption except for the return of the Asia index. The returns of Indonesian stock index have the highest standard deviation while Singapore has the most stable index returns. The returns of the AFTA markets are more volatile compared to the MSCI world index. The strongest correlation in returns is between Malaysia and Singapore. This is followed by Singapore and Thailand, while Indonesia is the most exogenous market among all. Indonesia not only has the lowest correlation with all the AFTA counterparts, but its correlation with the world index is also the weakest. As expected, Singapore has the highest correlation with the Asia and world indices as it has the most developed and liberalized stock exchange among the ASEAN-5.

Table 1 Summary of Descriptive Statistics and Correlation Matrix of Returns

Panel A-Statistics	Indonesia	Malaysia	Philippines	Singapore	Thailand	Asia	World
Mean	0.004	0.004	0.002	0.005	0.002	-0.001	0.005
Std. Dev.	0.149	0.093	0.098	0.073	0.121	0.063	0.042
Skewness	0.422	-0.207	-0.009	-0.478	-0.381	0.002	-0.566
Kurtosis	7.042	6.415	4.609	5.152	4.628	3.468	3.785
Jarque-Bera	144.206	100.091	21.910	46.912	27.319	1.855	16.045
Probability Value	0.000	0.000	0.000	0.000	0.000	0.396	0.000
Observations	203	203	203	203	203	203	203
Panel B-Correlation	**Indonesia**	**Malaysia**	**Philippines**	**Singapore**	**Thailand**	**Asia**	**World**
Indonesia	1.000						
Malaysia	0.479	1.000					
Philippines	0.500	0.549	1.000				
Singapore	0.505	0.658	0.617	1.000			
Thailand	0.466	0.566	0.634	0.655	1.000		
Asia	0.231	0.391	0.348	0.528	0.438	1.000	
World	0.261	0.424	0.409	0.622	0.467	0.785	1.000

Note: Std. Dev. - standard deviation

4.1 OLS Estimates of the ICAPM Models

The results for all the asset pricing models estimated using the full sample observations are presented in Table 2. The trade bloc, regional and world factors are mostly significant in the one-factor models. Note that only the trading bloc factor has coefficient estimates that are significant at the one percent level across the one-, two- and three-factor models. The world factor has significant coefficient estimates but with a higher p-value in all the two-factor models, but only some of the one- and three-factor models. Although the regional factor is significant in the one-factor models, an interesting result is that it becomes insignificant whenever the world factor is incorporated in the other models. The beta magnitudes in the two-factor and three-factor settings suggest that the presence of trading bloc factor overshadows the impact of the world factor, with the exception of Singapore. Overall, the results show that the returns of the ASEAN-5 stock markets are more systematically linked to the returns of world portfolio than the returns of regional portfolio. The regional factor is not as significant as the trading bloc and/or the world factors. The trading bloc factor has a dominant role in the equity pricing of the five markets.

The above findings are further supported by the model selection results, where the two-factor TB-ICAPM model consistently outperforms the other settings, with the exception of Thailand. In these cases, the adjusted R^2 for all the TB-ICAPM models are also the highest compared to the other settings. The trading-bloc factor is able to enhance the goodness-of-fit and explanatory power of the conventional ICAPM model, but the inclusion of the regional factor is not as important. The model selected for Thailand is the two-factor TB-RCAPM. All the selection criteria of the Thai TB-ICAPM, however, are very close to the corresponding value for TB-RCAPM. For the ease of comparison, the analysis will proceed with the use of TB-ICAPM model for Thailand.[3]

Two stability tests are conducted to examine whether the TB-ICAPM parameters have undergone structural changes. The results of the CUSUM of Squares Test and N-step Forecast Test are illustrated in Figure 1. Both the parameter stability tests indicate that the parameters are not stable over time in all the AFTA-5 countries, with the exception of Philippines. The instability in most countries has started since the early 1990s, and persisted up to the period of the 1997 crisis. This suggests that the usual dummy variable approach for handling structural changes and sub-period sample analysis are not suitable. To account for this problem, the estimations in the next section are conducted in rolling windows. Also, while the mean equations in the TB-ICAPM model are correctly specified, the diagnostic results show clearly that the OLS estimations are not sufficient to capture dependence in the squared residuals. The GARCH version of the model is thus necessary.

4.2 Rolling Regression Estimations

To capture the changing dynamics of the loading factors in the international asset pricing model, the rolling procedure is used. The estimated results for the OLS models are provided in Tables 3 to 7. The relative betas of the loading trading-bloc factors are compared to those of the loading world factors. The results show clearly that the pricing to the trading-bloc factor in all the 15 three-year windows are highly significant for all the five countries. This pattern is not observed for the world factor. Singapore is the only country with significant pricing to both the trading-bloc and world factors. The impact of the world portfolio in the other four countries is not significant in many of the three-year windows, especially prior to and during the 1997 crisis windows.

[3] The use of TB-RCAPM for Thailand does not change the conclusion. These results are available on request.

Table 2 OLS Estimation and Diagnostic Checks for ICAPM Models

Indonesia	Constant	AFTA	Regional	World	Q(12)	Q^2(12)	Normality	ARCH LM	F	Adj R^2	AIC	SC
ICAPM	0.001			0.778	24.627	32.905	180.521	4.026	31.378	0.131	-1.040	-1.007
	(0.889)			(0.000)***	(0.017)**	(0.001)***	(0.000)***	(0.000)***	(0.000)***			
RCAPM	0.006		0.621		20.557	28.920	156.448	3.627	27.277	0.115	-1.022	-0.989
	(0.531)		(0.000)***		(0.057)*	(0.004)***	(0.000)***	(0.000)***	(0.000)***			
TBCAPM	0.001	0.937			15.509	40.940	418.920	7.695	119.114	0.369	-1.360	-1.327
	(0.867)	(0.000)***			(0.215)	(0.000)***	(0.000)***	(0.000)***	(0.000)***			
R-ICAPM	0.002		0.170	0.601	23.293	31.813	181.006	3.950	15.871	0.128	-1.032	-0.983
	(0.807)		(0.557)	(0.043)**	(0.025)**	(0.001)***	(0.000)***	(0.000)***	(0.000)***			
TB-ICAPM	0.004	1.147		-0.391	13.693	41.485	374.164	8.270	63.281	0.381	-1.375	-1.326
	(0.679)	(0.000)***		(0.027)**	(0.321)	(0.000)***	(0.000)***	(0.000)***	(0.000)***			
TB-RCAPM	0.001	1.095	-0.266		13.072	41.079	375.583	8.198	62.218	0.377	-1.369	-1.320
	(0.881)	(0.000)***	(0.050)**		(0.364)	(0.000)***	(0.000)***	(0.000)***	(0.000)***			
TB-R-ICAPM	0.003	1.152	-0.070	-0.323	13.359	41.442	370.343	8.314	42.034	0.379	-1.366	-1.300
	(0.708)	(0.000)***	(0.749)	(0.248)	(0.343)	(0.000)***	(0.000)***	(0.000)***	(0.000)***			
Malaysia												
ICAPM	0.000			0.876	31.640	167.200	59.203	7.642	115.337	0.361	-2.105	-2.072
	(0.976)			(0.000)***	(0.002)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***			
RCAPM	0.006		0.705		21.594	113.650	32.372	6.126	98.538	0.326	-2.051	-2.018
	(0.344)		(0.000)***		(0.042)**	(0.000)***	(0.000)***	(0.000)***	(0.000)***			
TBCAPM	0.003	0.747			12.129	82.995	16.221	4.714	263.557	0.565	-2.489	-2.457
	(0.596)	(0.000)***			(0.435)	(0.000)***	(0.000)***	(0.000)***	(0.000)***			
R-ICAPM	0.002		0.222	0.644	26.060	153.060	53.899	7.384	59.162	0.365	-2.106	-2.058
	(0.798)		(0.120)	(0.000)***	(0.011)**	(0.000)***	(0.000)***	(0.000)***	(0.000)***			
TB-ICAPM	0.001	0.632		0.247	14.478	123.060	20.584	6.333	139.751	0.579	-2.516	-2.467
	(0.813)	(0.000)***		(0.017)**	(0.271)	(0.000)***	(0.000)***	(0.000)***	(0.000)***			
TB-RCAPM	0.003	0.646	0.195		16.734	115.290	21.925	5.977	139.419	0.578	-2.515	-2.466
	(0.590)	(0.000)***	(0.008)***		(0.160)	(0.000)***	(0.000)***	(0.000)***	(0.000)***			
TB-R-ICAPM	0.002	0.627	0.100	0.148	15.779	123.570	21.892	6.318	93.247	0.578	-2.510	-2.444
	(0.722)	(0.000)***	(0.402)	(0.382)	(0.202)	(0.000)***	(0.000)***	(0.000)***	(0.000)***			

Table 2 OLS Estimation and Diagnostic Checks for ICAPM Models (continued)

Philippine	Constant	AFTA	Regional	World	Q(12)	$Q^2(12)$	Normality	ARCH LM	F	Adj R^2	AIC	SC
ICAPM	-0.004			1.040	17.229	13.430	2.440	1.062	144.366	0.415	-1.986	-1.953
	(0.550)			(0.000)***	(0.141)	(0.339)	(0.295)	(0.395)	(0.000)***			
RCAPM	0.003		0.799		13.036	6.769	0.256	0.493	105.099	0.340	-1.865	-1.832
	(0.634)		(0.000)***		(0.366)	(0.873)	(0.880)	(0.917)	(0.000)***			
TBCAPM	-0.001	0.894			10.113	25.129	0.121	2.270	329.290	0.619	-2.415	-2.382
	(0.791)	(0.000)***			(0.606)	(0.014)**	(0.941)	(0.011)**	(0.000)***			
R-ICAPM	-0.003		0.087	0.949	16.619	12.645	1.704	0.986	72.086	0.413	-1.977	-1.928
	(0.611)		(0.600)	(0.000)***	(0.164)	(0.395)	(0.427)	(0.464)	(0.000)***			
TB-ICAPM	-0.003	0.732		0.342	10.408	27.965	1.653	2.378	182.228	<u>0.642</u>	<u>-2.472</u>	<u>-2.423</u>
	(0.497)	(0.000)***		(0.000)***	(0.580)	(0.006)***	(0.437)	(0.007)***	(0.000)***			
TB-RCAPM	-0.001	0.792	0.193		9.841	22.971	0.210	1.910	172.397	0.629	-2.437	-2.388
	(0.803)	(0.000)***	(0.006)***		(0.630)	(0.028)**	(0.900)	(0.036)**	(0.000)***			
TB-R-ICAPM	-0.004	0.737	-0.081	0.422	10.547	28.879	2.156	2.497	121.282	0.641	-2.464	-2.399
	(0.432)	(0.000)***	(0.531)	(0.018)**	(0.568)	(0.004)***	(0.340)	(0.005)***	(0.000)***			
Singapore												
ICAPM	0.001			0.948	12.226	101.370	36.305	6.307	293.565	0.592	-2.882	-2.849
	(0.849)			(0.000)***	(0.428)	(0.000)***	(0.000)***	(0.000)***	(0.000)***			
RCAPM	0.007		0.741		12.061	59.878	6.159	5.096	204.807	0.502	-2.684	-2.652
	(0.119)		(0.000)***		(0.441)	(0.000)***	(0.046)**	(0.000)***	(0.000)***			
TBCAPM	0.005	0.675			15.281	23.029	41.912	1.881	411.017	0.670	-3.095	-3.063
	(0.205)	(0.000)***			(0.226)	(0.027)**	(0.000)***	(0.039)**	(0.000)***			
R-ICAPM	0.002		0.138	0.804	10.676	93.288	32.790	6.304	148.372	0.593	-2.882	-2.833
	(0.688)		(0.164)	(0.000)***	(0.557)	(0.000)***	(0.000)***	(0.000)***	(0.000)***			
TB-ICAPM	0.002	0.454		0.503	16.363	47.638	45.667	2.775	329.416	<u>0.765</u>	<u>-3.429</u>	<u>-3.380</u>
	(0.613)	(0.000)***		(0.000)***	(0.175)	(0.000)***	(0.000)***	(0.002)***	(0.000)***			
TB-RCAPM	0.005	0.507	0.345		25.006	40.655	76.921	2.978	283.661	0.737	-3.316	-3.268
	(0.167)	(0.000)***	(0.000)***		(0.015)**	(0.000)***	(0.000)***	(0.001)***	(0.000)***			
TB-R-ICAPM	0.002	0.452	0.040	0.464	17.547	47.577	49.807	2.828	218.899	0.764	-3.421	-3.355
	(0.557)	(0.000)***	(0.615)	(0.000)***	(0.130)	(0.000)***	(0.000)***	(0.001)***	(0.000)***			

Table 2 OLS Estimation and Diagnostic Checks for ICAPM Models (continued)

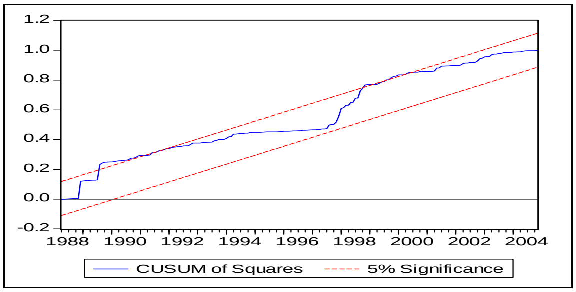
Thailand	Constant	AFTA	Regional	World	Q(12)	$Q^2(12)$	Normality	ARCH LM	F	Adj R^2	AIC	SC
ICAPM	-0.005			1.216	30.032	103.230	10.534	4.376	135.878	0.400	-1.612	-1.580
	(0.538)			(0.000)***	(0.003)***	(0.000)***	(0.005)***	(0.000)***	(0.000)***			
RCAPM	0.003		0.996		18.874	61.432	1.676	3.271	121.346	0.373	-1.568	-1.536
	(0.694)		(0.000)***		(0.092)*	(0.000)***	(0.432)	(0.000)***	(0.000)***			
TBCAPM	-0.002	1.101			16.263	36.122	297.860	3.102	309.758	0.605	-2.029	-1.996
	(0.721)	(0.000)***			(0.180)	(0.000)***	(0.000)***	(0.001)***	(0.000)***			
R-ICAPM	-0.002		0.386	0.814	24.646	86.510	5.621	4.064	71.119	0.410	-1.623	-1.574
	(0.751)		(0.063)*	(0.000)***	(0.017)**	(0.000)***	(0.060)**	(0.000)***	(0.000)***			
TB-ICAPM	-0.004	0.908		0.390	15.154	41.754	148.087	3.378	169.663	0.625	-2.078	-2.029
	(0.450)	(0.000)***		(0.009)***	(0.233)	(0.000)***	(0.000)***	(0.000)***	(0.000)***			
TB-RCAPM	-0.002	0.917	0.339		14.570	44.631	144.553	3.879	172.567	<u>0.629</u>	<u>-2.089</u>	<u>-2.040</u>
	(0.734)	(0.000)***	(0.005)***		(0.266)	(0.000)***	(0.000)***	(0.000)***	(0.000)***			
TB-R-ICAPM	-0.003	0.896	0.248	0.142	14.816	44.698	134.620	3.799	114.994	0.629	-2.082	-2.017
	(0.617)	(0.000)***	(0.116)	(0.471)	(0.252)	(0.000)***	(0.000)***	(0.000)***	(0.000)***			

Note: The White (1980) heteroskedasticity consistent covariance estimates are used to assess the significance of the coefficients. AIC and SC denotes the Akaike and Schwarz values. The underlined value represents the maximum value of Adjusted (Adj) R^2 and the minimum value for both AIC and SC. Figures in the parentheses are p-values. * denotes significance at the 0.10 level; ** denotes significance at the 0.05 level; and *** denotes significance at the 0.01 level.

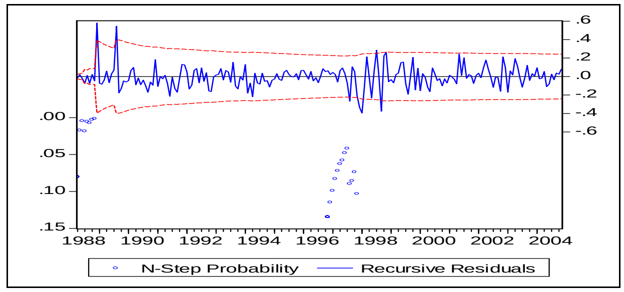
Figure 1: Tests for Parameter Stability

CUSUM of Squares Test	N-step Forecast Test

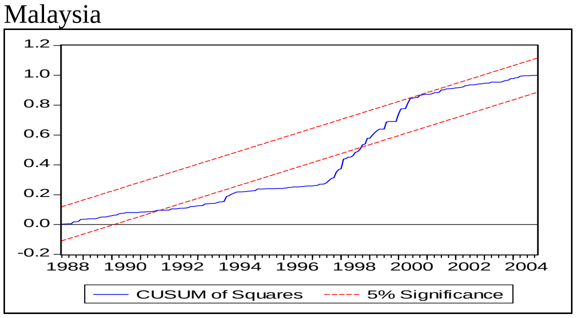
Indonesia



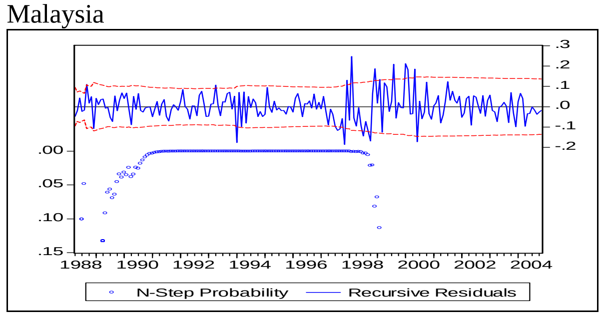
Indonesia



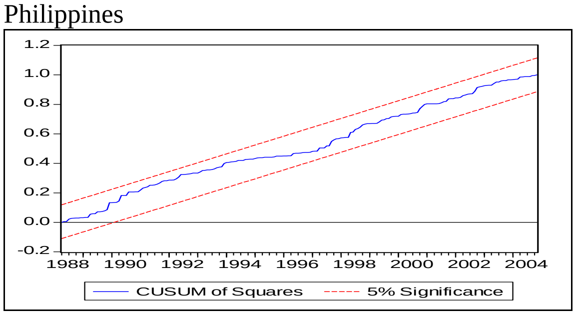
Malaysia



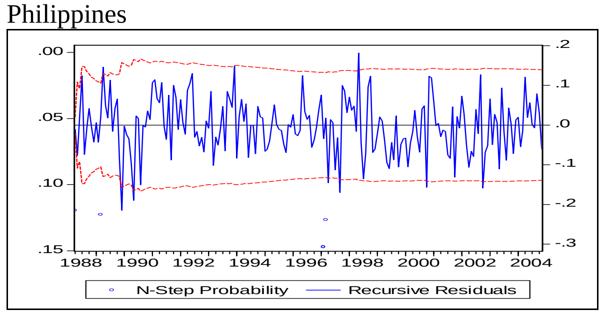
Malaysia



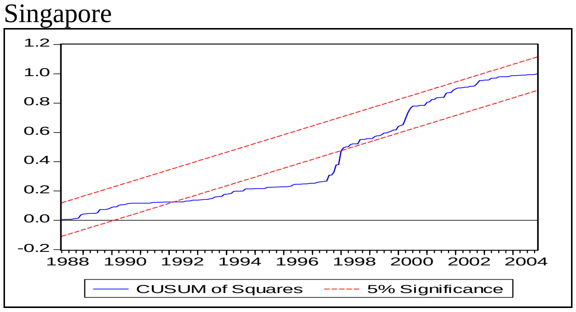
Philippines



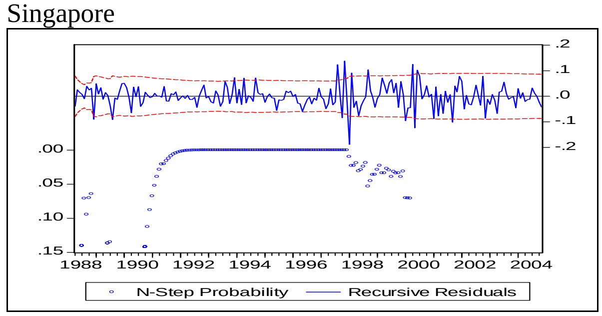
Philippines



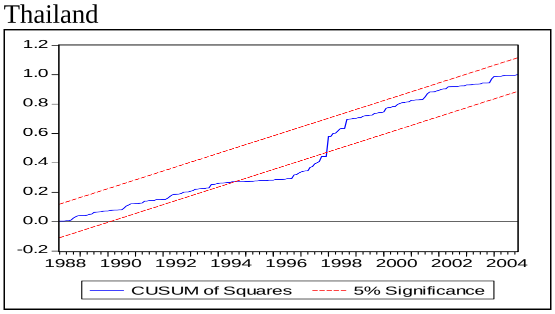
Singapore



Singapore



Thailand



Thailand

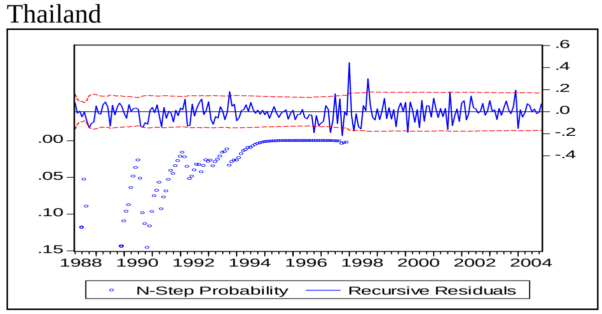


Table 3 Three-Year Rolling Regressions: OLS Estimation of the TB-ICAPM Model for Indonesia

	Constant	AFTA	World	Q(12)	$Q^2(12)$	Normality	ARCH LM (12)	Adj R^2
1988/1-1990/12	0.038	0.904	-1.021	12.575	12.190	107.279	1.078	0.021
	(0.137)	(0.032)**	(0.083)*	(0.401)	(0.431)	(0.000)***	(0.454)	
1989/1-1991/12	0.004	1.530	-1.429	8.473	0.898	109.793	0.418	0.227
	(0.877)	(0.001)***	(0.041)**	(0.747)	(0.999)	(0.000)***	(0.925)	
1990/1-1992/12	-0.013	1.373	-0.802	8.799	19.533	1.205	0.608	0.470
	(0.431)	(0.000)***	(0.040)**	(0.720)	(0.076)*	(0.547)	(0.798)	
1991/1-1993/12	-0.025	1.002	-0.172	4.834	6.577	0.189	0.315	0.450
	(0.160)	(0.001)***	(0.585)	(0.963)	(0.884)	(0.910)	(0.978)	
1992/1-1994/12	-0.004	0.583	0.518	13.019	8.866	1.536	0.756	0.607
	(0.754)	(0.001)***	(0.029)**	(0.368)	(0.714)	(0.464)	(0.682)	
1993/1-1995/12	0.000	0.605	0.541	26.479	12.823	0.790	0.649	0.601
	(0.973)	(0.000)***	(0.059)*	(0.009)***	(0.382)	(0.674)	(0.765)	
1994/1-1996/12	0.004	0.801	0.559	11.536	10.739	0.769	2.255	0.719
	(0.657)	(0.001)***	(0.088)*	(0.484)	(0.551)	(0.681)	(0.094)*	
1995/1-1997/12	0.012	1.400	-0.146	12.744	11.623	30.574	19.048	0.676
	(0.218)	(0.000)***	(0.690)	(0.388)	(0.476)	(0.000)***	(0.000)***	
1996/1-1998/12	0.004	1.258	-0.580	19.873	22.558	5.028	2.785	0.406
	(0.905)	(0.001)***	(0.424)	(0.070)*	(0.032)**	(0.081)**	(0.050)*	
1997/1-1999/12	0.001	1.332	-0.672	15.200	18.787	2.258	0.844	0.444
	(0.979)	(0.000)***	(0.319)	(0.231)	(0.094)*	(0.323)	(0.614)	
1998/1-2000/12	-0.013	1.255	-0.680	28.155	22.887	0.494	1.646	0.397
	(0.630)	(0.000)***	(0.285)	(0.005)***	(0.029)**	(0.781)	(0.209)	
1999/1-2001/12	-0.005	1.448	-0.590	5.963	7.165	2.802	0.521	0.575
	(0.779)	(0.000)***	(0.011)**	(0.918)	(0.847)	(0.246)	(0.861)	
2000/1-2002/12	0.002	1.290	-0.438	14.493	7.818	1.751	0.378	0.463
	(0.922)	(0.000)***	(0.112)	(0.270)	(0.799)	(0.417)	(0.945)	
2001/1-2003/12	0.030	0.897	-0.207	4.534	15.289	0.301	0.960	0.248
	(0.131)	(0.002)***	(0.543)	(0.972)	(0.226)	(0.860)	(0.530)	
2002/1-2004/11	0.023	0.873	0.104	7.098	20.613	1.773	2.857	0.453
	(0.164)	(0.042)**	(0.835)	(0.851)	(0.056)*	(0.412)	(0.053)*	

Note: The White (1980) heteroskedasticity consistent covariance estimates are used to assess the significance of the coefficients. Figures in the parentheses are p-values. * denotes significance at the 0.10 level; ** denotes significance at the 0.05 level; and *** denotes significance at the 0.01 level.

Table 4 Three-Year Rolling Regressions: OLS Estimation of the TB-ICAPM Model for Malaysia

	Constant	AFTA	World	Q(12)	Q^2(12)	Normality	ARCH LM (12)	Adj R^2
1988/1-1990/12	0.004	0.369	0.764	15.980	10.116	0.479	0.404	0.658
	(0.580)	(0.007)***	(0.000)***	(0.192)	(0.606)	(0.787)	(0.933)	
1989/1-1991/12	0.004	0.403	0.624	13.087	6.299	0.556	0.258	0.737
	(0.611)	(0.002)***	(0.000)***	(0.363)	(0.900)	(0.757)	(0.986)	
1990/1-1992/12	0.005	0.594	0.347	6.968	5.215	0.599	0.561	0.794
	(0.460)	(0.000)***	(0.010)**	(0.860)	(0.950)	(0.741)	(0.833)	
1991/1-1993/12	0.010	0.641	0.237	13.384	9.719	0.833	0.464	0.735
	(0.213)	(0.000)***	(0.048)**	(0.342)	(0.641)	(0.659)	(0.898)	
1992/1-1994/12	0.001	0.792	0.114	21.502	11.601	0.630	0.536	0.673
	(0.937)	(0.000)***	(0.683)	(0.043)**	(0.478)	(0.730)	(0.850)	
1993/1-1995/12	0.001	0.833	0.143	21.278	12.732	0.433	1.761	0.688
	(0.953)	(0.000)***	(0.633)	(0.046)**	(0.389)	(0.805)	(0.179)	
1994/1-1996/12	0.001	0.738	0.147	15.199	10.896	2.686	0.301	0.584
	(0.858)	(0.005)***	(0.703)	(0.231)	(0.538)	(0.261)	(0.975)	
1995/1-1997/12	0.003	0.899	-0.084	6.281	9.561	5.939	1.636	0.686
	(0.726)	(0.000)***	(0.801)	(0.901)	(0.654)	(0.051)*	(0.212)	
1996/1-1998/12	-0.007	0.860	-0.112	12.329	16.629	2.888	0.619	0.596
	(0.726)	(0.001)***	(0.786)	(0.420)	(0.164)	(0.236)	(0.789)	
1997/1-1999/12	0.004	0.980	-0.585	11.312	20.237	2.566	0.557	0.607
	(0.831)	(0.000)***	(0.133)	(0.502)	(0.063)*	(0.277)	(0.835)	
1998/1-2000/12	0.013	0.745	-0.478	5.200	17.037	1.623	1.036	0.371
	(0.502)	(0.001)***	(0.253)	(0.951)	(0.148)	(0.444)	(0.480)	
1999/1-2001/12	0.033	0.470	0.103	12.050	21.700	0.463	0.475	0.328
	(0.038)**	(0.027)**	(0.687)	(0.442)	(0.041)**	(0.794)	(0.892)	
2000/1-2002/12	0.021	0.188	0.459	6.872	9.697	0.873	1.992	0.401
	(0.100)	(0.208)	(0.006)***	(0.866)	(0.643)	(0.646)	(0.132)	
2001/1-2003/12	0.015	0.419	0.346	3.948	8.779	0.735	0.496	0.596
	(0.125)	(0.005)***	(0.032)**	(0.984)	(0.722)	(0.692)	(0.878)	
2002/1-2004/11	0.000	0.277	0.570	8.801	8.558	1.632	0.315	0.714
	(0.991)	(0.043)**	(0.000)***	(0.720)	(0.740)	(0.442)	(0.969)	

Note: The White (1980) heteroskedasticity consistent covariance estimates are used to assess the significance of the coefficients. Figures in the parentheses are p-values. * denotes significance at the 0.10 level; ** denotes significance at the 0.05 level; and *** denotes significance at the 0.01 level.

Table 5 Three-Year Rolling Regressions: OLS Estimation of the TB-ICAPM Model for Philippines

	Constant	AFTA	World	Q(12)	$Q^2(12)$	Normality	ARCH LM (12)	Adj R^2
1988/1-1990/12	-0.010	0.528	0.316	12.739	21.586	2.966	1.256	0.300
	(0.499)	(0.002)***	(0.251)	(0.388)	(0.042)**	(0.227)	(0.356)	
1989/1-1991/12	0.002	0.592	0.574	17.268	15.096	10.808	1.005	0.465
	(0.864)	(0.001)***	(0.012)**	(0.140)	(0.236)	(0.004)***	(0.500)	
1990/1-1992/12	0.006	0.738	0.437	9.661	4.164	7.051	1.541	0.610
	(0.583)	(0.000)***	(0.036)**	(0.646)	(0.980)	(0.029)**	(0.241)	
1991/1-1993/12	0.022	0.984	0.224	5.981	12.271	1.526	0.620	0.668
	(0.056)*	(0.000)***	(0.286)	(0.917)	(0.424)	(0.466)	(0.788)	
1992/1-1994/12	0.011	1.096	-0.035	15.367	17.428	1.309	1.359	0.726
	(0.313)	(0.000)***	(0.877)	(0.222)	(0.134)	(0.520)	(0.309)	
1993/1-1995/12	0.000	1.224	-0.315	18.350	13.898	0.230	0.731	0.780
	(0.958)	(0.000)***	(0.016)**	(0.105)	(0.307)	(0.891)	(0.701)	
1994/1-1996/12	0.002	1.022	-0.182	12.213	5.674	2.730	0.501	0.712
	(0.790)	(0.000)***	(0.260)	(0.429)	(0.932)	(0.255)	(0.875)	
1995/1-1997/12	0.004	0.923	-0.274	12.559	4.742	0.427	0.255	0.660
	(0.724)	(0.000)***	(0.498)	(0.402)	(0.966)	(0.808)	(0.987)	
1996/1-1998/12	0.002	0.730	0.355	11.509	8.825	0.111	0.303	0.676
	(0.881)	(0.000)***	(0.297)	(0.486)	(0.718)	(0.946)	(0.974)	
1997/1-1999/12	-0.023	0.593	0.728	14.394	11.329	0.016	0.593	0.698
	(0.075)*	(0.000)***	(0.008)***	(0.276)	(0.501)	(0.992)	(0.809)	
1998/1-2000/12	-0.015	0.580	1.009	5.505	5.051	1.609	1.552	0.735
	(0.231)	(0.000)***	(0.000)***	(0.939)	(0.956)	(0.447)	(0.237)	
1999/1-2001/12	-0.026	0.623	0.636	11.369	17.798	0.359	0.703	0.750
	(0.025)**	(0.000)***	(0.001)***	(0.498)	(0.122)	(0.836)	(0.724)	
2000/1-2002/12	-0.019	0.803	0.289	12.135	20.559	0.526	0.877	0.632
	(0.144)	(0.000)***	(0.163)	(0.435)	(0.057)*	(0.769)	(0.590)	
2001/1-2003/12	-0.027	0.932	0.240	11.512	10.220	0.491	0.413	0.656
	(0.053)*	(0.000)***	(0.249)	(0.486)	(0.597)	(0.782)	(0.928)	
2002/1-2004/11	-0.015	0.982	-0.061	8.298	8.032	0.531	0.394	0.603
	(0.180)	(0.001)***	(0.818)	(0.761)	(0.783)	(0.767)	(0.935)	

Note: The White (1980) heteroskedasticity consistent covariance estimates are used to assess the significance of the coefficients. Figures in the parentheses are p-values. * denotes significance at the 0.10 level; ** denotes significance at the 0.05 level; and *** denotes significance at the 0.01 level.

Table 6 Three-Year Rolling Regressions: OLS Estimation of the TB-ICAPM Model for Singapore

	Constant	AFTA	World	Q(12)	Q^2(12)	Normality	ARCH LM (12)	Adj R^2
1988/1-1990/12	0.002	0.384	0.673	18.096	8.382	1.202	0.370	0.749
	(0.708)	(0.008)***	(0.000)***	(0.113)	(0.755)	(0.548)	(0.949)	
1989/1-1991/12	0.006	0.364	0.658	14.740	7.549	4.730	2.229	0.834
	(0.336)	(0.006)***	(0.000)***	(0.256)	(0.819)	(0.094)*	(0.098)*	
1990/1-1992/12	0.005	0.463	0.543	7.487	12.605	0.036	0.806	0.921
	(0.278)	(0.000)***	(0.000)***	(0.824)	(0.398)	(0.982)	(0.643)	
1991/1-1993/12	0.003	0.491	0.523	14.867	8.825	2.302	0.956	0.891
	(0.527)	(0.000)***	(0.000)***	(0.249)	(0.718)	(0.316)	(0.533)	
1992/1-1994/12	0.005	0.485	0.477	11.065	13.461	3.585	1.734	0.861
	(0.377)	(0.000)***	(0.000)***	(0.523)	(0.336)	(0.167)	(0.185)	
1993/1-1995/12	0.004	0.521	0.464	8.763	16.390	1.849	0.563	0.840
	(0.422)	(0.000)***	(0.000)***	(0.723)	(0.174)	(0.397)	(0.831)	
1994/1-1996/12	-0.003	0.447	0.428	13.452	14.326	1.815	0.886	0.801
	(0.578)	(0.000)***	(0.000)***	(0.337)	(0.280)	(0.404)	(0.583)	
1995/1-1997/12	-0.016	0.192	1.023	13.360	9.404	7.663	4.129	0.732
	(0.026)**	(0.171)	(0.000)***	(0.343)	(0.668)	(0.022)**	(0.013)**	
1996/1-1998/12	-0.009	0.434	0.688	15.471	11.487	12.760	0.300	0.710
	(0.248)	(0.001)***	(0.010)**	(0.217)	(0.488)	(0.002)***	(0.975)	
1997/1-1999/12	0.007	0.471	0.640	12.323	11.128	5.352	0.485	0.720
	(0.433)	(0.000)***	(0.003)***	(0.420)	(0.518)	(0.069)*	(0.885)	
1998/1-2000/12	0.008	0.590	0.438	5.801	3.649	1.573	0.660	0.706
	(0.454)	(0.000)***	(0.108)	(0.926)	(0.989)	(0.455)	(0.757)	
1999/1-2001/12	0.011	0.434	0.391	18.816	12.682	1.286	0.349	0.625
	(0.317)	(0.000)***	(0.023)**	(0.093)*	(0.393)	(0.526)	(0.958)	
2000/1-2002/12	0.001	0.397	0.418	13.274	10.768	0.096	0.386	0.609
	(0.950)	(0.009)***	(0.015)**	(0.349)	(0.549)	(0.953)	(0.942)	
2001/1-2003/12	0.004	0.346	0.450	7.441	16.748	0.933	0.580	0.696
	(0.614)	(0.028)**	(0.007)***	(0.827)	(0.159)	(0.627)	(0.818)	
2002/1-2004/11	-0.002	0.412	0.509	9.232	19.459	0.538	2.602	0.831
	(0.789)	(0.050)*	(0.044)**	(0.683)	(0.078)*	(0.764)	(0.070)*	

Note: The White (1980) heteroskedasticity consistent covariance estimates are used to assess the significance of the coefficients. Figures in the parentheses are p-values. * denotes significance at the 0.10 level; ** denotes significance at the 0.05 level; and *** denotes significance at the 0.01 level.

Table 7 Three-Year Rolling Regressions: OLS Estimation of the TB-ICAPM Model for Thailand

	Constant	AFTA	World	Q(12)	Q^2(12)	Normality	ARCH LM (12)	Adj R^2
1988/1-1990/12	0.006	0.595	0.818	16.297	11.794	2.712	0.666	0.548
	(0.648)	(0.027)**	(0.005)***	(0.178)	(0.462)	(0.258)	(0.752)	
1989/1-1991/12	0.000	0.828	0.504	18.035	8.070	2.302	0.766	0.660
	(0.989)	(0.000)***	(0.010)**	(0.115)	(0.780)	(0.316)	(0.674)	
1990/1-1992/12	-0.001	0.875	0.310	21.098	13.033	2.097	0.747	0.653
	(0.963)	(0.000)***	(0.145)	(0.049)**	(0.367)	(0.351)	(0.689)	
1991/1-1993/12	0.009	0.970	-0.013	19.254	7.463	0.509	0.539	0.556
	(0.470)	(0.000)***	(0.952)	(0.083)*	(0.826)	(0.775)	(0.848)	
1992/1-1994/12	0.002	1.160	-0.179	18.638	13.053	0.179	0.678	0.679
	(0.825)	(0.000)***	(0.414)	(0.098)*	(0.365)	(0.914)	(0.743)	
1993/1-1995/12	-0.002	1.229	-0.211	15.716	16.547	3.357	3.808	0.778
	(0.803)	(0.000)***	(0.261)	(0.205)	(0.167)	(0.187)	(0.017)**	
1994/1-1996/12	-0.016	1.181	-0.110	12.888	6.066	27.773	0.677	0.715
	(0.064)*	(0.000)***	(0.563)	(0.377)	(0.913)	(0.000)***	(0.744)	
1995/1-1997/12	-0.043	0.824	0.781	6.149	17.142	2.600	1.129	0.664
	(0.004)***	(0.000)***	(0.181)	(0.908)	(0.144)	(0.273)	(0.424)	
1996/1-1998/12	-0.055	0.553	1.669	12.586	14.510	7.498	0.567	0.605
	(0.001)***	(0.037)**	(0.027)**	(0.400)	(0.269)	(0.024)**	(0.828)	
1997/1-1999/12	-0.029	0.754	1.302	10.714	14.335	9.360	0.384	0.626
	(0.083)*	(0.001)***	(0.043)**	(0.554)	(0.280)	(0.009)***	(0.943)	
1998/1-2000/12	-0.009	0.837	1.047	13.322	3.395	14.677	0.583	0.596
	(0.600)	(0.004)***	(0.098)*	(0.346)	(0.992)	(0.001)***	(0.816)	
1999/1-2001/12	-0.018	1.284	0.168	57.898	8.457	0.529	1.095	0.732
	(0.247)	(0.000)***	(0.445)	(0.000)***	(0.748)	(0.767)	(0.444)	
2000/1-2002/12	-0.005	1.227	0.155	25.693	6.541	0.586	0.243	0.665
	(0.761)	(0.000)***	(0.458)	(0.012)**	(0.886)	(0.746)	(0.989)	
2001/1-2003/12	0.022	0.823	0.308	7.521	4.047	0.751	0.506	0.560
	(0.105)	(0.003)***	(0.129)	(0.821)	(0.983)	(0.687)	(0.872)	
2002/1-2004/11	0.019	0.577	0.548	7.288	8.258	4.843	0.362	0.687
	(0.085)*	(0.027)**	(0.027)**	(0.838)	(0.765)	(0.089)*	(0.951)	

Note: The White (1980) heteroskedasticity consistent covariance estimates are used to assess the significance of the coefficients. Figures in the parentheses are p-values. * denotes significance at the 0.10 level; ** denotes significance at the 0.05 level; and *** denotes significance at the 0.01 level.

Table 8 Three-Year Rolling Regressions for the Conditional TB-ICAPM Model of Indonesia

	Mean Constant	AFTA	World	Variance Constant	ARCH	GARCH	Q(12)	$Q^2(12)$	Normality	ARCH LM (12)	Adj R^2	ARCH+ GARCH
88/1-90/12	0.012	0.422	-0.806	0.001	-0.112	1.183	11.397	12.177	8.458	0.335	0.156	1.071
	(0.420)	(0.100)***	(0.011)**	(0.701)	(0.572)	(0.000)***	(0.495)	(0.432)	(0.015)**	(0.963)		
89/1-91/12	-0.013	1.416	-1.351	0.007	0.910	-0.047	10.782	3.082	6.805	0.479	0.128	0.863
	(0.271)	(0.000)***	(0.033)**	(0.018)**	(0.381)	(0.007)***	(0.548)	(0.995)	(0.033)**	(0.889)		
90/1-92/12	-0.023	1.273	-0.724	0.001	-0.277	1.134	14.560	20.293	2.015	0.699	0.406	0.857
	(0.007)***	(0.000)***	(0.000)***	(0.001)***	(0.208)	(0.000)***	(0.266)	(0.062)*	(0.365)	(0.727)		
91/1-93/12	-0.019	0.666	0.203	0.000	-0.201	1.167	5.712	13.836	1.345	0.926	0.358	0.966
	(0.066)*	(0.000)***	(0.155)	(0.000)***	(0.348)	(0.000)***	(0.930)	(0.311)	(0.510)	(0.554)		
92/1-94/12	-0.005	0.535	0.567	0.002	-0.027	0.531	13.250	13.024	1.520	0.901	0.567	0.504
	(0.637)	(0.000)***	(0.005)***	(0.699)	(0.800)	(0.671)	(0.351)	(0.367)	(0.468)	(0.572)		
93/1-95/12	0.003	0.907	0.169	0.000	0.333	0.595	14.430	17.321	0.303	0.912	0.516	0.928
	(0.770)	(0.000)***	(0.402)	(0.639)	(0.038)**	(0.087)*	(0.274)	(0.138)	(0.859)	(0.564)		
94/1-96/12	0.008	1.100	0.134	0.000	-0.166	1.070	6.654	7.642	1.987	0.883	0.657	0.904
	(0.142)	(0.000)***	(0.345)	(0.445)	(0.481)	(0.006)***	(0.880)	(0.812)	(0.370)	(0.585)		
95/1-97/12	0.021	1.262	-0.147	0.000	1.286	0.056	11.733	7.999	1.965	0.965	0.626	1.342
	(0.000)***	(0.000)***	(0.390)	(0.120)	(0.002)***	(0.558)	(0.467)	(0.785)	(0.374)	(0.527)		
96/1-98/12	0.014	1.052	0.673	0.000	0.514	0.752	12.593	7.764	1.195	0.367	0.244	1.266
	(0.070)*	(0.000)***	(0.001)***	(0.835)	(0.112)	(0.001)***	(0.399)	(0.803)	(0.550)	(0.951)		
97/1-99/12	0.019	1.358	-0.137	0.002	0.473	0.594	18.482	17.371	1.015	0.772	0.350	1.067
	(0.442)	(0.000)***	(0.756)	(0.408)	(0.032)**	(0.000)***	(0.102)	(0.136)	(0.602)	(0.669)		
98/1-00/12	-0.039	1.255	-0.633	-0.001	-0.082	1.048	13.353	14.038	1.795	1.084	0.318	0.966
	(0.001)***	(0.000)***	(0.008)***	(0.000)***	(0.634)	(0.000)***	(0.344)	(0.298)	(0.408)	(0.450)		
99/1-01/12	-0.007	1.459	-0.553	0.002	-0.083	0.853	6.882	6.210	1.929	0.532	0.532	0.770
	(0.655)	(0.000)***	(0.006)***	(0.416)	(0.392)	(0.005)***	(0.865)	(0.905)	(0.381)	(0.853)		
00/1-02/12	0.009	1.077	-0.318	0.002	-0.239	1.057	12.274	5.939	2.129	0.395	0.395	0.818
	(0.512)	(0.000)***	(0.012)**	(0.318)	(0.052)*	(0.000)***	(0.424)	(0.919)	(0.345)	(0.937)		
01/1-03/12	0.020	0.802	-0.177	0.001	-0.259	1.131	4.433	7.066	0.890	0.411	0.154	0.873
	(0.042)**	(0.000)***	(0.033)**	(0.000)***	(0.027)**	(0.000)***	(0.974)	(0.853)	(0.641)	(0.929)		
02/1-04/11	0.022	0.982	-0.008	0.002	0.036	0.702	7.179	22.320	1.574	2.747	0.394	0.738
	(0.156)	(0.011)**	(0.987)	(0.801)	(0.744)	(0.500)	(0.846)	(0.034)**	(0.455)	(0.060)*		
Full Sample	0.004	1.232	-0.258	0.000	0.306	0.763	8.348	18.773	356.015	7.839	0.359	1.069
	(0.524)	(0.000)***	(0.094)*	(0.500)	(0.027)**	(0.000)***	(0.757)	(0.094)*	(0.000)***	(0.000)***		

Note: The estimation is based on the Bollerslev-Wooldridge quasi-maximum likelihood robust method under the assumption of normal distribution. Figures in the parentheses are p-values. * denotes significance at the 0.10 level; ** denotes significance at the 0.05 level; and *** denotes significance at the 0.01 level.

Table 9 Three-Year Rolling Regressions for the Conditional TB-ICAPM Model of Malaysia

	Mean Constant	AFTA	World	Variance Constant	ARCH	GARCH	Q(12)	$Q^2(12)$	Normality	ARCH LM (12)	Adj R^2	ARCH+ GARCH
88/1-90/12	0.001	0.364	0.827	0.000	-0.219	1.124	11.312	6.797	0.603	0.631	0.619	0.905
	(0.894)	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.502)	(0.871)	(0.740)	(0.780)		
89/1-91/12	0.002	0.440	0.573	0.000	0.216	0.544	13.432	7.770	1.067	0.210	0.709	0.760
	(0.706)	(0.000)***	(0.001)***	(0.528)	(0.292)	(0.295)	(0.338)	(0.803)	(0.586)	(0.994)		
90/1-92/12	0.001	0.595	0.361	0.000	-0.223	1.149	6.748	10.178	1.335	0.981	0.771	0.926
	(0.765)	(0.000)***	(0.000)***	(0.000)***	(0.001)***	(0.000)***	(0.874)	(0.600)	(0.513)	(0.516)		
91/1-93/12	0.008	0.646	0.242	0.001	-0.141	0.592	13.635	5.892	0.468	0.371	0.708	0.451
	(0.000)***	(0.000)***	(0.036)**	(0.000)***	(0.336)	(0.010)**	(0.325)	(0.921)	(0.792)	(0.949)		
92/1-94/12	0.000	0.809	0.106	0.001	0.071	0.485	19.398	10.390	0.512	0.463	0.640	0.556
	(0.971)	(0.000)***	(0.682)	(0.634)	(0.605)	(0.614)***	(0.079)*	(0.582)	(0.774)	(0.899)		
93/1-95/12	-0.004	1.037	0.174	0.000	0.931	0.216	26.146	14.322	0.951	0.651	0.606	1.147
	(0.259)	(0.000)***	(0.136)	(0.128)	(0.002)***	(0.049)**	(0.010)**	(0.281)	(0.622)	(0.764)		
94/1-96/12	0.005	0.615	0.353	0.000	-0.175	1.008	5.369	10.832	1.454	0.570	0.530	0.833
	(0.312)	(0.000)***	(0.000)***	(0.000)***	(0.039)**	(0.000)***	(0.945)	(0.543)	(0.483)	(0.826)		
95/1-97/12	0.010	0.888	0.056	0.000	0.050	1.187	10.460	9.527	1.040	0.564	0.643	1.237
	(0.225)	(0.000)***	(0.808)	(0.000)***	(0.779)	(0.000)***	(0.576)	(0.657)	(0.594)	(0.831)		
96/1-98/12	0.012	0.842	-0.185	0.000	0.253	0.854	8.034	7.032	1.006	0.325	0.535	1.107
	(0.257)	(0.000)***	(0.475)	(0.946)	(0.258)	(0.000)***	(0.782)	(0.856)	(0.605)	(0.967)		
97/1-99/12	0.000	1.041	-0.713	0.001	-0.205	1.106	8.320	13.270	1.413	0.717	0.563	0.901
	(0.969)	(0.000)***	(0.009)***	(0.000)***	(0.089)*	(0.000)***	(0.760)	(0.350)	(0.493)	(0.712)		
98/1-00/12	0.003	0.794	-0.637	0.007	-0.272	0.684	8.041	12.549	0.002	0.659	0.297	0.412
	(0.768)	(0.000)***	(0.011)**	(0.000)***	(0.015)**	(0.000)***	(0.782)	(0.403)	(0.999)	(0.758)		
99/1-01/12	0.033	0.400	0.380	0.000	-0.116	1.143	10.719	15.445	1.147	1.465	0.221	1.027
	(0.001)***	(0.000)***	(0.001)***	(0.000)***	(0.642)	(0.000)***	(0.553)	(0.218)	(0.564)	(0.267)		
00/1-02/12	0.023	0.325	0.411	0.000	-0.143	1.071	7.696	14.116	1.846	1.583	0.317	0.928
	(0.001)***	(0.000)***	(0.000)***	(0.166)	(0.642)	(0.006)***	(0.808)	(0.293)	(0.397)	(0.227)		
01/1-03/12	0.019	0.418	0.317	0.002	-0.156	0.354	3.663	6.761	0.865	0.377	0.552	0.198
	(0.013)**	(0.000)***	(0.013)**	(0.309)	(0.059)*	(0.624)	(0.989)	(0.873)	(0.649)	(0.946)		
02/1-04/11	-0.002	0.310	0.551	0.001	0.232	0.166	8.658	7.758	1.412	0.492	0.683	0.398
	(0.747)	(0.008)***	(0.000)***	(0.368)	(0.181)	(0.813)	(0.732)	(0.804)	(0.494)	(0.878)		
Full Sample	0.002	0.522	0.398	0.000	0.159	0.797	7.872	9.846	0.700	0.722	0.565	0.956
	(0.654)	(0.000)***	(0.000)***	(0.270)	(0.042)**	(0.000)***	(0.795)	(0.629)	(0.705)	(0.729)		

Note: The estimation is based on the Bollerslev-Wooldridge quasi-maximum likelihood robust method under the assumption of normal distribution. Figures in the parentheses are p-values. * denotes significance at the 0.10 level; ** denotes significance at the 0.05 level; and *** denotes significance at the 0.01 level.

Table 10 Three-Year Rolling Regressions for the Conditional TB-ICAPM Model of Philippines

	Mean Constant	AFTA	World	Variance Constant	ARCH	GARCH	Q(12)	$Q^2(12)$	Normality	ARCH LM (12)	Adj R^2	ARCH+ GARCH
88/1-90/12	-0.010	0.541	0.274	0.003	-0.141	0.567	12.357	19.316	2.794	1.548	0.229	0.426
	(0.198)	(0.000)***	(0.010)**	(0.177)	(0.018)**	(0.116)	(0.417)	(0.081)*	(0.247)	(0.239)		
89/1-91/12	0.008	0.616	0.385	0.003	-0.137	0.618	15.643	15.265	6.775	0.882	0.399	0.481
	(0.363)	(0.000)***	(0.004)***	(0.015)**	(0.056)*	(0.002)***	(0.208)	(0.227)	(0.034)**	(0.585)		
90/1-92/12	0.009	0.738	0.424	0.003	-0.096	0.543	7.235	3.996	5.634	1.360	0.570	0.448
	(0.320)	(0.000)***	(0.030)**	(0.327)	(0.085)**	(0.438)	(0.842)	(0.984)	(0.060)*	(0.309)		
91/1-93/12	0.014	1.091	0.122	0.001	-0.397	1.077	9.193	13.672	2.164	0.935	0.626	0.680
	(0.011)**	(0.000)***	(0.303)	(0.147)	(0.014)**	(0.000)***	(0.686)	(0.322)	(0.339)	(0.548)		
92/1-94/12	0.012	1.078	0.001	0.001	-0.054	0.766	15.482	16.378	1.347	1.533	0.698	0.711
	(0.222)	(0.000)***	(0.997)	(0.797)	(0.738)	(0.460)	(0.216)	(0.175)	(0.510)	(0.244)		
93/1-95/12	-0.004	1.358	-0.490	0.001	-0.310	1.004	14.182	17.805	0.450	1.361	0.750	0.694
	(0.367)	(0.000)***	(0.000)***	(0.000)***	(0.001)***	(0.000)***	(0.289)	(0.122)	(0.799)	(0.308)		
94/1-96/12	0.007	1.115	-0.292	0.000	-0.189	1.117	18.227	12.471	0.101	1.342	0.677	0.928
	(0.213)	(0.000)***	(0.015)**	(0.000)***	(0.352)	(0.000)***	(0.109)	(0.409)	(0.951)	(0.317)		
95/1-97/12	-0.012	0.916	0.302	0.000	-0.032	1.139	10.994	5.671	0.066	0.239	0.542	1.107
	(0.227)	(0.000)***	(0.271)	(0.320)	(0.931)	(0.000)***	(0.529)	(0.932)	(0.967)	(0.990)		
96/1-98/12	0.009	0.796	0.210	0.000	-0.119	1.142	11.632	6.463	0.296	0.283	0.640	1.022
	(0.332)	(0.000)***	(0.372)	(0.551)	(0.563)	(0.000)***	(0.476)	(0.891)	(0.862)	(0.980)		
97/1-99/12	-0.023	0.610	0.671	0.006	-0.104	0.044	16.154	7.253	0.151	0.501	0.667	-0.061
	(0.055)*	(0.000)***	(0.007)***	(0.334)	(0.319)	(0.969)	(0.184)	(0.840)	(0.927)	(0.874)		
98/1-00/12	-0.028	0.588	0.908	0.000	-0.194	1.166	8.545	9.897	1.139	2.177	0.696	0.973
	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.090)**	(0.000)***	(0.741)	(0.625)	(0.566)	(0.104)		
99/1-01/12	-0.034	0.663	0.521	0.002	0.662	-0.300	6.669	14.126	2.244	0.541	0.713	0.362
	(0.000)***	(0.000)***	(0.000)***	(0.017)**	(0.002)***	(0.125)	(0.879)	(0.293)	(0.326)	(0.847)		
00/1-02/12	-0.016	0.790	0.317	0.005	0.659	-0.659	10.109	10.568	0.951	0.638	0.595	0.001
	(0.000)***	(0.000)***	(0.000)***	(0.001)***	(0.000)***	(0.000)***	(0.606)	(0.566)	(0.622)	(0.774)		
01/1-03/12	-0.026	0.934	0.342	0.000	-0.203	1.177	12.926	5.538	1.830	0.348	0.610	0.974
	(0.003)***	(0.000)***	(0.009)***	(0.000)***	(0.189)	(0.000)***	(0.374)	(0.938)	(0.401)	(0.959)		
02/1-04/11	-0.023	0.912	-0.034	0.001	-0.305	1.190	12.214	10.476	1.857	0.826	0.551	0.885
	(0.001)***	(0.000)***	(0.851)	(0.000)***	(0.209)	(0.000)***	(0.429)	(0.574)	(0.395)	(0.628)		
Full Sample	-0.003	0.732	0.341	0.003	-0.004	0.334	10.383	27.781	1.656	2.380	0.637	0.330
	(0.493)	(0.000)***	(0.000)***	(0.938)	(0.934)	(0.969)	(0.582)	(0.006)***	(0.437)	(0.007)***		

Note: The estimation is based on the Bollerslev-Wooldridge quasi-maximum likelihood robust method under the assumption of normal distribution. Figures in the parentheses are p-values. * denotes significance at the 0.10 level; ** denotes significance at the 0.05 level; and *** denotes significance at the 0.01 level.

Table 11 Three-Year Rolling Regressions for the Conditional TB-ICAPM Model of Singapore

	Mean Constant	AFTA	World	Variance Constant	ARCH	GARCH	Q(12)	$Q^2(12)$	Normality	ARCH LM (12)	Adj R^2	ARCH+ GARCH
88/1-90/12	0.002	0.378	0.615	0.001	-0.207	0.770	16.504	11.278	1.042	0.594	0.720	0.563
	(0.691)	(0.000)***	(0.000)***	(0.004)***	(0.284)	(0.002)***	(0.169)	(0.505)	(0.594)	(0.808)		
89/1-91/12	0.006	0.400	0.631	0.000	0.337	0.507	12.093	8.062	3.799	0.501	0.816	0.843
	(0.286)	(0.000)***	(0.000)***	(0.484)	(0.467)	(0.300)	(0.438)	(0.780)	(0.150)	(0.874)		
90/1-92/12	0.003	0.427	0.567	0.000	-0.167	1.070	9.140	5.987	0.636	0.585	0.911	0.903
	(0.330)	(0.000)***	(0.000)***	(0.000)***	(0.003)***	(0.000)***	(0.691)	(0.917)	(0.727)	(0.814)		
91/1-93/12	0.004	0.427	0.570	0.000	-0.114	1.207	9.054	5.107	1.691	0.730	0.877	1.093
	(0.245)	(0.000)***	(0.000)***	(0.000)***	(0.696)	(0.000)***	(0.698)	(0.954)	(0.429)	(0.702)		
92/1-94/12	0.002	0.399	0.569	0.000	-0.164	1.160	4.780	13.290	2.028	1.308	0.839	0.997
	(0.571)	(0.000)***	(0.000)***	(0.000)***	(0.399)	(0.000)***	(0.965)	(0.348)	(0.363)	(0.332)		
93/1-95/12	0.004	0.512	0.470	0.000	-0.171	1.138	4.627	18.196	1.273	0.844	0.824	0.967
	(0.262)	(0.000)***	(0.000)***	(0.000)***	(0.233)	(0.000)***	(0.969)	(0.110)	(0.529)	(0.614)		
94/1-96/12	-0.001	0.501	0.402	0.000	-0.185	1.144	14.895	14.963	0.421	1.363	0.778	0.958
	(0.576)	(0.000)***	(0.000)***	(0.000)***	(0.471)	(0.000)***	(0.247)	(0.243)	(0.810)	(0.308)		
95/1-97/12	-0.012	0.261	0.825	0.000	0.034	1.169	12.082	15.700	1.042	1.129	0.696	1.204
	(0.049)**	(0.000)***	(0.000)***	(0.000)***	(0.888)	(0.000)***	(0.439)	(0.205)	(0.594)	(0.424)		
96/1-98/12	-0.011	0.309	0.771	0.000	0.295	0.749	13.477	14.261	2.244	0.430	0.657	1.044
	(0.103)	(0.038)**	(0.000)***	(0.293)	(0.253)	(0.000)***	(0.335)	(0.284)	(0.326)	(0.919)		
97/1-99/12	0.012	0.426	0.729	0.000	0.280	0.630	9.280	12.295	0.786	0.522	0.684	0.910
	(0.143)	(0.000)***	(0.000)***	(0.473)	(0.286)	(0.015)**	(0.679)	(0.422)	(0.675)	(0.860)		
98/1-00/12	0.018	0.504	0.808	0.001	0.561	0.192	6.761	13.868	1.424	0.938	0.637	0.753
	(0.002)***	(0.000)***	(0.000)***	(0.063)*	(0.010)**	(0.188)	(0.873)	(0.309)	(0.491)	(0.545)		
99/1-01/12	0.006	0.372	0.409	0.004	0.280	-0.452	19.134	9.508	1.998	0.338	0.578	-0.172
	(0.467)	(0.000)***	(0.004)***	(0.078)*	(0.261)	(0.254)	(0.085)*	(0.659)	(0.368)	(0.962)		
00/1-02/12	0.002	0.239	0.432	0.001	1.144	-0.139	17.495	6.482	0.627	0.603	0.537	1.004
	(0.693)	(0.000)***	(0.000)***	(0.001)***	(0.001)***	(0.005)***	(0.132)	(0.890)	(0.731)	(0.801)		
01/1-03/12	-0.003	0.309	0.446	0.002	0.547	-0.384	9.632	12.749	0.610	0.520	0.644	0.163
	(0.459)	(0.000)***	(0.000)***	(0.004)***	(0.024)**	(0.021)**	(0.648)	(0.388)	(0.737)	(0.862)		
02/1-04/11	-0.001	0.402	0.567	0.000	-0.145	1.089	9.320	10.980	0.439	0.777	0.811	0.944
	(0.709)	(0.000)***	(0.000)***	(0.000)***	(0.493)	(0.000)***	(0.675)	(0.531)	(0.803)	(0.665)		
Full Sample	0.002	0.401	0.572	0.000	0.174	0.799	11.058	10.061	3.139	0.864	0.759	0.973
	(0.520)	(0.000)***	(0.000)***	(0.217)	(0.034)**	(0.000)***	(0.524)	(0.611)	(0.208)	(0.585)		

Note: The estimation is based on the Bollerslev-Wooldridge quasi-maximum likelihood robust method under the assumption of normal distribution. Figures in the parentheses are p-values. * denotes significance at the 0.10 level; ** denotes significance at the 0.05 level; and *** denotes significance at the 0.01 level.

Table 12 Three-Year Rolling Regressions for the Conditional TB-ICAPM Model of Thailand

	Mean Constant	AFTA	World	Variance Constant	ARCH	GARCH	Q(12)	$Q^2(12)$	Normality	ARCH LM (12)	Adj R^2	ARCH+ GARCH
88/1-90/12	0.005	0.676	0.844	0.002	-0.262	0.914	9.417	8.857	1.549	0.484	0.498	0.652
	(0.504)	(0.000)***	(0.000)***	(0.000)***	(0.054)*	(0.000)***	(0.667)	(0.715)	(0.461)	(0.886)		
89/1-91/12	0.008	0.800	0.544	0.002	-0.379	0.829	14.638	17.344	2.027	0.564	0.620	0.451
	(0.450)	(0.000)***	(0.000)***	(0.000)***	(0.090)*	(0.000)***	(0.262)	(0.137)	(0.363)	(0.831)		
90/1-92/12	0.003	0.884	0.316	0.001	-0.298	1.079	16.278	10.486	1.761	0.992	0.617	0.780
	(0.668)	(0.000)***	(0.094)*	(0.000)***	(0.001)***	(0.000)***	(0.179)	(0.573)	(0.414)	(0.509)		
91/1-93/12	0.014	1.068	-0.118	0.002	-0.348	0.991	14.697	6.019	1.151	0.579	0.504	0.644
	(0.061)*	(0.000)***	(0.300)	(0.000)***	(0.013)**	(0.000)***	(0.258)	(0.915)	(0.562)	(0.819)		
92/1-94/12	0.000	1.075	-0.215	0.003	-0.265	0.564	22.854	17.516	0.550	0.805	0.638	0.299
	(0.949)	(0.000)***	(0.023)**	(0.001)***	(0.001)***	(0.049)**	(0.029)**	(0.131)	(0.759)	(0.643)		
93/1-95/12	-0.004	1.198	-0.161	0.000	-0.162	1.096	13.749	19.978	1.111	0.637	0.755	0.935
	(0.291)	(0.000)***	(0.057)*	(0.000)***	(0.409)	(0.000)***	(0.317)	(0.068)*	(0.574)	(0.775)		
94/1-96/12	-0.007	1.206	-0.116	0.000	-0.036	1.144	10.173	5.117	2.798	0.443	0.676	1.108
	(0.226)	(0.000)***	(0.386)	(0.670)	(0.763)	(0.000)***	(0.601)	(0.954)	(0.247)	(0.911)		
95/1-97/12	-0.010	1.191	-0.182	0.000	-0.140	1.307	9.568	6.138	1.007	0.245	0.554	1.167
	(0.017)**	(0.000)***	(0.320)	(0.000)***	(0.489)	(0.000)***	(0.654)	(0.909)	(0.604)	(0.989)		
96/1-98/12	-0.049	0.641	1.532	0.009	-0.107	0.498	10.731	15.678	6.493	0.665	0.563	0.392
	(0.000)***	(0.000)***	(0.005)***	(0.317)	(0.138)	(0.474)	(0.552)	(0.206)	(0.039)**	(0.753)		
97/1-99/12	-0.042	0.680	1.348	0.008	-0.100	0.506	10.550	14.459	2.705	0.381	0.583	0.406
	(0.003)***	(0.000)***	(0.009)***	(0.475)	(0.157)	(0.582)	(0.568)	(0.272)	(0.259)	(0.944)		
98/1-00/12	-0.017	1.009	0.671	0.001	-0.174	0.945	20.034	8.504	1.490	0.674	0.539	0.771
	(0.208)	(0.000)***	(0.005)***	(0.000)***	(0.000)***	(0.000)***	(0.066)*	(0.745)	(0.475)	(0.746)		
99/1-01/12	-0.020	1.231	0.266	0.006	0.188	-0.185	60.674	6.622	0.938	0.760	0.704	0.003
	(0.163)	(0.000)***	(0.173)	(0.238)	(0.405)	(0.829)	(0.000)***	(0.882)	(0.626)	(0.679)		
00/1-02/12	-0.002	1.162	0.172	0.000	-0.175	1.096	15.731	12.514	0.919	0.665	0.630	0.921
	(0.832)	(0.000)***	(0.208)	(0.107)	(0.278)	(0.000)***	(0.204)	(0.405)	(0.632)	(0.753)		
01/1-03/12	0.022	0.677	0.407	0.000	-0.152	1.086	7.768	6.339	1.771	0.418	0.511	0.933
	(0.016)**	(0.000)***	(0.008)***	(0.305)	(0.476)	(0.000)***	(0.803)	(0.898)	(0.413)	(0.925)		
02/1-04/11	0.020	0.519	0.621	0.002	0.095	0.348	8.272	5.803	10.098	0.282	0.653	0.443
	(0.044)**	(0.004)***	(0.001)***	(0.632)	(0.731)	(0.763)	(0.764)	(0.926)	(0.006)***	(0.979)		
Full Sample	0.000	0.880	0.335	0.000	0.103	0.848	10.265	12.251	29.167	1.001	0.617	0.951
	(0.972)	(0.000)***	(0.007)***	(0.355)	(0.115)	(0.000)***	(0.593)	(0.426)	(0.000)***	(0.450)		

Note: The estimation is based on the Bollerslev-Wooldridge quasi-maximum likelihood robust method under the assumption of normal distribution. Figures in the parentheses are p-values. * denotes significance at the 0.10 level; ** denotes significance at the 0.05 level; and *** denotes significance at the 0.01 level.

The estimated conditional GARCH models are reported in Tables 8 to Table 12. Although the GARCH specification is statistically more superior, the findings are similar to those using the OLS model. Not all the ARCH and GARCH coefficients of the variance equation are significant. There are signs that the GARCH effects are more dominant compared to the ARCH effects. This implies that the volatility of the conditional TB-ICAPM model is more sensitive to the lagged volatility than to the new surprises in the market. A further observation from the conditional model is that the total ARCH and GARCH effect is nonstationary (explosive) when entering the crisis horizon, especially in the 1995-97 and1996-98 windows. They become abnormal or negative in some windows after that. This is happening consistently for all the countries. In Indonesia, the explosive volatility process continues to the 1997-99 window. The volatility of Malaysia does not stabilize well after the crisis in the 1999-2001 window. In Thailand, the explosive conditional variance occurs well before the crisis in the 1994-96 window. After the crisis, the sum of the ARCH and GARCH effects become very small generally for all the countries except Indonesia. The sum is just 0.198 in the 2001-03 window for Malaysia, 0.001 in the 2000-02 window for Philippines, 0.163 in the 2001-2003 window for Singapore, and 0.003 in the1999-2001 window for Thailand. The results indicate some instability in the volatility of the pricing process.

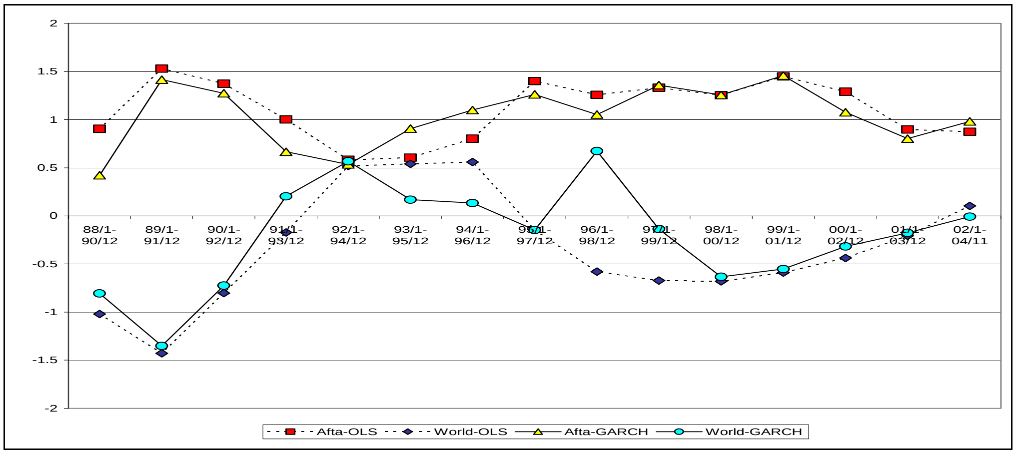
The diagnostic tests suggest that generally the TB-ICAPM model are well specified. The OLS estimations of the rolling regressions are acceptable and the GARCH estimation performs even better. Almost all of the linear and nonlinear dependency in the residuals are well captured in almost all of the windows. Except for a few cases, the Jarque-Bera test shows that the residual series are normality distributed and the ARCH-LM test also indicates no further ARCH effect. However, the GARCH estimation of the TB-ICAPM model for the full sample is clearly inadequate statistically. This is especially true for the pricing of Indonesia, Philippines and Thailand as there are signs of misspecification. The problem is possibly due to parameter instability.

The betas for the trading bloc factor and the world factor obtained from the rolling estimates are plotted in Figure 2. The pattern suggests that the pricing to both loading factors are instable across the sample period. Comparison of the magnitude of both the betas across the sample periods indicates that the pricing mechanism in Indonesia is most unstable among all. Although better than the case of Indonesia, the parameters in the other three emerging markets, i.e. Malaysia, Thailand and Philippines, are also not stable especially during the boom period prior to the 1997 crisis. Singapore is the only market with a relatively small range of beta values. The exposures of Singapore to both the loading factors are clearly stable, except for the window of 1995-97, the period entering the crisis.

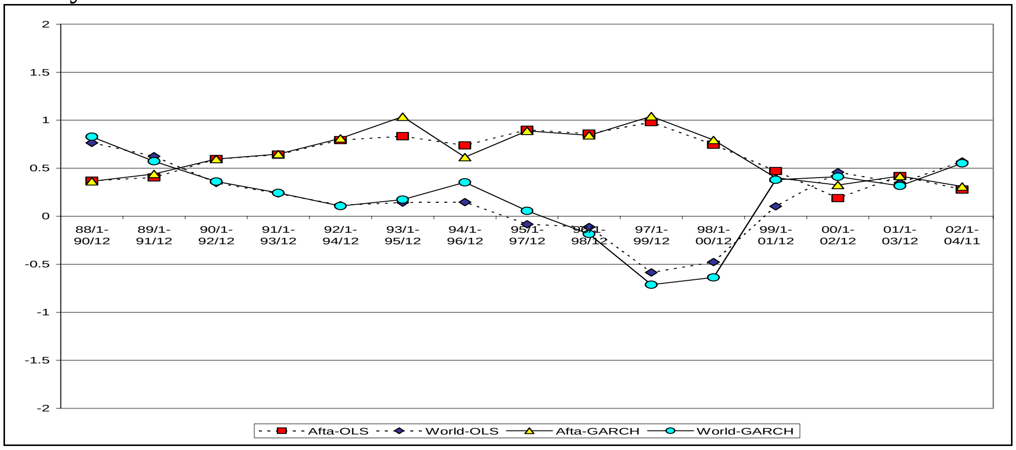
The pricing to the trading-bloc factor moves consistently in the opposite direction of that for the world factor for all five markets. Thus, countries that have a low world beta are likely to have higher exposure to the trading-bloc factor, whereas countries with a high world beta will tend to have lower trading bloc exposures. Specifically, the pricing to the trading-bloc factor is relatively higher in Indonesia in all the windows. This is true for Malaysia since 1990-92 until 1999-2001, Philippines in all windows except 1997-2000, and Thailand since 1989-91 except a few windows after 1994-96 until 2000-02. This implies that the pricing mechanism of these countries converge more to the AFTA bloc especially after 1992, the year in which the idea of AFTA was formalized. Singapore is the only exception where the exposure to the world factor is more prominent. This is not difficult to understand as Singapore has the most developed financial market and is the regional financial center after Japan and Hong Kong. Nevertheless, the pricing due to the trading-bloc beta in Singapore is only slightly lower than for the world beta, suggesting that the influence of AFTA to Singapore cannot be overlooked. Interestingly, the increasing importance of the trading bloc influence on the Malaysian stock market took a turn since the 1997-99 window. This is due possibly to the capital control policy implemented by the Malaysian government since September 1, 1998.

Figure 2: The Trading-Bloc and World Betas from the OLS and Conditional TB-ICAPM Model

Indonesia



Malaysia



Philippines

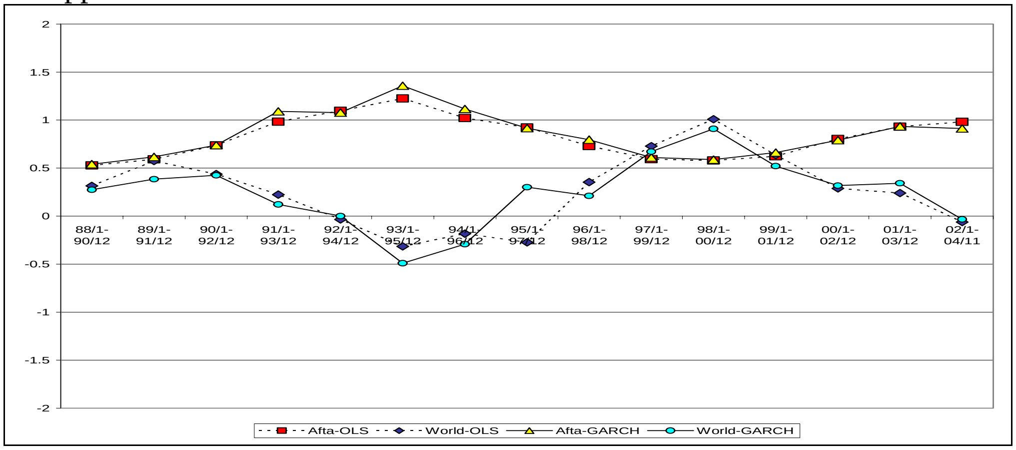
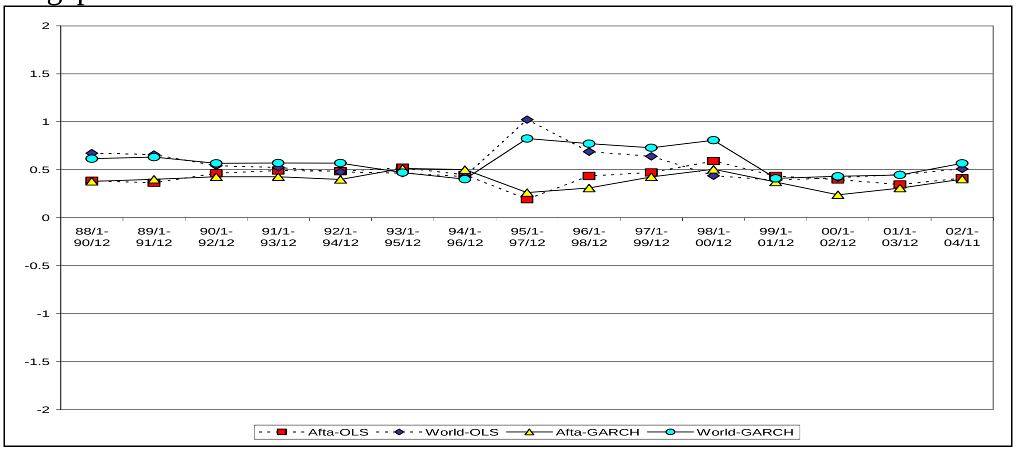
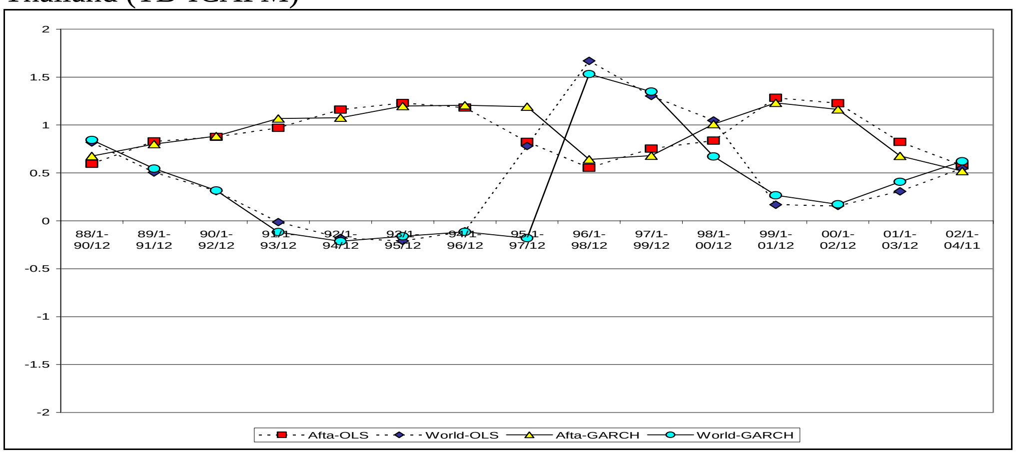


Figure 2: Trend of AFTA and World Betas in Static and Conditional TB-ICAPM Model (continued)

Singapore



Thailand (TB-ICAPM)



Although there are some mismatches, the estimated betas in both the OLS and conditional TB-ICAPM are very consistent. The trend of betas from the OLS and GARCH estimations coincides in almost every window, with the exception of two cases. The first is in the crisis windows for Indonesia, 1996-98 and 1997-99; where the OLS model might have significantly underestimated the world beta. For Thailand, in the 1995-97 window prior to the crisis, the OLS model overestimates the world beta.

5. Conclusion

This study investigates the impact of the trading bloc formed under AFTA on the stock pricing in the ASEAN-5 countries. This study proposes a direct modeling of trading bloc impact in the context of an international asset pricing model. In general, we find that ICAPM with a trading bloc factor has better fit and provides higher explanatory power of the stock market excess return compared to the conventional international asset pricing models. The parameter instability tests suggest that the pricing mechanism is not stable over time. Using rolling regression technique, we found that Singapore, being the most developed market, has a more stable pricing relationship. There is evidence of stronger trading bloc convergence relative to the world market convergence in AFTA, but the impact of the trading-bloc factor is less prominent in Singapore. Singapore is found to be more integrated with the world, but the magnitude of its trading-bloc factor estimates suggest that the impact of AFTA cannot be overlooked.

The main finding of this study is that the exposures to trade regionalism should not be neglected in international asset pricing model. The results offer evidence that the stock markets of the ASEAN-5 are more integrated within the trading bloc than into the global financial markets. As the impact of the trading-bloc factor moves in opposite direction with the world factor, this study suggests the rise of trade regionalism as another possible explanation for the cause of segmentation in emerging markets, at least in the AFTA. Further studies on the effect of other trading blocs on the stock pricing mechanism of their member countries are useful for confirming this proposition.

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