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Multiple Regime Shifts: The Influence of ASEAN Politics on Financial Integration within South-East Asia

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Abstract:

For the last two decades, a key policy objective of the Association of South East Asian Nations (ASEAN), to which it claims much success, has been the supra-national integration among the region's financial markets. This paper critically appraises this claim by locating and estimating multiple structural breaks in two equity market-based indicators and by employing a method to examine the effects of the ASEAN decision-making regime on variations in South-East Asian equity prices. The main findings of the paper are that the majority of identified structural breaks coincide with regime shifts in the ASEAN decision-making mechanism but that the politics of the regimes has had little influence on supra-national integration of the region's financial markets.

JEL Classification: F36, G12, G15, F42

Keywords: ASEAN, equity prices, financial markets, integration, politics, structural breaks.

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1. Introduction

The influence of politics in supra-national financial integration has been long-recognised as a determining factor in the outcome of such arrangements (Mundell, 1961; Haas, 1968). Methods developed to address this topic have approached the central hypothesis from subject-specific points of view and generated a sizeable amount of applied research predominantly based on the European Union (EU) case. However, the multi-dimensional nature of supra-national integration has prevented most subject-specific studies from adequately addressing the topic. Neo-functionalist work on the topic tended to be complex and expository, and approach the assessment of the influence of politics on economic variables through analysis of the frequency and nature of decision-making arising through supra-national institutions. Many studies suffered from several shortcomings that prevented the development of formal, universal models capable of analysing less institutionalised integration initiatives like those found outside of Western Europe.

Similarly, Optimum Currency Area (OCA) theorists developed several sophisticated models, measures and tools to assess supra-national integration. These included, among others, assessments of the long-term government bond yields, cross-sectional dispersion in bond yields, beta coefficients in equity markets and the convergence of underwriting fees and margins on lending in financial services (Berg *et al*, 2005). However, these models, measures and tools largely assumed a pre-existence of political willingness and an institutional means with which to engage in further financial integration. When applied outside of the confines of the structured and highly-institutionalised setting provided by its case study (traditionally the EU) their exploratory ability was limited when it came to addressing the influence of politics in other supra-national financial integrative initiatives. The Association of South East Asian Nations (ASEAN) is one such case in which its largely unstructured and non-institutionalised setting negates the use of traditional approaches to assess the influence of politics on supra-national financial integration.

The purpose of this paper is to analyse whether the politics of ASEAN is influencing the development of supra-national financial integration within South-East Asia's financial markets. To undertake such an analysis, a recent time series model developed by Bai and Perron (1998a) will be employed together with a methodology developed, on the same basis, by Caporale and Grier (2005a).

Bai and Perron (1998a) developed a highly powerful time-series model capable of estimating and testing for multiple structural breaks within a time-series. When utilised in conjunction with a political model comprising of several dummy variables, the Bai and Perron (1998a) model provides a robust means with which to analyse the influence of politics on an economic time-series.

There has been a limited use of time-series analysis on the political-economic aspects of integration. A notable study was undertaken by Caporaso and Pelowski (1971), who utilised a time-series based quasi-experimental analysis[2], within the context of European integration. In particular, Caporaso and Pelowski's (1971) analysis relied upon the use of an interrupted time-series design as part of a quasi-experimental analysis which, in econometric terms, identifies a structural break in a time series upon the introduction of an exogenous variable. Although Caporaso and Pelowski's (1971) concept was correct, their methodology possessed several major pitfalls, the two most significant being: the breaks in the time series were not determined endogenously[3] and, it was quasi-experimental. Chistiano (1992) demonstrates that a fundamental criteria for using standard sampling theory in testing time series for structural breaks is that the date of the structural break, if any, should be chosen independently of prior information about the data or some related series (i.e. endogenously). Chistiano (1992) argues that such a criterion is implausible, especially when it comes to applied research which largely depends on exogenous determination of a structural break. However, this fundamental criterion was met with the subsequent development of endogenously determined tests for structural breaks – such as that applied in this paper. Similarly, the fundamental weakness of quasi-experimental research is that

[2] Explained by Caporaso and Pelowski (1971) to be when the random assignment to treatment groups is not possible, and/or if the independent variable (or "event") is "socially given" i.e. not under experimental control.
[3] Endogenous determination of breaks is general methodological consensus of more recent time-series analysis.

the resultant analysis leaves much room for interpretation and debate. Both of these pitfalls are addressed through the use of the Bai and Perron (1998a) model and application of the Caporale and Grier (2005a) methodology[4].

Joint application of Bai and Perron (1998a) and Caporale and Grier (2005a) have been undertaken successfully in other fields of study in order to gauge the influence of politics/leadership on the variable under investigation. These joint applications are, however, few in number. In the case of Smyth and Narayan (2004)[5], the joint application was able to identify structural breaks in, and the effect of leadership on, the opinions of the High Court of Australia between 1904 and 2001. In Smyth and Narayan (2006), a similar joint application was capable of estimating the number and location of structural breaks in, and the effect of leadership on, the opinions of the US Supreme Court between 1800 and 1991. Caporale and Grier (2005a) used the joint application to test for the effect of political changes on monetary policy, based on shifts in the US and UK real interests rates between 1961-1994 and 1961-1999 respectively. In Caporale and Grier (2005b), the joint application was utilised to assess the effect of changes in political groupings on an interrelated "inflation regime" based on shifts in the US real interest rate between 1961 and 2000. Similarly, Rapach and Wohar (2005) utilised the joint application with nominal interest and inflation rate data, between 1960 and 1998, to analyse the effect of regime changes on the international real interest rates of 13 industrialised countries.

In all cases, the effect of politics (referred to as a regime) is assessed at a point in time at which a change occurs in the entity (referred to as regime change or leadership switch) that controls, in part or full, the decision-making process that underpins the variable utilised to estimate and locate the structural breaks. In the case of Smyth and Narayan (2004, 2006), regime changes were considered to be the change in the leadership of the court i.e. the Chief Justice. Caporale and Grier (2005a) considered regime changes to the leadership of either the executive branch of government or change in the directorship/chairmanship of the central monetary authority. Caporale and Grier (2005b) broadened their concept of regime change to include changes to a

[4] The Bai and Perron (1998a) model and Caporale and Grier (2005a) methodology are explained more formally later in the paper.
[5] Smyth and Narayan (2004) in their paper utilised the earlier, unpublished version of Caporale and Grier (2005a).

political party's control of the executive branch of government and changes in chairmanship of the central monetary authority. While Rapach and Wohar (2005), considered regime change to be the changes in the process governing the inflation rate and included changes in party control of the executive and legislative branches of government.

For the purposes of the analysis in this paper, the use of the term "regime" refers to the entity that controls, in part or full, the collective decision-making surrounding the process of financial integration within ASEAN; namely, the ASEAN Finance Ministers Meetings. A change in regime is considered to be the changes in leadership/chairmanship of the ASEAN Financial Ministers' Meetings and related entities[6]. The effect of the change in regime is gauged through the analysis of two equity market-based indicators between 1994 and 2007.

Consistent with the studies mentioned above, this paper approaches the topic in three stages. In the first stage, the stationarity of the data is investigated through the application of several unit root tests. In the second, provided the data is stationary, the Bai and Perron (1998a) model is applied to estimate and locate multiple structural breaks. In stage three, the Caporale and Grier (2005a) methodology is applied in order to analyse whether politics (as indicated through a change in regime) is influencing financial integration[7].

On this basis, the findings indicate that the majority of regimes under consideration do correspond with the break dates identified by Bai and Perron (1998a) and that their influence over financial integration has increased over time. However, the effect of the regime changes/switches of leadership has had negligible implications for the integration of South-East Asia's financial markets.

[6] The basis for this conceptualisation of regime and what constitutes a change in regime is discussed under a later section of this paper.
[7] The details of these test and the applications in this study are discussed later in the paper.

The remainder of this paper proceeds as follows: in Section 2 the ASEAN regime and its decision-making processes are investigated. In Sections 3 and 4, an overview of the data (used in this paper) is presented and their stationarity properties determined. In Section 5, an estimation of the number and location of structural break are undertaken, before, in Section 6, an analysis is made at to whether ASEAN's politics is influencing financial integration within South-East Asia financial markets.

2. Institutional Features of ASEAN

ASEAN was established through the Bangkok Declaration in 1967 and during the course of its existence expanded its membership to include 10 South-East Asian States. ASEAN as a regional institution has lacked many of the formal structures traditionally associated with regional integration initiatives[8] and has developed in accordance with its central ethos: consensus based decision-making. This has, under ASEAN's informal institutional framework, prevented the domination of any single member in the decision-making process and has, concomitantly, made any key ASEAN institutional features inextricably linked to the decision-making processes among its member States (Tan, 2003; Thambaipillai *et al*, 1985).

ASEAN's consensus-based decision-making is conducted via the members' Heads of State/Leaders or their Ministers. There are currently no Ambassadorial or equivalent representation at a regional/ASEAN level, meaning that ASEAN decisions and policies are negotiated between the members' governments prior to their proclamation through the ASEAN framework.

The official organisational structure of ASEAN is outlined in Figure 1. Initiated in 1992, the Heads of State/Leaders Summits (ASEAN SUMMIT) forms the highest decision making organ in ASEAN to which all other organs are subordinated. The frequency of Heads of State/Leaders

[8] Despite the introduction of the ASEAN Charter in 2007.

Summits was initially intended to be 3 years but has, since 1996, been held on an annual basis. Although regarded as the highest decision making organ, the Heads of State/Leaders Summits main function is to agree on, and proclaim, decisions and changes in policies. The actual policy and decision making executed through the ASEAN framework is made at the ministerial level and currently consists of 3 permanent annual ministerial meetings/groupings: the ASEAN Ministerial Meetings (AMM); the ASEAN Economic Ministers Meeting (AEM) and; the ASEAN Finance Ministers Meetings (AFMM) (Tan, 2003; ASEAN, 2004b).

Prior to 1992, the highest decision making organ in ASEAN was the AMM. The AMM comprised of the members' Foreign Ministers and was responsible for all aspects of policy formation and decision making for ASEAN. This role was shared in 1975 with the introduction of the AEM: the organ mandated with decision-making on all economic matters. In 1997, this role was shared further with the introduction of the AFMM which was established with the express purpose of:

"…concrete and pragmatic cooperation in the area of finance as a part of the building block to realise ASEAN's goal of greater economic integration." (ASEAN, 1997a)

The chairmanship/leadership of ASEAN's ministerial level meetings (AMM, AEM, and AFMM) rotates alphabetically by member on an annual basis. Each ministerial level meeting has attached a Senior Officials Meeting (SOM) - usually comprising of senior public servants in relevant fields - and various working groups that provide the mechanism for policy negotiations and decision-making when the ministerial meetings are not in session. The country holding the chair/leadership at the ministerial level meetings extends its leadership position for the period to its subordinated SOM. The only exception to the organisational structure is the Office of the Secretary General which is subordinated to the AMM and is mandated to assist in ASEAN's general administration and with the coordination of its activities. (Tan, 2003; ASEAN, 2004b).

Thus, for the purposes of the analysis in this paper, the "regime" under consideration refers to the entity that controls, in part or full, the collective decision-making surrounding the process of

financial integration within ASEAN, namely the AFMM (inclusive of its subordinated entities). Similarly, the change in leadership is considered to be the switch in chairmanship of the AFMM. Details of the chairmanship of the AFMM can be found in Table 1.

3. Overview of Data

The paper utilises two sets of time series data for its analysis, *viz.*:

1. The FTSE/ASEAN benchmark index ("benchmark index" or "FTSE/ASEAN series") – Figure 2;
2. The Invesco ASEAN Equity Fund ("equity fund" or "Invesco Series") – Figure 3.

Both sets of data, reported in US dollars, are available through the *Datastream* database and comprise of 5225 daily observations for the period of 1 January 1994 to 31 December 2007. In order not to exceed the limitations of current levels of computing power , the frequency of observations in both data sets were converted from a daily to weekly basis through the recordal of the observations on the Wednesday of each week. This produced two (independent) datasets of 730 weekly observations. The natural logarithms of the weekly observations were employed in all computations utilised in this paper.

The period between 1994 and 2007 is significant in the life of ASEAN as a regional integrative initiative. The period is inclusive of most of the time in which ASEAN has prioritised economic and financial integration on its political agenda and concomitantly concluded several enabling agreements that were intended to shape the Association in this regard.

The FTSE/ASEAN benchmark index is produced by the FTSE Company in association with five of ASEAN's members' stock exchanges[9]. The benchmark index covers 90 to 95 percent of the investable market capitalisation of ASEAN's 5 major economic markets which together account

[9] The five exchanges are: *PT Bursa Efek Jakarta* (Jakarta Stock Exchange) - Indonesia, *Bursa Malaysia Berhad -Malaysia*, The Philippine Stock Exchange, Inc. - Philippines, Singapore Exchange - Singapore and The Stock Exchange of Thailand - Thailand.

for the majority of ASEAN's productive capacity - approximately 91 percent of ASEAN's Gross Domestic Product (FTSE, 2006:6).

The Invesco ASEAN Equity Fund is a sub-fund of the unit trust known as the Invesco Funds Series 1. The objective of the equity fund is to achieve long-term capital growth through geographical asset allocation/investment in some or all of the ASEAN member countries. Asset allocation by country varies from time to time but the class of investable assets remain as listed equity or equity-related securities (including warrants and convertible securities) of companies which operate in or stand to benefit from their operations in and business links with ASEAN countries[10] (Invesco, 2008).

The use of the benchmark index and/or equity fund as the economic variable in the analysis has several advantages and constraints. The primary advantage of these economic variables is their composition as ASEAN focussed equity-based measures. This allows for the intended analysis of financial integration in ASEAN while still relying on a generally held assumption and a well specified theory[11]: politics matters when assessing financial integration and the Law-of-One-Price.

The Law-of-One-Price dictates that the prices of fully homogenous products across a single market are the same irrespective of the geographic domicile of the buyers and sellers[12]. This, in turn, implies minimised transportation or transaction costs. During the process of integration, prices of fully homogenous goods are expected to converge across traditionally segmented markets. Concomitantly, the associated transportation/transaction costs are expected to decline and converge (Ferrando & Vesala, 2005). It is on this basis that the Law-of-One-Price and its associated models are heavily relied upon for the assessment of integration (Mongelli, 2005). By convention and in terms of financial integration, the Law-of-One-Price prescribes a convergence

[10] Performance of the Invesco ASEAN equity fund is gauged relative to the Morningstar IM EQ ASEAN Index and not that of the FTSE/ASEAN benchmark index.
[11] As called for by Caporale and Grier (2005a) when applying their methodology.
[12] Traditionally regarded to be the outcome/end point of an integration arrangement.

of returns on similarly risky assets and a reduction and convergence of associated transaction costs[13] across traditionally segmented markets i.e. nil arbitrage. Reciprocally, the prices of similarly risky assets are expected to react to factors that are shared across the integrated financial market. In this regard, a fundamental shared factor is that of common information and has led to the development of indirect news-based measures of financial integration (Ferrando & Vesala, 2005). Bekaert and Harvey's (1997) study of emerging equity market volatility provides evidence of the link between the Law-of-One-Price and shared factors by demonstrating that the greater the degree of financial integration, the stronger the positive correlation between volatility of equity market returns and common information. Thus, for the purposes of this paper, the relationship between the Law-of-One-Price and common informational factors inherent to the politics of ASEAN will impact on volatility of equity returns in ASEAN's financial market. An analysis of which, over time, is expected to reveal how ASEAN politics is influencing supra-national financial integration within South-East Asia.

However, a central constraint remains in that suitable financial market-based integration indicators need to be identified for an ASEAN financial market that, in an institutional sense, does not yet exist. Generally, the availability of data covering indicators of financial integration in ASEAN are severely limited as many of the member States do not produce or release the relevant information and are not obliged to publicly report such data through the ASEAN initiative (even in light of the recent introduction of the ASEAN Charter).

To capture financial market integration in ASEAN, suitable indicators should be financial market based, limited in geographic scope and provide sufficient (preferably full) coverage of the market under investigation. The benchmark index and the equity fund meet these requirements and are the means with which to overcome the central constraint. As equity-based indicators, their structure covers a significant portion of the investable market (especially in the case of the benchmark index) and; can vary in investment composition and location (as in the case of the equity fund) but remain restricted to the ASEAN region. Despite their limitations, the benchmark index and the equity fund are suitable indicators of ASEAN equity market activity and provide

[13] Transportation costs of financial instruments if any are expected to have a nil effect.

data on a financial market that otherwise lacks a traditional institutional framework and reliable data reporting/communication mechanism.

Thus, albeit that the datasets do not provide full coverage of the investment environment of ASEAN, their similarities as ASEAN focussed equity measures and distinctions (a benchmark index and an unrelated equity fund) enables them to serve as good proxies for the purposes of this paper's analysis: to analyse whether the politics of ASEAN is influencing the development of supra-national financial integration within South-East Asia's financial markets.

4. Stationarity Properties of the Data

A pre-requisite of the Bai and Perron (1998a) model is to establish that the time-series under consideration is integrated of order zero or I(0) stationary. In order to determine stationarity of the data utilised in the analysis, a battery of standard unit-root tests were undertaken which included the standard Augmented Dickey Fuller (ADF), Philips-Perron (PP) and Kwiatkowski-Philips-Schmidt-Shin (KPSS) tests[14]. The results of these standard unit root tests are presented in Table 2. As Table 2 indicates, in each case, the series appear to be integrated of order one or I(1) i.e. non-stationary processes.

However, time series that appear to be non-stationary under standard unit-root tests may be break or trend break stationary once taking account of potential shifts (structural breaks) in the level and/or trend (Caporale and Grier, 2005a). This phenomenon was first explored by Perron (1989) who concluded that the inclusion of a structural break makes many macroeconomic variables trend stationary. However, Perron's (1989) approach included a break date exogenously – this went against the grain of subsequent research which, in turn, developed unit root tests that account for potential shifts in level and/or trend while determining multiple break dates

[14] Although all three tests are unit root tests and thus address stationarity properties of the data, more than one is traditionally reported as a means of comparison and confirmation of test results.

endogenously[15]. Caporale and Grier (2005a) argue that this phenomenon is particularly relevant when applying the Bai and Perron (1998a) model which itself identifies multiple structural breaks and thus automatically assumes that there is likely to be a shift in the level and/or trend of the series under investigation. Thus, although the standard unit root tests are informative, an augmented unit root test that accounts for potential shifts in the level and/or trend and determines break dates endogenously is required.

In this vein, an augmented KPSS test developed by Carrion-i-Silvestre *et al* (2005) was applied to the time-series under consideration. The Carrion-i-Silvestre *et al* (2005) KPSS test provides two advantages over the tests mentioned above *viz.*:

1. It is a KPSS test and thus considers a null hypothesis of stationarity, which is argued to be a more natural hypothesis for many economic problems, and;
2. It can accommodate more than two breaks when assessing the stationarity qualities of a series - a likely phenomenon when testing long-term time-series[16].

The Carrion-i-Silvestre *et al* (2005) KPSS test is designed to test for stationarity of a panel while taking account of potential multiple structural breaks. Carrion-i-Silvestre *et al*'s (2005) KPSS test is thus intended for direct application with a panel, which is not the case in this paper's analysis of two univariate time series. However, the Carrion-i-Silvestre *et al* (2005) KPSS test is an extension of Hadri (2000) stationary panel test that produces a test statistic that utilises the average of the univariate KPSS stationarity tests proposed by Kwiatowski *et al* (1992)[17] . This means that for the purposes of this paper's analysis, one-half of the Carrion-i-Silvestre *et al* (2005) KPSS test can be utilised to assess stationarity properties of the univariate time-series under consideration, while still taking into account the possibilities of multiple structural breaks. The Carrion-i-Silvestre *et al* (2005) KPSS test allows for two forms referred to as Model 1 and

[15] Notable studies in this regard include, among others: Zivot and Andews (1992) single-break unit root test, Lumsdaine and Papell (1997) two break unit root test and Lee and Strazicich (2004) minimum Lagrange-Multiplier one and two break unit root tests.
[16] See Lumsdaine and Papell (1997) critique of endogenous break literature and Libanio (2005) for an overview of unit root testing for macroeconomic time series.
[17] Refer to Carrion-i-Silvestre (2005) for further details as to the linkage between these papers.

Model 2. For the purposes of this paper's analysis Model 2 is applied due to our use of trending regressors and, as Carrion-i-Silvestre *et al* (2005) note, is the counterpart to Perron's (1989) Model C[18].

The Carrion-i-Silvestre *et al* (2005) KPSS test defines the model to test the null hypothesis of stationarity while allowing for two different types of multiple structural break effects by:

$$y_{i,t} = \alpha_i + \sum_{k=1}^{m_i} \theta_{i,k}\, DU_{i,k,t} \; + \; \beta_t + \sum_{k=1}^{m_i} \gamma_{i,k}\, DT^*_{i,k,t} + \varepsilon_{i,t} \qquad (1)$$

where *DU* is the indicator dummy variable for a mean shift *k* at time *t* and *DT* is the indicator dummy variable for the trend shift *k* at time *t*. Thus, where:

$$DU_{i,k,t} = \begin{cases} 1 & \text{for } t > T^i_{b,k} \\ 0 & \text{otherwise} \end{cases} \qquad DT^*_{i,k,t} = \begin{cases} t - T^i_{b,k} & \text{for } t > T^i_{b,k} \\ 0 & \text{otherwise} \end{cases}$$

Based on Hadri (2000), Carrion-i-Silvestre *et al* (2005) express the Lagrange multiplier (LM) test statistic as:

$$LM(\lambda) = N^{-1} \sum_{i=1}^{N} \left(\widehat{\omega}_i^{-2} T^{-2} \sum_{t=1}^{T} \hat{S}^2_{i,t} \right) \qquad (2)$$

and

(3)

[18] Perron (1989) Model C:

$$y_t = \hat{\mu} + \hat{\theta} DU_t \; + \hat{\beta}_t + \hat{\gamma} DU_t \; + \hat{d} D(TB)_t \; + \hat{\alpha} y_{t-1} \; + \sum\nolimits_{j=1}^{k} \hat{c}_j \, \Delta y_{t-1} + \hat{e}_t$$

$$\hat{S}_{i,t}^{2} = \sum_{j=1}^{t} \hat{\varepsilon}_{i,j}$$

where S denotes the partial sum process obtained using the estimated ordinary least squares residuals of (1), ω is a consistent estimate of long-run variance and λ denotes the dependence of the test on dates of the break.

In order to estimate the break dates required by the test, Carrion-i-Silvestre *et al* (2005) suggest the Bai and Perron (1998a) method to select the estimate of the dates of the breaks that minimise the individual series sum of squared residuals (*SSR*). To under take this estimation, a trimming region and a maximum number of breaks (*Mmax*) need to be specified. The choice of trimming, as noted by Carrion-i-Silvestre *et al* (2005), is considered to be arbitrary. For the purposes of this paper's analysis a trimming of [0.10T, 0.90T] and *Mmax*=8 were specified. The results of the application of the Carrion-i-Silvestre *et al* (2005) test to the univariate time series are presented in Table 3.

As Table 3 indicates, both series utilising Carrion-i-Silvestre *et al*'s (2005) Model 2 (i.e. allowing for breaks in the intercept and trend) prove to be break-point stationary. Carrion-i-Silvestre *et al* (2005) recommend that when including trending regressors, as in Model 2, the number of structural breaks should be estimated utilising the modified Schwartz information criteria (LWZ). This recommendation is adopted in the application of the Bai and Perron (1998a) model below.

5. Number and Location of Break Dates

As the stationarity properties of the two univariate sets of data have been established to be break-point stationary an application of the Bai and Perron (1998a) model was undertaken. The Bai and Perron (1998a) model provides a means with which to test for, and estimate, multiple structural changes in a stationary time series. The Bai and Perron (1998a) model is a highly versatile and powerful test, which produces a set of confidence intervals for the estimated multiple structural

changes of a time series – the utility of this aspect of the model is discussed in the next section of the paper.

The Bai and Perron (1998a) model considers a multiple linear regression model with *m* breaks and *(m+1)* regimes:

$$y_t = \acute{x}_t\beta + \acute{z}_t\delta_{m+1} + u_t, \qquad t = Tm + 1, \dots, T \qquad (4)$$

where y_t is the observed dependent variable at time *t*; *x (p* x *1)* and *z (q* x *1)* are vectors of covariates and β and δ_j $(j = 1, \dots, m+1)$ are the corresponding vectors of coefficients; *u* is the disturbance at time *t*. The break points, indices $(T_1, \dots, T_m)$, are explicitly treated as unknown.

The purpose of the Bai and Perron (1998a) model is to estimate the unknown regression coefficients along with the unknown break points. This is undertaken through least squares estimation of the vectors of coefficients by minimising the sum of squared residuals for each *m-partition* $(T_1, \dots, T_m)$ and then by substituting the estimated vectors of coefficients into the objective function (4) which provide the estimated break points $(\check{T}_1, \dots, \check{T}_m)$. Thus, Bai and Perron (1998a) conclude that the break-point estimators are the global minimisers of the objective function[19] i.e. the global minimisers of the sum of squared residuals.

The Bai and Perron (1998a) model provides several F-test statistics in this regard that are intended to aid in the detection of any (multiple) breaks[20]. These are the *SupFt(L)* test statistic and the Double Maximum test which include the *UDmax* and *WDmax* test statistics. *SupFt(L)* test statistic determines the existence of m-number breaks in the series by searching for all possible break dates and minimising the difference between the restricted and unrestricted sum

[19] Bai and Perron (1998a) utilise an algorithm based on the principle of dynamic programming to compute the estimates of the breakpoints which are the global minimizers of the sum of squared residuals – refer to Bai and Perron (1998b) for further details.
[20] See Smyth and Narayan (2004) and Caporale and Grier (2005a) for succinct explanations of the F-test statistics utilised by Bai and Perron (1998a).

of squares over all the potential breaks (Caporale and Grier, 2005a). The *SupFt(L)* test consider the null hypothesis of no structural breaks *(m = 0)* against the alternate hypothesis of *m = k* breaks. A *SupFt(L)* test is thus produced for k-potential breaks together with their appropriate critical values.

The Double Maximum test considers the null of no structural break *(m = 0)* against the alternative hypothesis of an unknown number of breaks given some upper bound *M* (i.e. at least 1 through *M* breaks). The *UDmax* statistic is the maximum value of the *SupFt(L)* test, discussed above, where *L* is the upper bound of the possible number of breaks, whereas the *WDmax* test statistic applies weights to the individual tests in order to equalise the p-values across values of *m*.

The Bai and Perron model then determines the optimal number of break dates through the application of three modes, *viz.*: a sequential procedure (or *SupFt(L+1|L)* tests), Bayesian information criteria (BIC) and a modified Schwartz information criteria (LWZ). Bai and Perron (1998a) suggest that, provided that the *SupFt(L)* and Double Maximum tests indicate a rejection of the null hypothesis of no structural breaks, a determination of the optimal number of break dates be undertaken using a sequential procedure. Most literature employing the Bai and Perron (1998a) model, such as Caporale and Grier (2005a; 2005b), Rapach and Wohar (2005), Smyth and Narayan (2004; 2006), utilise the sequential procedure to determine the optimal number of breaks and cite Bai and Perron's (1998a, 1998b, 2003) findings that the sequential procedure out performs the BIC or LWZ information criteria. However, Carrion-i-Silvestre *et al* (2005) recommend that when including trending regressors, as the case in this paper, preference should be given to LWZ in estimating the optimal number of structural breaks.

Before applying the Bai and Perron (1998a) model, and apart from establishing that the underlying data is stationary, it is required that an initial trimming region/percentage must be specified in order to ensure that an adequate number of degrees of freedom are available to

calculate the initial error sum of squares. The trimming region/percentage also determines the maximum permissible number of breaks (*m*) and maximum number of regimes (*m+1*).

In the case of this paper's analysis, based on the application of the Bai and Perron model by others (e.g. Timmerman, 2001) to estimate and locate multiple structural breaks in an equity-based time series, a trimming region of [0.10T, 0.90T] or 10 percent and m = 8 was specified. This results in a segment length (*h*) of 73 observations.

The results of the application of the Bai and Perron (1998a) model to the benchmark index and equity fund are presented in Tables 4 and 5. Note that the critical values for each of the statistics are provided by Bai and Perron (1998a).

As Table 4 indicates, for the FTSE/ASEAN (benchmark index) the *SupFt(L)* test is statistically significant at the 1 percent level for the values of *L* between 2 and 8, while for the Invesco (equity fund) the *SupFt(L)* test is statistically significant at the 5 percent level for *L* = 2 and at the 1 percent level for the values of *L* between 3 and 8. The *UDmax* and *WDmax* statistics are significant at the 1 percent level for both the FTSE/ASEAN and Invesco series. These results imply that there are at least two structural breaks in the FTSE/ASEAN and Invesco series.

Table 5 reports the results of the modified Schwartz information criteria (LWZ) on the FTSE/ASEAN and Invesco series. As mentioned above, the LWZ information criterion has been applied due to the inclusion of trending regressors. The application of the LWZ method selected 6 breaks in each series. The break points and their corresponding break dates are also presented in Table 5. The series have 3 corresponding break dates: 15 October 1997, 14 April 1999 and 2 August 2006, while the remaining 3 break dates are estimated to occur within 1 to 6 weeks of each other. The estimated confidence intervals in both series are not tightly estimated, spanning between 84 and 160 weeks for the FTSE/ASEAN series and between 47 and 188 weeks for the Invesco series. Overall, the Invesco series presented a tighter estimation of the confidence intervals.

6. Influence of Politics on Break Dates

Caporale and Grier (2005a) investigate the use of dummy variables in testing for the influence of politics on economic policies or outcomes. Caporale and Grier (2005a) emphasize that much of the literature investigating the influence of political variables on economic variables (and *vice versa*) suffer from the lack of a well-defined null hypothesis as to the pattern of political influence.

In order to correct for this deficiency, Caporale and Grier (2005a) demonstrate a methodology that relies upon the confidence intervals generated from the application of the Bai and Perron (1998a) model. The assessment of the influence of political variables on economic variables is determined by how the break dates generated from the political dummy variables (referred to as an intercept shift model or political model) fit with the break dates determined through the application of the Bai and Perron (1998a) model to the economic variable (referred to as the intercept-shifting model or economic model). This is analogous to taking two parallel time lines – the political variable on one and the economic variable on the other – and comparing how well the dates on which their intercept shifts overlap.

To this end, Caporale and Grier (2005a) provide criteria with which to determine whether the shifts in the political model can be considered to be statistically significant events. For a strong significance, Caporale and Grier (2005a) conclude the number of regimes implied by the political model (in this case the political dummy variables) must equal the number implied by the economic time series model (i.e. the application of the Bai and Perron(1998a) model); and that each of the political break points (point of regime change) falls inside the confidence intervals produced by the Bai and Perron model. This would provide strong evidence in favour of the primacy of the political influence. Should there only be a partial match between the political breaks and the breaks in the time series model, then Caporale and Grier (2005a) purport that the influence of politics can still be argued but becomes a matter open to interpretation.

On this basis, Caporale and Grier (2005a) argue that a well-specified theory is essential to overcome any potential limitations posed by the use of the Bai and Perron (1998a) model. As mentioned above, the paper relies upon the use of the Law-of-One-Price and the generally accepted assumption that politics does matter when assessing financial integration.

The AFMM regimes and their political break points over the period 1997-2008 are outlined in Table 1. The major reported events of each of these regimes are considered. Beginning with the 1st AFMM Chairmanship, the Lao PDR and Myanmar were admitted to the ASEAN Finance Ministers' Meetings following their accession to ASEAN. ASEAN proclaimed several policy initiatives designed to improve economic and technical cooperation, transparency and stability of its members' financial markets which included: improving prudential standards and the introduction of a regional/cooperative financing arrangement designed to supplement the resources available from the International Monetary Fund and other international institutions (ASEAN 1997a, 1997b).

During the 2nd AFMM Chairmanship, ASEAN implemented the ASEAN Surveillance Mechanism which was intended to assist policy making between the members through the monitoring of various macroeconomic indicators and information sharing (ASEAN, 1998; Rana, 2002). Balance of payments arrangements were entered into between Malaysia and the Philippines and similar arrangements were under negotiation between Malaysia and Thailand and Malaysia and Indonesia (ASEAN 1998a, 1998b). The 1st round of negotiations on the liberalisation of the financial services sector was also concluded during this regime (ASEAN, 2001).

The 3rd AFMM Chairmanship witnessed the introduction of ASEAN's position on reform of the international financial architecture and an emphasis by the members to encourage the financial recovery of the region following on from the then recent Asian Financial Crisis (ASEAN, 1999a) and the acceleration of the expected implementation of the ASEAN Investment Area- ASEAN's mechanism for the establishment of a common market for investment (ASEAN 1999b; ASEAN,

2006b). ASEAN also expanded its scope of financial cooperation with its '+3' partners (China, Japan and Korea) to include collaboration on monetary and fiscal/financial issues (ASEAN, 1999b).

The 4th AFMM Chairmanship saw the establishment of working committees for the adoption and implementation of internationally accepted practices and standards and for cooperation on tax and public finance. During this Chairmanship, the ASEAN+3[21] finance and central bankers, as part of mutual financial assistance, established a research and training mechanism, a network through which to conduct regional financial surveillance and agreed to undertake a study into the modalities and mechanisms for a regional financing arrangement (ASEAN, 2000a). ASEAN also took steps in this period to expand its ASEAN Swap Arrangements to include all ten member nations and introduced a related bilateral swap arrangement for the ASEAN+3 members (ASEAN, 2000b) – together, this would be later known as the Chiang Mai Initiative.

Under the 5th AFMM Chairmanship ASEAN expanded its surveillance mechanism to include participation by its '+3' partners and intensifying the training of its officials in this regard through the Asian Development Bank (ASEAN, 2001). In this period, the 2nd round of negotiations on the liberalisation of the financial services sector was concluded and the Bilateral Swap Arrangements under the Chiang Mai Initiative were expanded (ASEAN, 2002). During the 6th AFMM Chairmanship the ASEAN Swap Arrangements were renewed and new Bilateral Swap Arrangements under the auspices of the Chiang Mai Initiative were negotiated (ASEAN, 2003).

Under the 7th AFMM Chairmanship, the "Roadmap for Integration of ASEAN in Finance" – ASEAN's proposal to achieve financial integration – was concluded and adopted by the members. The Bilateral Swap Arrangements under the auspices of the Chiang Mai Initiative were expanded. ASEAN's priority areas in integrating in finance became: institutional capacity

[21] ASEAN+3 is a grouping of nations that include the 10 member States of ASEAN and those of the '+3 partners': China, Japan and the Republic of Korea.

building (both legal and regulatory), capital market collaboration (training and harmonisation of standards), capital account liberalisation and currency cooperation (as opposed to adopting a common currency) for the purposes of regional trade and economic integration (ASEAN, 2003).

During the 8th AFMM Chairmanship the ASEAN Swap Arrangements[22] were expanded from US$ 1 billion to US$ 2 billion and the Asian Bond Market Initiative succeeded in launching the first of it local currency denominated bonds. The 3rd round of negotiations on the liberalisation of the financial services sector was concluded (ASEAN 2004a, 2005).

The 9th AFMM Chairmanship ASEAN announced its intention to develop an interlinked ASEAN securities market by 2010 that would enable freer flow of capital, harmonise standards and practices and improve overall market liquidity (ASEAN, 2005). The period of the 10th AFMM Chairmanship had few significant developments with the launch of the FTSE/ASEAN Index intended to serve as a catalyst for further integration of ASEAN members' stock markets (ASEAN, 2006a). While under the 11th AFMM Chairmanship, ASEAN announced the establishment of a "bond portal" and information resources intended to provide a centralised platform of information on ASEAN's bond markets (ASEAN, 2007).

When comparing the Bai and Perron (1998a) model's break dates in Table 5 with the AFMM regime break dates in Table 1, it is immediately revealed that there is not an exact match of regimes or regime changes in either model. This is peculiar to the case under investigation and, as discussed above, is largely due to the fact that ASEAN's leadership changes occur on an annual basis. However, it is still possible to assess whether the political break points fall inside the confidence intervals produced by the application of the Bai and Perron (1998a) model i.e. a partial match. The influence of ASEAN politics on financial integration can then still be argued but becomes a matter open to interpretation.

[22] The ASEAN swap arrangements or ASAs are short-term liquidity arrangements among the members of ASEAN.

Further comparison of Tables 1 and 5 reveals that none of the 10 AFMM regime changes/switches occur on the break dates identified in either of the series analysed with the Bai and Perron (1998a) model. However, 7 to 8 of the 10 AFMM regime changes/switches fall within the 95 percent confidence intervals produced in either series indicating a partial match between the political breaks and the Bai and Perron (1998a) breaks.

The 7 AFMM leadership (chairmanship) switches corresponding with the Bai and Perron (1998a) break dates for the FTSE/ASEAN series are: the switch from 1st to 2nd AFMM Chairmanships (28 February 2008); 2nd to 3rd and 3rd to 4th AFMM Chairmanships (20 March 1999 and 25 March 2000); 6th to 7th, 7th to 8th and 8th to 9th AFMM Chairmanships (6 August 2003, 7 April, 2004, 6 April 2005) and 8th to 9th and 9th to 10th AFMM Chairmanships (6 April 2005 and 5 April 2006).

Similarly, the 8 AFMM leadership (chairmanship) switches corresponding with the Bai and Perron (1998a) break dates for the Invesco series are: the switch from 1st to 2nd AFMM Chairmanships (28 February 2008); 2nd to 3rd and 3rd to 4th AFMM Chairmanships (20 March 1999 and 25 March 2000); 3rd to 4th and 4th to 5th AFMM Chairmanships (25 March 2000, 07 April 2001), 6th to 7th and 7th to 8th AFMM Chairmanships (6 August 2003, 7 April, 2004); 7th to 8th and 8th to 9th AFMM Chairmanships (7 April, 2004, 6 April 2005) and the 9th to 10th AFMM Chairmanships (5 April 2006).

Smyth and Narayan's (2006) application of the Caporale and Grier methodology (when faced by a similar partial match and knowledge of more than one break) demonstrated that the coefficients (in our case the δ-coefficients) indicate which regime change/switch in leadership had the largest effect (by magnitude) on the underlying economic variable and argue that with the knowledge of such break points we are able to deduce the importance of leadership change leading to a break i.e. the magnitude of the delta coefficient following a break in the economic time series, indicates the effect of the corresponding regime change/switch in the political model.

On this basis, Table 5 outlines the δ-coefficients of the FTSE/ASEAN and Invesco series. For the FTSE/ASEAN series, the effects of the regime changes/switches in leadership correspond to (by magnitude in descending order): δ7 associated with break 6 is the largest in magnitude followed δ6 associated with break 5; δ3 associated with break 2; δ5 associated with break 4; δ4 associated with break 3 and δ2 associated with break 1.

For the Invesco Series, the story is similar as the effects of the regime changes/switches in leadership correspond to (by magnitude in descending order): δ7 associated with break 6 is the largest in magnitude followed δ6 associated with break 5; δ3 associated with break 2; δ5 associated with break 4; δ2 associated with break 1and δ4 associated with break 3.

Based on the magnitude of the δ-coefficients alone, it is apparent that the influence of the ASEAN finance ministers over the integration of ASEAN members' financial markets has been greater in recent years. This is indicated by the increase in the magnitude of the δ-coefficient following each break. However, the magnitude of the δ-coefficients do not significantly vary from one break to the next, which indicates that the influence of a switch in regime is marginal. Together this implies that, although the influence of ASEAN finance ministers has increased in recent years, the effect of a regime change/switch of leadership of ASEAN finance ministers has had negligible implications for financial integration between the member nations' financial markets.

7. Conclusion

The purpose of this paper was to analyse whether the politics of ASEAN (as represented by the ASEAN Finance Ministers) is influencing the development of supra-national financial integration within South-East Asia's financial markets (as represented by the FTSE/ASEAN and Invesco series). To this end, the Bai and Perron (1998a) model was employed together with a methodology developed, on the same basis, by Caporale and Grier (2005a) while relying upon the theoretical basis provided by the Law-of-One-Price and the generally accepted assumption that politics do matter when assessing financial integration.

The findings indicated that none of the 10 AFMM regime changes/switches provided a perfect match with the break dates identified in either of the series analysed. However, 7 to 8 of the 10 AFMM regime changes/switches fell within the 95 percent confidence intervals and thus indicated a partial match between the political and economic breaks.

When compared with the δ-coefficients of the economic series considered in the paper it was found that the effects of the regime changes/switches in leadership corresponded in both series and that although the influence of ASEAN finance ministers has increased in recent years, the effect of regime changes/switches of leadership of ASEAN finance ministers has had a negligible implication for the integration of the member nations' financial markets.

This provides evidence that the politics of ASEAN has had little bearing on the development of supra-national financial integration among South-East Asia's financial markets and that much of the 'significant strides' made toward financial integration as championed by ASEAN, thus far, appears to be political-rhetoric. This paper's analysis, however, was limited to the regime represented by the ASEAN Finance Ministers meetings. Other political groups within ASEAN, although of less importance in terms of financial integration, may prove to have different effects on integration of South-East Asia's financial markets: a subject for future research.

References

ASEAN = ASEAN Secretariat

ASEAN Secretariat (1997a), "Joint Press Communiqué of the First ASEAN Finance Ministers Meeting", Phuket, Thailand, 1 March, viewed 06 November 2008, <http://www.aseansec.org/2457.htm>

ASEAN Secretariat (1997b), "Joint Ministerial Statement of the Special ASEAN Finance Ministers Meeting", Kuala Lumpur, Malaysia, 1 December, viewed 06 November 2008, <http://www.aseansec.org/2460.htm>

ASEAN Secretariat (1998), "Joint Press Statement of the 2nd ASEAN Finance Ministers Meeting", Jakarta, Indonesia, 28 February, viewed 06 November 2008, <http://www.aseansec.org/2267.htm>

ASEAN Secretariat (1999a), "Joint Ministerial Statement of the 3rd ASEAN Finance Ministers Meeting", Ha Noi, Viet Nam, 20 March, viewed 06 November 2008, <http://www.aseansec.org/2271.htm>

ASEAN Secretariat (1999b), "Joint Ministerial Statement of the Special ASEAN Finance Ministers Meeting", Manila, Philippines, 25 November, viewed 06 November 2008, <http://www.aseansec.org/5429.htm>

ASEAN Secretariat (2000a), "Joint Ministerial Statement of the 4th ASEAN Finance Ministers Meeting", Bandar Seri Begawan, Brunei Darussalam 25-26 March, viewed 06 November 2008, <http://www.aseansec.org/634.htm>

ASEAN Secretariat (2000b), "Joint Ministerial Statement of the Special ASEAN Finance Ministers Meeting", Prague, Czech Republic, 25 September, viewed 06 November 2008, <http://www.aseansec.org/636.htm>

ASEAN Secretariat (2001), “Joint Ministerial Statement Fifth ASEAN Finance Ministers Meeting”, Kuala Lumpur, Malaysia7-8 April, viewed 06 November 2008, <http://www.aseansec.org/1121.htm>

ASEAN Secretariat (2002), “Joint Ministerial Statement Sixth ASEAN Finance Ministers Meeting, Yangon”, Myanmar, 5-6 April, viewed 06 November 2008, <http://www.aseansec.org/7925.htm>

ASEAN Secretariat (2003), “Joint Ministerial Statement Seventh ASEAN Finance Ministers’ Meeting”, Makati, Philippines, 6-7 August, viewed 06 November 2008, <http://www.aseansec.org/15029.htm>

ASEAN Secretariat (2004a), “Joint Ministerial Statement 8th ASEAN Finance Ministers’ Meeting”, Singapore, 7 April, viewed 06 November 2008, <http://www.aseansec.org/16062.htm>

ASEAN Secretariat (2004b), “Organisational Structure of ASEAN”, viewed 06 November 2008, <http://www.aseansec.org/13103.htm>

ASEAN Secretariat (2005), “Joint Ministerial Statement of the 9th ASEAN Finance Ministers’ Meeting”, Vientiane, 6 April, viewed 06 November 2008, <http://www.aseansec.org/17405.htm>

ASEAN Secretariat (2006a), “Joint Ministerial Statement of the 10th ASEAN Finance Ministers’ Meeting”, Siem Reap, 5 April, viewed 06 November 2008, <http://www.aseansec.org/18353.htm>

ASEAN Secretariat (2006b), “ASEAN Investment Area: An Update”, viewed 06 November 2008, <http://www.aseansec.org/11461.htm>

ASEAN Secretariat (2007), “Joint Ministerial Statement of the 11th ASEAN Finance Ministers’ Meeting Chiang Mai”, Thailand, 5 April, viewed 06 November 2008, <http://www.aseansec.org/20472.htm>

Bai, J & Perron, P, (1998a) "Estimating and Testing Linear Models with Multiple Structural Changes," *Econometrica*, Econometric Society, vol. 66, no.1 (Jan.), pp. 47-78

Bai, J & Perron, P (1998b) "Computation and Analysis of Multiple-Structural-Change Models," Working Paper presented to Econometric Society, (Sep.)

Bai, J & Perron, P, (2003) "Computation and Analysis of Multiple Structural Change Models," *Journal of Applied Econometrics*, John Wiley & Sons, Ltd., vol. 18, no. 1, pp. 1-22

Bekaert, G & Harvey, G (1997), "Emerging equity market volatility", *Journal of Financial Economics*, vol. 43, no. 1, (Jan.), pp. 29-77

Berg, J, Grande, M & Mongelli, F (2005) *Elements of the Euro Area: Integrating Financial Markets*, Ashgate, Great Britain

Caporale, T & Grier, K (2000) "Political Regime Change and the Real Interest Rate", *Journal of Money, Credit and Banking*, vol. 32, no. 3 (Aug.), pp. 320-334

Caporale, T & Grier, K (2005a) "How Smart Is my Dummy? Time Series Tests for the Influence of Politics", *Political Analysis,* vol. 13, pp. 77-94

Caporale, T & Grier, K (2005b) "Inflation, Presidents, Fed Chairs, and Regime Shifts in the U.S. Real Interest Rate", *Journal of Money, Credit, and Banking*, vol. 37, no. 6 (Dec.), pp. 1153-1163

Caporaso, J & Pelowski, A (1971) "Economic and Political Integration in Europe: A Time-Series Quasi-Experimental Analysis" *The American Political Science Review*, vol. 65, no. 2 (Jun.), pp. 418-433

Carrion-i-Silvestre, J Ll., del Barrio, T and López-Bazo, E (2005): "Breaking the Panels: An Application to GDP per capita", *Econometrics Journal*, vol. 8, pp. 159-175

Ferrando, A & Vesala, J (2005) "Concepts and Measures of Financial Integration" in Berg, J, Grande, M & Mongelli, F (eds) *Elements of the Euro Area: Integrating Financial Markets*, Ashgate, Great Britain

FTSE (2006) "FTSE/ASEAN Index Series: Tradable and Benchmark Indices for South East Asia", Research Report 2nd Edition, 27 July

Haas, E (1968) *The Uniting of Europe: Political, Social, and Economic Forces, 1950-1957*, Stanford University Press, Stanford, California, USA

Hadri, K (2000) "Testing for stationarity in heterogeneous panel data" *Econometrics Journal* vol. 3, pp. 148–61

Invesco (2008) "Invesco Funds Series 1: Invesco ASEAN Equity Fund", *Simplified Prospectus,* 18 April

Lee, J & Strazicich, M (2004) "Minimum LM Unit Root Test with One Structural Break", Department of Economics, Appalachian State University

Libanio, G (2005) "Unit roots in macroeconomic time series: theory, implications, and evidence" *nova Economia Belo Horizonte* vol. 15, no. 3 (Sep.-Dec.), pp. 145-176

Lumsdaine, R & Papell, D (1997) "Multiple Trend Breaks and the Unit-Root Hypothesis" *The Review of Economics and Statistics*, vol. 79, no. 2 (May), pp. 212-218

Mongelli, F (2005) "What is European Economic and Monetary Union Telling us About the Properties of Optimum Currency Areas?", *Journal of Common Market Studies*, vol. 43, no. 3, pp. 607–35

Mundell, R (1961) "A Theory of Optimum Currency Areas", *The American Economic Review*, vol. 51, no. 4, pp. 657-665

Perron, P (1989) "The Great Crash, the Oil Price Shock, and the Unit Root Hypothesis" *Econometrica*, vol. 57, no. 6 (Nov.), pp. 1361-1401

Rana, P (2002), 'Monetary and Financial Cooperation in East Asia: The Chiang Mai Initiative and Beyond', *ERD Working Paper Series*, Asian Development Bank, no. 6 (Feb.)

Rapach, D & Wohar, M (2005) "Regime Changes in International Real Interest Rates: Are They a Monetary Phenomenon?", *Journal of Money, Credit and Banking*, vol. 37, issue 5, pp. 887-906

Smyth, R & Narayan, P (2004) "Hail to the Chief! Leadership and Structural Change in the Level of Consensus on the High Court of Australia", *Journal of Empirical Legal Studies,* vol. 1, no. 2, pp. 399–427

Smyth, R & Narayan, P (2006) "Multiple Regime Shifts in Concurring and Dissenting Opinions on the U.S. Supreme Court", *Journal of Empirical Legal Studies*, vol.3, no.1, pp. 79–98

Tan G (2003), *ASEAN: Economic Development and Cooperation*, 3rd Edition, Eastern Universities Press, Singapore

Thambipillai, P & Saravanmuttu, J (1985) *ASEAN Negotiations: Two Insights*, Institute of Southeast Asian Studies, Singapore

Timmermann, A (2001) "Structural Breaks, Incomplete Information, and Stock Prices", *Journal of Business & Economic Statistics*, vol. 19, no. 3 (Jul.), pp. 299-314

Zivot, E & Andrews, D (1992) "Further Evidence on the Great Crash, the Oil-Price Shock, and the Unit-Root Hypothesis" *Journal of Business & Economic Statistics*, vol. 10, no. 3 (Jul), pp. 251-270

Figure 1: The Organisational Structure of ASEAN

Note: AEM: ASEAN Economic Ministers; AMM: ASEAN Ministerial Meeting; AFMM: ASEAN Finance Ministers Meeting; SEOM: Senior Economic Officials Meeting; ASC: ASEAN Standing Committee; SOM: Senior Officials Meeting; ASFOM: ASEAN Senior Finance Officials Meeting.
Source: ASEAN Secretariat, http://www.aseansec.org/13103.htm

Figure 2: ASEAN FTSE Index - 1994 to 2007

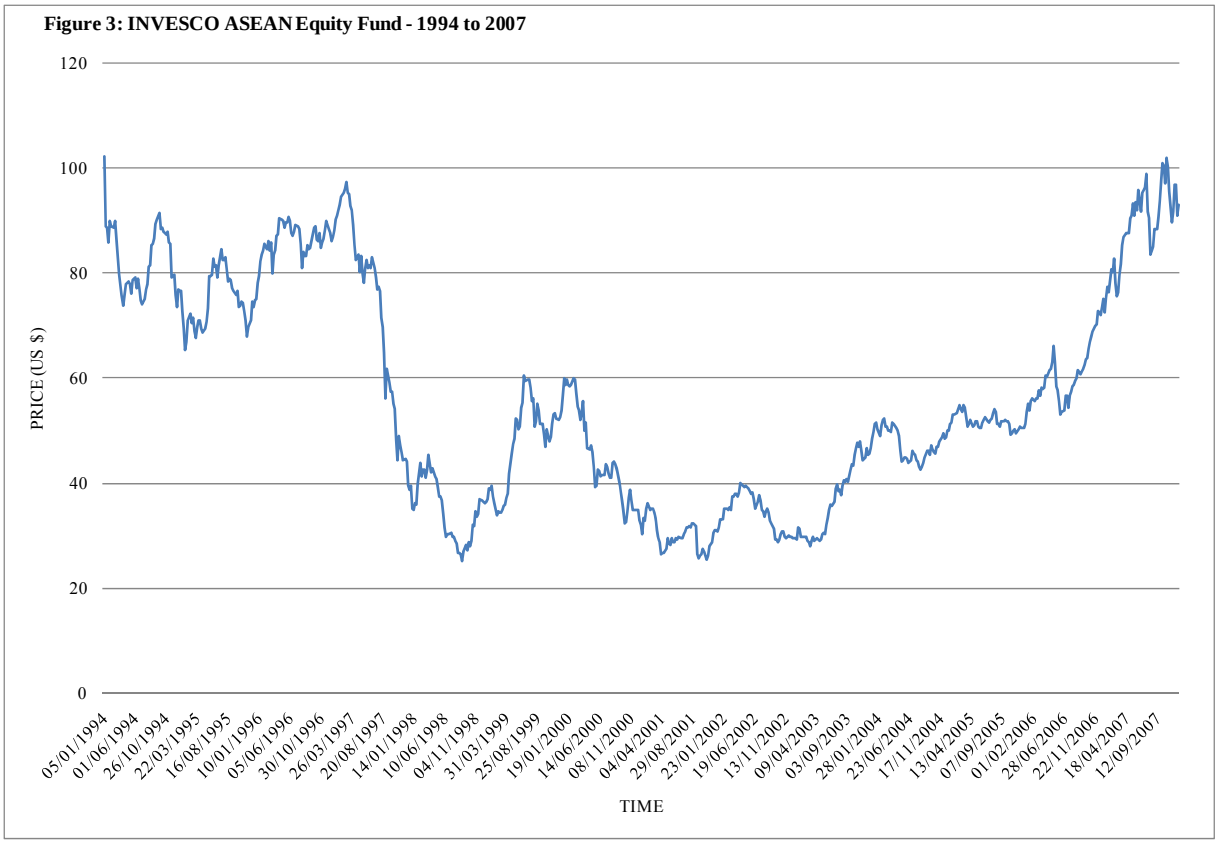
Figure 3: INVESCO ASEAN Equity Fund - 1994 to 2007
120
100
80
60
40
20
0
PRICE (US $)
05/01/1994
01/06/1994
26/10/1994
22/03/1995
16/08/1995
10/01/1996
05/06/1996
30/10/1996
26/03/1997
20/08/1997
14/01/1998
10/06/1998
04/11/1998
31/03/1999
25/08/1999
19/01/2000
14/06/2000
08/11/2000
04/04/2001
29/08/2001
23/01/2002
19/06/2002
13/11/2002
09/04/2003
03/09/2003
28/01/2004
23/06/2004
17/11/2004
13/04/2005
07/09/2005
01/02/2006
28/06/2006
22/11/2006
18/04/2007
12/09/2007
TIME

Table 1: ASEAN Finance Ministers Meetings: 1997 - 2008

Regime	Chair/Leader	Period of Regime
1st AFMM-Special AFMM Chairmanship	Thailand	01-Mar-1997 - 27-Feb-1998
2nd AFMM Chairmanship	Indonesia	28-Feb-1998 - 19-Mar-1999
3rd AFMM-Special AFMM Chairmanship	Vietnam/Philippines	20-Mar-1999 - 24-Mar-2000
4th AFMM-Special AFMM Chairmanship	Brunei Darussalam	25-Mar-2000 - 06-Apr-2001
5th AFMM Chairmanship	Malaysia	07-Apr-2001 - 04-Apr-2002
6th AFMM Chairmanship	Myanmar	05-Apr-2002 - 05-Aug-2003
7th AFMM Chairmanship	Philippines	06-Aug-2003 - 06-Apr-2004
8th AFMM Chairmanship	Singapore	07-Apr-2004 - 05-Apr-2005
9th AFMM Chairmanship	Lao PDR	06-Apr-2005 - 04-Apr-2006
10th AFMM Chairmanship	Cambodia	05-Apr-2006 - 04-Apr-2007
11th AFMM Chairmanship	Thailand	05-Apr-2007 - 03-Apr-2008

Table 2: Unit Root Test Results for Benchmark Index and Equity Fund

Series	Sample Period	Sample Size	ADF		PP		KPSS	
			S t-statistic [lag length/ band width]	*D(S)* t-statistic [lag length/ band width]	*S* t-statistic [lag length/ band width]	*D(S)* t-statistic [lag length/ band width]	*S* t-statistic [lag length/ band width]	*D(S)* t-statistic [lag length/ band width]
FTSE/ASEAN	1994 - 2007	730	-0.784973 [3]	-13.10174** [2]	-1.039448 [13]	-25.60919** [13]	0.615146** [22]	0.049033 [13]
INVESCO	1994 -2007	730	-0.873973 [1]	-24.13135** [0]	-1.275139 [12]	-24.57361** [12]	0.619051** [22]	0.039806 [12]

Note: ALL - unit-root tests were undertaken on EVIEWS 6.0 and are inclusive of trend and intercept; *S* denotes the level of the series and *D(S)* denotes the first difference of the series; * indicates statistical significance at 5% level and ** indicates statistical significance at 1% level; ADF – null hypothesis of series has a unit root and alternate hypothesis of series is stationary; lag length is automatically selected via Schwartz Information Criterion with a maximum lag length of 19; critical values at the 1%, 5%, 10% levels are -3.970, -3.416, -3.130 respectively; PP – null hypothesis of series has a unit root and alternate hypothesis of series is stationary; bandwidth determined by Newey-West using the Bartlett kernel; critical values at the 1%, 5%, 10% levels are -3.970, -3.416, -3.130 respectively; KPSS – null hypothesis of series is stationary and alternate hypothesis of series has a unit root; bandwidth determined by Newey-West using the Bartlett kernel; critical values at the 1%, 5%, 10% levels are 0.216, 0.146, 0.119 respectively.

Table 3: Carrion-i-Silvestre et al (2005) KPSS Univariate Test Results for Benchmark Index and Equity Fund

Series	Sample Period	Sample Size	t- Statistic	Critical Values		
				1%	*5%*	*10%*
FTSE/ASEAN	1994 - 2007	730	-0.76553728	0.606000	0.383000	0.286000
INVESCO	1994 -2007	730	-0.88415286	0.616000	0.378000	0.284000

Series	Estimated Break Points							
	m1	*m2*	*m3*	*m4*	*m5*	*m6*	*m7*	*m8*
FTSE/ASEAN	24-May-1995	15-Oct-1997	14-Apr-1999	13-Sep-2000	20-Mar-2002	13-Aug-2003	05-Jan-2005	02-Aug-2006
INVESCO	11-Jan-1995	09-Oct-1996	15-Apr-1998	15-Sep-1999	07-Feb-2001	07-Aug-2002	31-Dec-2003	03-Aug-2005

Note: Null hypothesis of series is breakpoint stationary and alternate hypothesis of series has a unit root; The number of breakpoints have been estimated using the modified Schwartz Information Criteria (LWZ) i.e. model 2; the maximum number of breaks = 8; trimming specified at 10 % or [0.10T, 0.90T]; sample critical values are computed by means of Monte Carlo simulations using 20,000 replications.

Table 4: Results of Bai and Perron (1998) Tests for Multiple Regime Shifts

		Specifications			
		Zt(1)	*q = 1*	*p =0*	*h = 73*	*Mmax = 8*
Tests	FTSE/ASEAN Statistics	INVESCO Statistics	Critical Values		
			1%	*5%*	*10%*
SupFt(1)	0.1757	0.4055	13.00	9.10	7.42
SupFt(2)	11.4120***	8.4735**	10.14	7.92	6.93
SupFt(3)	12.7757***	14.9515***	8.42	6.84	6.09
SupFt(4)	8.5230***	29.2504***	7.31	6.03	5.44
SupFt(5)	9.1498***	19.7659***	6.48	5.37	4.85
SupFt(6)	10.5660***	19.3267***	5.74	4.80	4.32
SupFt(7)	63.1516***	42.6657***	5.05	4.23	3.83
SupFt(8)	61.3630***	41.9123***	4.28	3.58	3.22
UDmax	63.1516***	42.6657***	13.07	9.52	8.05
Wdmax at 1% level	186.383***	127.3037***	14.53	n.a.	n.a.
Wdmax at 5% level	155.9786**	106.5369**	n.a.	10.39	n.a.
Wdmax at 10% level	141.4018*	96.5805*	n.a.	n.a.	8.63

Note: h = minimal length of segment; Mmax = maximum number of breaks permitted; p = number of regressors whose coefficients are fixed across regimes; and q = number of regressors whose coefficients are allowed to change. The SupFt(L) F-Statistic considers a null hypothesis of no structural breaks (m = 0) against the alternative hypothesis that there are m = k breaks. The UDmax statistic is the maximum value of the SupFt(L) F-Statistic where L represents the upper bound.. The WDmax statistic weights the individual statistics so as to equalise the p-values of m. The relevant critical values are provided in Bai and Perron (1998). * (**) *** indicates statistical significance at 10%, 5% and 1% levels respectively.

Table 5: Estimates with Breaks: Results of Bai and Perron (1998) Tests

FTSE/ASEAN									
Number of breaks selected by the LWZ method: 6									
Delta	Estimate (t-value)		Break Points		Break Dates		95% Confidence Interval for Break Dates		
δ1	6.101911	(662.552293)	*m1*	198	*T1*	15-Oct-1997	17-Sep-1997	-	05-May-1999
δ2	5.006712	(341.209864)	*m2*	276	*T2*	14-Apr-1999	10-Mar-1999	-	21-Mar-2001
δ3	5.409998	(361.534214)	*m3*	351	*T3*	20-Sep-2000	21-Apr-1999	-	29-Nov-2000
δ4	5.082177	(481.903353)	*m4*	502	*T4*	13-Aug-2003	08-Jan-2003	-	15-Jun-2003
δ5	5.366480	(353.812045)	*m5*	575	*T5*	05-Jan-2005	05-Feb-2003	-	01-Mar-2006
δ6	5.578612	(389.811607)	*m6*	657	*T6*	02-Aug-2006	02-Feb-2005	-	10-Jan-2007
δ7	5.977919	(394.124239)	*m7*	n.a.	*T7*	n.a.	n.a.	-	n.a.
δ8	n.a.	n.a.	*m8*	n.a.	*T8*	n.a.	n.a.	-	n.a.
δ9	n.a.	n.a.							

INVESCO									
Number of breaks selected by the LWZ method: 6									
Delta	Estimate (t-value)		Break Points		Break Dates		95% Confidence Interval for Break Dates		
δ1	4.388445	(521.722734)	*m1*	198	*T1*	15-Oct-1997	06-Aug-1997	-	23-Sep-1998
δ2	3.584660	(267.480301)	*m2*	276	*T2*	14-Apr-1999	06-Nov-1996	-	14-Jun-2000
δ3	3.917006	(284.686291)	*m3*	350	*T3*	13-Sep-2000	01-Mar-2000	-	16-Jan-2002
δ4	3.468126	(354.052580)	*m4*	496	*T4*	02-Jul-2003	23-Apr-2003	-	23-Jun-2004
δ5	3.828028	(281.954053)	*m5*	572	*T5*	15-Dec-2004	01-Oct-2003	-	08-Mar-2006
δ6	3.984594	(310.377380)	*m6*	657	*T6*	02-Aug-2006	26-Oct-2005	-	20-Sep-2006
δ7	4.396108	(317.341070)	*m7*	n.a.	*T7*	n.a.	n.a.	-	n.a.
δ8	n.a.	n.a.	*m8*	n.a.	*T8*	n.a.	n.a.	-	n.a.
δ9	n.a.	n.a.							