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The Real Effective Exchange Rate Impact on ASEAN-5 Economic Growth

Abdalrahman AbuDalu[1]*, Elsadig Musa Ahmed[2], Suleiman Warred Almasaied[3] and Abuelgasim Ismail Elgazoli[4]

[1]Ommudorman Islamic University, Jordan
[2]Economics Unit, Faculty of Business, Multimedia University, Malaysia
[3]Department of Planning and Economy, Abu Dhabi, UAE
[4]Faculty of Economic and Management University Putra Malaysia- UPM

Abstract

This is an empirical analysis study focuses simultaneously on the impact of the real effective exchange rate, domestic interest rate, foreign interest rate, inflation rate, domestic money supply, net foreign assets and terms of trade which were identified by earlier researchers upon real growth domestic products (RGDP) of the ASEAN-5 countries. The real effective exchange rates (REER) of these currencies are measured against the US Dollar based on authoritative quarterly data time series between 1991:Q1 to 2006:Q2. This study is expected to provide several important economic and financial contributions to fill the gap in the financial and economic literature for ASEAN countries. It identifies the measure of the impact of the real effective exchange rates (REER) upon their economic growth using the most advanced statistical frameworks. A recently developed "Autoregressive Distributed Lag (ARDL)" co-integration by Pesaran et al. was the fundamental approach employed to analyse the relevant hypotheses of this study. The ARDL technique indeed was recognized to have additional advantages of yielding consistent estimates of the long-run coefficient. The empirical results confirm that the domestic money supply (M1) followed by REER (S) are the long-term and short- run variables that had positive and significant impact on ASEAN-5 countries' real domestic products' growth rate (RGDP). The other identified variables by the earlier researchers had diverse impacts during the full study period, their impact on economic growth of the study countries over the period vary in accordance to the contemporary businesses and economics environments.

Keywords: RGDP; REER; ASEAN-5 (Malaysia, Indonesia, Philippines, Thailand, and Singapore); AFC and ARDL

Introduction

The 1997 Asian Financial crisis (AFC) plunged some of the most successful emerging economies in the world, particularly Thailand, Malaysia, Indonesia, Philippines and Singapore, into acute financial chaos. The AFC caused a temporary collapse in these economies. The economic impact of the AFC was very severe. It was not only severe on the financial sectors but also on the real sectors in these countries. Thus, the 1997 AFC has been recorded as a critical turning point in ASEAN-5[1] economic history and financial development. The cases of Malaysia and Singapore merit special attention because they appear to be the most flexible currencies among the ASEAN-5 currencies, particularly against the currencies that have smaller weights in the basket of currencies. The ASEAN-5 currencies were severely affected by the Asian financial crisis; the ASEAN-5 was undervalued and as such suffered a modest decline in value during the recent currency crisis [1,2]. Most of the ASEAN-5 currencies such as Malaysia and Singapore have now returned to an orderly behaviour nine years after the landmark event. It is worth mentioning that the ASEAN-5 have also growth experiences that are sufficiently different from each other in terms of timing, resource dependence and industrial structure although they may have shared the common "growth miracle" [2,3]. In addition, it was empirically and theoretically[2] argued that the AFC caused the ASEAN-5 economies to become more sensitive to change and fluctuations in the world economy – particularly the economy of the USA. Therefore, the issue of the degree of sensitivity of the

ASEAN-5 economies to the USA would be measured in this study.[3] The findings of this study should be useful for the ASEAN-5 policymakers.[4] In the light of the serious implication of the changes and fluctuations of exchange rates in ASEAN-5 economics, it is critically important to conduct a study on the ASEAN-5 REER determinants that it has many important impacts on their economic growth.

This study attempts to employ the co-integration statistical techniques developed by Pesaran [6], known as Autoregressive Distributed Lag (ARDL), which has been known to offer a more robust alternative to measure the impact of the exchange rate upon their economic growth. The study covered the period 1991:Q1 – 2006:Q2 for the ASEAN-5 economies, namely Malaysia, Indonesia, Philippines, Thailand and Singapore. The main reasons for choosing these countries are that they are the founding members of ASEAN since 1967 and they had been affected by the AFC.

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[3]This currency dominates as the world major currencies and the value of ASEAN-5 currencies were largely and directly linked with the value of the U.S. Dollar.

[4]For the policymakers, it is essential to understand the relationship between trade sectors and the exchange rate i.e., the magnitude of the impact of the exchange rate on the domestic prices as well as the speed of import and export prices changing to affect domestic prices.

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*Corresponding author: Abdalrahman AbuDalu, Ommudorman Islamic University, Jordan, Tel: +60126330517; E-mail: abdawad77@yahool.com

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[1]ASEAN-5 or the Association of Southeast Asian Nations was established on 8 August 1967 in Bangkok by the five original Member Countries, namely, Indonesia, Malaysia, Philippines, Singapore, and Thailand. Brunei Darussalam joined on 8 January 1984, Vietnam on 28 July 1995, Lao PDR and Myanmar on 23 July 1997, and Cambodia on 30 April 1999.

[2]Baharumshah and Ariff [4], Azali et al. [5].

Review of Literature

The literature review attempts to search for the economic and financial impacts of the earlier identified variables. These variables are the real effective exchange rate, the domestic interest rate, foreign interest rate, inflation rate, domestic money supply, net foreign assets and terms of trade on economic growth of the ASEAN-5 countries. An intensive search and an extensive survey focused on both the theoretical arguments as well as the post-empirical evidence by the earlier researchers related to the research issues. In brief, this chapter essentially attempts to highlight some major issues raised by the earlier researchers through their theoretical and empirical frameworks on the determinants of exchange rates and economic growth.

Cheng and Siyan [7] and Julian and Jay [8] used a simple framework to analyze the impact of exchange rate regimes on economic growth assuming a baseline growth equation (1) for country i at time t as follows:

$$y_{it} = \alpha + \beta X_i + \delta d_i + \varepsilon_i \qquad (1)$$

where y denotes the growth rate, X are determinants of growth such as those specified by Barro [9], d is the dummy for the exchange rate regime with one for pegged exchange rate regime and zero for flexible exchange rate regime, and ε denotes the zero mean error term that were assumed independent of X and d. Whether the exchange rate regime affects a country's growth is conditional on X depending on the regression estimate of δ being significantly different from zero or not. The relationship between the exchange rate and economic growth is certainly an important subject, both from the positive (descriptive) and normative (policy prescription) perspectives. Several developing countries that have implicitly or explicitly fixed their exchange rates to the currency of another country (the US Dollar and others) with their inflation rates being higher than that of the foreign country (the US), often experience persistent current account deficits and an eventual devaluation of their currency. The devaluation often invites a recession and inflation, thus pushing the economy into an inflation-devaluation spiral and causing a serious setback in economic.

The exchange rate is thought to influence economic growth through the effect of exchange rate volatility on the profitability of international trade and investment. The Balassa-Samuelson effect posits that a country which has relatively high productivity in its traded goods sector, compared to its non-traded goods sector, will have an overvalued currency relative to its trading partners. Furthermore, if the productivity growth in the home country's tradable sector is more favorable relative to its trading partners over time, a secular appreciation into its real effective exchange rate (REER) will be imparted [10]. The impact of exchange rate on economic growth has been the subject of surprisingly little work, probably due to the fact that this variable was considered to be unrelated to longer-term economic growth performance as mentioned in the works of De Gregorio [11], and Roubini and Salai [12]. In addition, "there have been so few applied theoretical analyses of exchange rates and economic growth because there was a genuine scarcity of satisfying models in which money played an explicit role [13]".

However, flexible exchange rate regime could amplify the negative effects of terms of trade shocks for countries where the private and public sectors have large foreign currency-dominated liabilities. Currency depreciation generated by the external shock could generate large increases in the value of the debt expressed in domestic currency. This might trigger bankruptcies, and result in a reduction in the rate of

growth. Among the few researchers, Ito et al. [14] tested the Balassa-Samuelson hypothesis - rapid economic growth is accompanied by real exchange rate appreciation because of differential productivity growth between tradable and non-tradable sectors, for APEC[5] countries. They proceeded to examine the Balassa-Samuelson effect that is, the correlation between the percentage changes in national price levels and growth rates of GDP per capita. In contrast with the high cross-section correlation between the levels, they did not find any correlation between the average annual changes in the cross-section, which suggested that per capita output growth by itself provided a poor explanation of long-run ends in real exchange rates.

Malcolm and Tzvetana [15] estimated the relation between exchange rates and economic growth (GDP growth) in Kenya. The results showed that there was no statistically significant direct relationship between the two variables from the changes in the exchange rate and GDP growth. Joe [16] investigated the effect of exchange rate uncertainty (ERU) on long-term economic growth of 21 OECD countries. Eduardo and Federico [17] examined the relationship between exchange rate regimes and economic growth for a sample of 183 countries over the post-Bretton Woods period (1974-2000). They used a new de facto classification of regimes based on the actual behavior of the relevant macroeconomic variables. In contrast with previous studies, they found that, for developing countries, less flexible exchange rate regimes were strongly associated with slower growth, as well as with greater output volatility. For industrial countries, on the contrary, exchange rate regimes did not appear to have any significant impact on growth.

Dimitris and Christopoulos [18] examined the currency devaluation–output growth relationship for eleven Asian[6] countries. The results suggested that, in the long run, five out of eleven countries will experience the negative impact of depreciation on output growth while for three countries–Indonesia, Myanmar and the Philippines– depreciation will improve growth prospects. Rajen [19] explored the nature of the relationship between India's real exchange rates, export volume and world and OECD GDP growth. This study used data on four variables - export volume for India (EV), the real effective exchange rate for India (REX) and two measures of global growth, which were world (WGDP) and OECD GDP (OGDP). The results suggested that, strategically, India would benefit from a policy of managed export growth rather than an export growth that was stimulated by real exchange rate depreciation, as this might have negative effects on the Indian economy.

David and Guillermo [20] examined the effect of currency crisis on economic growth for 28 countries. The results indicated that the real exchange rate was highly correlated with the intensity of economic growth which dropped during periods with currency crisis; also, they found that there was a direct relation between the GDP and RER. Justin et al. [21] investigated the relationship between exchange rate regimes and GDP growth for 180 countries. The results found that the growth was higher under stable currency-value regimes. Significant asymmetric effects on country growth were found for non-industrialized countries. Countries that exhibited fear of floating, experience significantly higher growth. Julian and Jay [8] attempted to explore the connection between interest rates in major industrial countries and annual real output growth in other countries by using sample period from 1973 to 2002.

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[5]APEC economies, also the countries in Asia namely Japan, Korea, Taiwan, Hong Kong, Singapore, Thailand, Indonesia and Malaysia.

[6]India, Indonesia, South Korea, Malaysia, Myanmar, Nepal, Pakistan, Philippines, Singapore, Sri Lanka and Thailand.

The results showed that high foreign interest rates have a contractionary effect on annual real GDP growth in the domestic economy, but that effect is centered on countries with fixed exchange rates. The results suggest that also being forced to follow the base country's monetary policy even when it is not optimal for the domestic economy may cause increased volatility in GDP for fixed exchange rate countries.

Methodology of the Study

Source of data

Our estimates on this study were based on the most up to date quarter data for the sample period 1991:1q - 2006:2q for Malaysia, Indonesia, The Philippines, Thailand and Singapore. The published quantitative financial and economic data were extracted from three main sources: the International Monetary Fund (IMF, various issues and home page), central banks of ASEAN-5 countries, various issues of reports published. The data acquired from the above sources compared with the data extracted from DataStream (UUM online library software).

Model specification

In this paper, the RGDP model applied to explore the significant factors that impact on RGDP of the ASEAN-5 countries. However, Frankel [22], Edison [23], Dibooglu and Enders [24], Baharumshah and Ariff [4], Mehdi and Taylor [25], Goh Soo and Mithan [26], Azali et al. [5], Taylor [27], Sarno and Taylor [28], Baharumshah and Lim [29], Chaboud and Wright [30], and Naseem et al. [31] found that many empirical and earlier researchers on exchange rate and growth model adopted co-integration techniques.

Economic growth model: This model is also specified in line with earlier models to investigate the impact of exchange rates, domestic interest rate, foreign interest rate, inflation rate, domestic money supply, net foreign assets, and terms of trade (TOT) upon real gross domestic product (RGDP) on the ASEAN-5 economic growth.

Economic growth in developing countries (besides other factors) can be explained by the "catch-up" process in the level of technology. Technological diffusion plays a central role in the process of economic development. Backward economic growth depends on the adoption and implementation of new technologies that are already being used in developed countries. Most of the important macroeconomic effects indirectly determine the impact of exchange rates on the rate of economic growth. Earlier studies by Malcolm and Tzvetana [15], McPherson [32], Sachs et al. [33], MacDonald [10], Cheng and Siyan [7] and Julian and Jay [8] found that exchange rates, domestic interest rate, foreign interest rate, inflation rate, domestic money supply, net foreign assets, TOT were found in the previous theories and empirical works as important factors that had a significant impact on economic growth in developing countries. Therefore, this study attempts to examine the impact of those mentioned economic and financial variables on REER and economic growth in ASEAN countries.

According to Cheng and Siyan [7] and Julian and Jay [8], the impact of the exchange rates on the growth rate of ASEAN-5 economies may be empirically assessed by reformulating Equation (2) as:

$$Gt \, G_t = f(S, R, R^*, M, \pi, NFA, TOT)$$

Where

RGDP= Growth rate of real gross domestic product[7]

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[7]A majority of empirical literature uses per capita growth rate of real GDP as a

S_t= real effective exchange rate in ASEAN-5 countries via USD.

R = domestic interest rate in ASEAN-5 countries.

R*= foreign interest rate.

M= money supply in ASEAN-5 countries.

π = inflation rate.

NFA = Net foreign asset.

TOT = terms of trade.

The equation may be re-written to a linear testable equation as follows:

$$RGDP_t = \beta_0 + \beta_1 S + \beta_2 R + \beta_3 R^* + \beta_4 M + \beta_5 \pi + \beta_6 NFA + \beta_7 tot + \varepsilon_t \quad (2)$$

Econometric method

Unit root test: test for stationary: The recent economic developments in econometrics warrant to examining the characteristics of time series. The researchers [34] stated that the application of standard methods of conventional non-stationarity data, contain any Unit Root problem, may lead to spurious correlation in the regression analysis. The stationary test commonly known as the unit root test is conducted to check the order of the integration of each of the variable that is the number of times they must be differenced before attaining stationary. In order to avoid the problem of spurious correlation in the regression analysis, the time series properties of the variables will use in the regression analysis of this study are investigated using the two most popular unit root tests proposed to examine the stationary, which are the Augmented Dickey-Fuller (ADF) and the Phillips Perron tests.

Autoregressive Distributed Lag (ARDL)

Pesaran et al. [4,35-37] developed a procedure, called Autoregressive Distributed Lag (ARDL). The ARDL approach also allows us to identify long-run and short-run dynamics explanatory variables on a dependent variable. It can be applied regardless of the stationary properties of the variables in the sample and it allows for inferences on long-run estimates, which is not possible under alternative co-integration procedures. The first step in the ARDL procedure outlined by Pesaran and Shin [37] is to test the long-run significance of the dependent variables, by computing the F-statistic test the significance of the lagged levels of the variables in the error correction form of the underlying ARDL model. This is similar to testing the significance of the error correction term in an error correction model. It involves the testing of the joint long-run significance of all explanatory variables including the constant.

We apply the ARDL approach proposed by Pesaran et al. [6] to estimate Equation (2); this study rewrote the ARDL model for Equation (3) as follows:

$$\Delta RGDP_t = \alpha_0 + \sum_{i=1}^{n} \alpha_{1i} \Delta RGDP_{t-1} + \sum_{i=0}^{n} \alpha_{2i} \Delta S_{t-1} + \sum_{i=0}^{n} \alpha_{3i} \Delta R_{t-1} + \sum_{i=0}^{n} \alpha_{4i} \Delta R^*_{t-1} + \sum_{i=0}^{n} \alpha_{5i} \Delta M_{t-1}$$

$$+ \sum_{i=0}^{n} \alpha_{6i} \Delta \pi_{t-1} + \sum_{i=0}^{n} \alpha_{7i} \Delta NFA_{t-1} + \sum_{i=0}^{n} \alpha_{8i} \Delta TOT_{t-1} + \beta_1 S_{t-1} + \beta_2 R_{t-1} + \beta_3 R^*_{t-1}$$

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dependent variable. This makes sense in terms of theoretical models such as neoclassical or endogenous growth models, where the focus is on a steady state. However, if macroeconomic policies affect the long-run economic growth, the growth rate of real GDP may be a better variable, since policy-makers respond to changes in real GDP or the growth rate of real GDP rather than per capita growth rates. Therefore, this study used the growth rate of real GDP as our dependent variable.

$$+ \beta_4 M_{t-1} + \beta_5 \pi_{t-1} + \beta_6 NFA_{t-1} + \beta_7 TOT_{t-1} + \varepsilon_t$$

(3)

where RGDP is the growth rate of real gross domestic product in ASEAN-5, S is denot to real effective exchange rate (REER), R and R* are the domestic interest rate and the foreign interest rate, respectively. M1 refers to the money supply, π refers to the inflation rate, NFA refers to net foreign assets and TOT refers to the terms of trade. The symbol "Δ" refers to the first difference, n is the lag number in the independent variables $\sum_{i=1}^{n}$ and ε refers to the error term. The main advantages of this procedure are: Firstly, there is no prior endo-exogenous division of variables; secondly, no zero restrictions are imposed, and finally, there is no strict economic theory within which the model is grounded. The ARDL approach also allows us to identify long-run and short-run dynamics explanatory variables on a dependent variable.

Empirical Results

It must be noted that this empirical study employed Autoregressive Distributed Lag (ARDL) bound test model to measures the impact significant long- and short-term misalignment variables of RGDP of the above-mentioned selected ASEAN-5 countries. Since the ARDL empirical results have been repeatedly proven by many of the earlier researchers to be more parsimonious, more robust and easier than other statistical approaches, moreover it can be easily interpreted and translated into layman words, this chapter concentrates its discussion on the ARDL results.

Unit root test

In this study, we utilized the two most popular unit root tests details given in Table 1, the Augmented Dickey Fuller (ADF) and Phillips-Perron (PP) tests, to check if the variables under consideration were integrated of I (0), I (1) or mutually integrated. It is widely known that if any variable in the model integrated of an order higher than I (1), the ARDL technique could not used to provide reliable estimates of the parameters of the model. ADF and PP tests suggest that most of our variables for ASEAN-5 economies are integrated in order I(0) or I(1) which means that the null hypothesis of unit root rejected for all series in both ADF and PP tests. Thus, we relied on the ARDL approach to estimate and interpret the parameters of the models used in the present study.

Optimal lag length

The test was conducted by estimating the unrestricted VAR model. The optimal order of the VAR model was determined based on the Akaike [38] Information Criteria (AIC), Schwarz [39] Bayesian Criteria (SBC). The results based on the 2 selection criteria are given in Table 2. Based on AIC, SBC criteria the optimal a lag for the Philippines and Singapore are one, while Malaysia, Indonesia and Thailand showed lag length of two in AIC and one in SB,. His study relies on the Schwarz Bayesian Criteria (SBC) for each of the ASEAN-5 exchange rate models, because it provides us with the most parsimonious model, consistent results and it is adequate for a small-sample [40].

Bound test

To determine the existence of long run relationship or cointegration among the variable in Model 3.2, this study employed a bound test proposed by Pesaran et al. [6,35]. This was done to test the

null hypothesis of no cointegration against the alternative hypothesis. F-statistics was computed to estimate the significance of the lagged level of the variables in Equation (3). If the computed F-statistics falls above the upper bound criteria value, which is provided by Pesaran et al. [6,36], then the null hypothesis of no cointegration is rejected. If it falls below the lower bound, then the null hypothesis of no cointegration cannot be rejected. Finally, if it falls within the critical value bound, the result would be inconclusive. Once cointegration is confirmed, this study moves to the second stage and estimate the log-run coefficients of growth model and the associated ARDL error correction model.

The bound tests for each of the ASEAN-5 countries are presented in Table 3 Using the asymptotic criteria value bounds computed by Pesaran et al. [4], all the test statistics in lag two were significant at different levels. $F_{\Delta RGDP}$ Statistics test results for Malaysia, Indonesia, Philippines, Thailand and Singapore were 5.70, 6.49, 4.48, 4.52 and 5.93 respectively, and all fell above the upper 1% critical value bound (2.88-3.99). Again, this implies rejecting the null hypothesis at 1% level, regardless of the underlying order of integration. Meanwhile, in the case of the Philippines, the $F_{\Delta RGDP}$ result was 3.3780, which rejected the null hypothesis at the 5% significance level. Results reported in Table 3 also show that the null hypotheses that the level variables do not enter significantly in the equation for ΔS, ΔR, ΔR*, ΔM, Δπ, NFA and TOT cannot be rejected at 10% significance level or more. Only in the ΔRGDP equations are the null hypotheses rejected, indicating that there exists a unique long-run relationship among the specified variables.

ARDL long-run relationships

It is an axiomatic task to test the impact of the long-run variables of exchange rates, domestic interest rate, foreign interest rate, inflation rate, domestic money supply, net foreign assets and terms of trade upon real gross domestic product (RGDP) in the ASEAN-5 economic growth. It must be noted that one can easily observe from all the statistical results in Table 4 that all of the selected variables' parameters were statistically significant at least at a 10% significance level (or 90% confidence level). The explanatory statistical results of the $\overline{R}^2$ of all the RGDP equations, which measure the goodness of fit of those models have consistently provided acceptable coefficient determination levels. In addition, DW tests showed that all the data employed for all ASEAN-5 RGDP's equations were normally distributed. The robustness of these statistical results were further enhanced by their low level of standard error of regression and the small sum of squared error regression further suggested that those models were well-specified. Therefore, the explanatory long-run determinants of ASEAN-5 RGDPs were carefully modelled and thus can be confidently interpreted.

Malaysia: The results from the mentioned Table 4 showed that the domestic money supply (M1) and REER (S) had the highest significant impacts on Malaysia's economic growth throughout the whole period of this study. Moreover, domestic interest rate and foreign interest rate (R*) also played a vital role in Malaysia's economic growth, which is the second direct important source of economic growth. This shows that Malaysia's economic and monetary policies were prudently executed by the Central Bank of Malaysia (CBM) under the keen scrutiny of the Malaysian Treasury and the Ministry of Finance. The CBM essentially continues to exercise its pragmatic and prudent monetary policy where the amount of money in circulation (M1) is continuously monitored, supervised and controlled. This becomes more effective when the government always exercises a balanced budget practice even during and after the AFC. This exercise leads M1 to serve as one of the significant long-term impact variable.

Variable	Level				First Difference			
	ADF		PP		ADF		PP	
	Int	Tre+ Int	Int	Tre+ Int	Int	Tre+ Int	Int	Tre+ Int
Malaysia								
RGDP	0.723	-1.200	1.258	-2.523	-4.1429^b	-4.252^b	-11.56^a	11.86^a
R	-1.688	-2.775	-1.373	-2.472	-4.768^a	-4.722^b	-4.708^a	-4.66^a
M1	1.062	-1.268	1.674	-1.137	-8.186^a	-8.381^a	-8.196^a	-8.384^a
NFA	0.351	-1.743	0.622	-1.516	-5.167^a	-5.303^a	-5.194^a	-5.303^a
TOT	-2.066	-2.667	-1.981	-2.710	-10.40^a	-10.41^a	-10.14^a	-10.15^a
Π	-2.755^c	-2.904	-1.547	-1.420	-4.807^a	-4.851^a	-4.448^a	-4.470^a
Indonesia								
RGDP	0.453	-4.856^b	-0.009	-2.916	-5.109^a	-5.129^a	-8.138^a	-8.104^a
R	-3.207^b	-3.345^c	-2.176	-2.319	-4.305^b	-4.271^b	-4.049^b	-4.011^b
M1	4.717^a	-0.741	5.993^a	5.993^a	-0.698	-2.356	-8.340^a	-25.62^a
NFA	0.092	-3.100	0.624	-3.031	-9.284^a	-9.419^a	-9.324^a	-9.419^a
TOT	-3.013^b	-3.672^b	-2.883^c	-3.662^a	-7.466^a	-7.437^a	-11.34^a	-11.77^a
Π	-2.929^b	-2.905	-2.831^c	-2.814	-6.759^a	-6.698^a	-4.141^b	-4.073^b
Philippines								
RGDP	2.147	-1.341	-1.451	-8.187^a	-2.974^b	-4.798^b	-33.00^a	36.28^a
R	-3.775^b	-4.305^b	-3.881^b	-4.302^b	-7.272^a	-7.298^a	-7.961^a	8.124^a
M1	3.815^a	-0.771	5.423^a	-0.220	-3.140^b	-7.988^a	-9.418^a	-21.83^a
NFA	3.807^a	1.123	4.653^a	1.562	-5.913^a	-7.054^a	-5.937^a	-7.058^a
TOT	-1.129	-1.683	-2.354	-3.715^b	-9.428^a	-9.344^a	-13.53^a	-13.403^a
Π	-2.424	-2.692	-2.897^c	-3.093	-4.578^a	-4.556^b	-6.937^a	-6.928^a
Thailand								
RGDP	-2.470	-2.355	-2.296	-2.201	-7.624 ^{a}	-7.730 ^{a}	-7.624 ^{a}	-7.730 ^{a}
R	-1.831	-2.098	-1.965	-1.867	-5.331 ^{a}	-5.386 ^{a}	-5.294 ^{a}	-5.358 ^{a}
M1	0.427	-1.812	0.870	-2.555	-2.055	-2.248	-10.44 ^{a}	-11.720 ^{a}
NFA	0.578	-1.598	1.343	-1.059	-4.239 ^{b}	-4.622 ^{b}	-4.313 ^{a}	-4.522 ^{b}
TOT	-2.111	-1.869	-2.087	-1.840	-7.401 ^{a}	-7.471 ^{a}	-7.403 ^{a}	-7.473 ^{a}
Π	-2.164	-2.438	-2.220	-2.204	-5.244 ^{a}	-5.196 ^{a}	-5.295 ^{a}	-5.251 ^{a}
Singapore								
RGDP	0.063	-2.487	0.757	-2.401	-9.135^a	-7.484^a	-9.531^a	-10.13^a
R	-2.093	-3.152	-1.631	-2.276	-5.013^a	-5.169^a	-4.620^a	-4.584^b
M1	0.567	-1.636	0.902	-1.541	-7.503^a	-6.927^a	-7.573^a	-7.619^a
NFA	2.126	0.144	2.147	0.097	-7.990^a	-8.532^a	-8.122^a	-8.530^a
TOT	-1.519	-4.489^B	-1.335	-4.594^b	-10.28^a	-10.19^a	-10.37^a	-10.27^a
Π	-1.435	-2.242	-2.125	-3.453^C	-12.29^a	-12.17^a	14.51^a	-14.64^a
Other Vairables								
US								
MS	-1.579	-1.330	-1.760	-1.476	-5.643^a	-5.478^a	-5.797^a	-5.442^a
IS	-1.395	-2.360	-1.230	-2.511	-7.379^a	-7.320^a	-7.847^a	-7.776^a
PS	-0.405	-2.041	-0.370	-2.042	-3.975^b	-3.875^b	-7.935^a	-7.875^a
TS	-1.523	-2.351	-1.406	-1.940	-5.575^a	-5.551 ^{a}	-5.280 ^{a}	-5.242 ^{a}
SS	-1.281	-1.569	-1.576	-1.785	-7.447^a	-7.402 ^{a}	-7.579 ^{a}	-7.539 ^{a}
R*	-2.265	-2.169	-2.115	-1.890	-3.561^b	-3.615^b	-3.561^b	-3.659^b

Table 1: Unit Root Test from 1991: Q1 to 2006: Q2. Notes: the critical value was obtained from Mackinnon (1991) for ADF and PP. Both ADF and PP tests examine the null hypothesis of unit root against the stationarity. The following notation applies: real effective exchange rate (S) in ASEAN-5 countries via (US, UK, JP, and EU), domestic interest rate (R), foreign interest (R*) rate, inflation rate (π), domestic money supply (M1), net foreign assets (NFA), terms of trade (TOT), real gross domestic product (RGDP) and (MS) Malaysian REER, (IS) Indonesia REER, (PS)Philippines REER, (TS) Thailand REER and (SS) Singapore REER against USD . Asterisks a, b, c represent 1%, 5%, 10% significant levels, respectively. Int denotes intercept and Tre + Int denotes trend and intercept.

Country	AIC	SBC	Chosen optimal lag
Malaysia	2	1	1
Indonesia	2	1	1
Philippines	1	1	1
Thailand	2	1	1
Singapore	1	1	1

Table 2: Optimal Lag Length of RGDP Equation. Notes: AIC: Akaike Information Criteria; SBC: Schwarz Bayesian Criteria.

Indonesia: The crisis that hit Indonesia in August 1997 was a combination of political and economic factors. The economic breakdown itself was a mix of banking and external debt crises mainly centered on debt in the private sector. Indonesia is a debt-burdened economy[8] and has the weakest currency among the ASEAN-5 countries.

[8]It is known as a politically less stable country, with a high corruption rate due to its huge population and having many provinces and islands as compared to any of ASEAN countries' economy.

	Countries				
	Malaysia	**Indonesia**	**Philippines**	**Thailand**	**Singapore**
	F-statistics				
$F_{\Delta RGDP}$ (ΔRGDP, S, R, R˙,M, π , NFA, TOT)	5.70***	6.49 ***	4.48***	4.52 ***	5. 93 ***
$F_{\Delta S}$ (ΔS, R, R˙,M, π , NFA, TOT, RGDP)	1.54	1.37	1. 51	1.91	2.92
$F_{\Delta R}$ (Δ R, S , R˙,M, π , NFA, TOT, RGDP)	1.09	2.35	1.34	1.93	2.05
$F_{\Delta R^*}$ (Δ R˙, S , R ,M, π , NFA, TOT, RGDP)	1.83	2.33	1.75	1.95	1.06
$F_{\Delta M}$ (Δ M, S, R , R˙ , π , NFA, TOT, RGDP)	1.53	1.18	1.66	1.81	1.03
$F_{\Delta \pi}$ (Δ π , S , R , R˙ , M , NFA, TOT, RGDP)	1.32	1.04	1.54	1.38	1.66
$F_{\Delta NFA}$ (Δ NFA , S, R, R˙,M, π , TOT, RGDP)	1.28	2.90	2.38	1.15	2.20
$F_{\Delta TOT}$ (Δ TOT, S, R, R˙,M, π , NFA, RGDP)	1.46	2.35	2.09	1.32	1.47

Table 3: Bound Test for the Existence of Long-Run RGDP. Notes: Pesaran et al. (2001) tabulated the criteria values are 1.99-2.94 at the 90% significance level, 2.27-3.28 at the 95% significance level and 2.88-3.99 the 99% significance level. Asterisks *, **, *** denote that F-statistics falls above the 10%, 5%, 1% upper bound, respectively.

Regressors	Dependent Variable is RGDP				
	Countries				
	Malaysia	**Indonesia**	**Philippines**	**Thailand**	**Singapore**
	Coefficient [T-ratio]				
S	.155 [4.846] ***	.139 [3.962] ***	.494 [5.704] ***	0.109 [5.763] ***	.879 [3.758] ***
R	.821 [2.363] **	.0703 [1.891] *	.535 [0.9824]	.1621 [2.811] **	.742 [2.495] **
R˙	.769 [2.407] **	.0384 [.197]	.295 [1.797] *	.0696 [2.128] **	. 165 [1.378]
M1	.676 [22.81] ***	.289 [9.948] ***	.3311 [17.61] ***	.277 [6.491] ***	.972 [10.01] ***
π	. 225 [1.756] *	.057 [1.77] *	.846 [1.321]	.0310 [3.882] ***	1.3749 [2.2644] **
NFA	.0329 [.277]	-.531 [-4.639] ***	-0.1626 [-0.4308]	.0049 [1.752] *	.255 [1.451]
TOT	.641 [.382]	.619 [7.655] ***	.449 [5.293] ***	.322 [1.400]	-.445 [-4.361] ***
C	.1438 [3.104] **	-.1815 [-1.706]	.1312 [1.739]	.2710 [6.042] ***	.1659 [3.138] **
Adjusted R-squared	.9356	.9552	.9637	.9714	.9441
S.E. of regression	.0069	.0089	.0164	.0082	.0364
Sum squared resid	.0051	.0049	.0422	.0058	.0164
F-statistic	168.5	419.4	598.3	132.2	126.9
DW-statistic	2.191	2.254	1.908	2.271	2.116
PeriodNo.of Obs.	1991 Q2-2006 Q2 [61]	1991 Q2-2006 Q2 [61]	1991 Q2-2006 Q2 [61]	1991 Q2-2006 Q2 61]	1991 Q2-2006Q2 [61]

Table 4: The Selected ARDL Model: Long-Run Coefficient Estimation for ASEAN-5 Real Gross Domestic Product (RGDP) Model from 1991: Q1- 2006: Q2. Notes: Asterisks ***, **, * represent 1%, 5%, 10% significant levels, respectively. The t-ratios are reported in square brackets. The following notation applies: REER (S), domestic interest rate (R), foreign interest (R˙) rate, domestic money supply (M1), inflation rate (π), net foreign assets (NFA) and terms of trade (TOT).

The statistical results of the ARDL model for Indonesia in Table 4 indeed reflect the above scenario. As expected, its domestic money supply (M1), REER (S) net foreign assets (NFA) and TOT serve as the highest significant long-run impacts variables on Indonesia's economic growth. While, domestic interest rate (R) and domestic inflation rate (π) are the second direct important sources of economic growth. The results in the mentioned table also reflected that Indonesia traditionally borrowed a huge amount of money from the World Bank (IMF), Japan and also to some extent from European economies.[9] It further borrowed a large amount of money during the AFC. It was unable to invest the money to increase productivity effectively due to its political

instability couple with its well-known high corruption practices.

Philippines: The estimated long-run coefficients of the growth model for the Philippines are presented in Table 4. The ARDL co-integration results in the mentioned table point out that the domestic money supply (M1), REER (S) and TOT were found to have the highest significant impact variables on Philippines's economic growth throughout the study period. The M1 obviously participated as the significant leading role in the Philippines's politically unstable and developing economy, particularly during the early 1990s to the early 2000s. Its political instability for over a decade led to its poor productivity and hindered a large inflow of Foreign Direct Investments into the Philippines. Therefore, during the period, the government had to resort largely to large amounts of borrowing, especially from

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[9]Those countries include United Kingdom and Holland. These economies are its former colonial masters.

the USA, deficit budgets and also allowed a large amount of money in circulation in the country to spur economic growth [40].[10] These activities led the deterioration of the Philippine economic growth and downward fluctuation, particularly against the US economy and consequently affected its terms of trade (TOT).

Thailand: Thailand was known to be the least open developing economy among the ASEAN-5 countries, especially before the AFC. It has a limited amount of international reserves due to its political and economic instability during the 1980s and 1990's. Most of its limited reserves are in USD and Japanese Yen due to its established good relationships with these countries as its major trading partners. Owing to this situation, its closed economy and that it kept its international reserves in limited currencies, Thailand was the first ASEAN-5 economy attacked by the currency speculators in April 1996, which serves as the beginning of the AFC. The statistical results in Table 4 point out that the money supply (M1), REER (S) and π had the significant highest effect on Thailand's economic growth in the long-run, while Thailand's R, R* jointly served as the second significant impact of misalignment variables on Thailand's growth. However, other variables had different impacts during full period. The AFC eventually forced the Thailand government to borrow from the World Bank through the IMF (with prescribed conditions to the advantage of the USA and other capitalist economies; Thailand had to open up its economy and sell some of its domestic corporations to foreign participations) to manage Thailand's economic recovery plan.

Singapore: Singapore is one of the ASEAN-5 countries; it is in fact in a different category. It is a "New Industrialised Economy" or dubbed as one of the "Asian Tigers Economies". Singapore became a successful Centerport city-state after its independence in 1973; the strategic geographical location provided an opportunity for Singapore to be an international wholesale intermediary and major trading partners with many economies such as the United States. Naturally, it is also a small open free enterprise economy that depends on the world economy and international trade. The statistical results of the long-run coefficients showed that the significant variables of RGDP for Singapore are presented in Table 4, which reflected and reconfirmed the mentioned characteristics of Singapore's small open free enterprise entre-port economy. This table mentioned that the Singapore domestic money supply (M1), REER (S) and terms of trade (TOT) were the long-run significant impact of misalignment on Singapore's RGDP compared to the other variables during the study period. Moreover, the variables domestic interest rate (R) and π were the second direct important sources that also played a vital role in Singapore's economic growth.

ARDL Error Correction Model (ECM): Empirically, co-integration means that changes in the dependent variable are a function of changes in the other independent variables in the equation system. It implies that the existence of co-integration in any one variable can be targeted as a policy variable to bring about the desired changes in other variables in the system. This means that the changes in the dependent variable are also a function of the degree of disequilibrium in the co-integrating relationships, which can be captured by the error correction term (ECT). Thus, short-run deviations from a long-term equilibrium will have an impact on the changes in the dependent variable in bringing the relationship back to equilibrium once again. Hence, the ECT also provides short-term causal indications because it is derived from the long-term co-integration relationship where a short-term adjustment

made in a period is expected to bring about the necessary correction in the long-term imbalance. For this reason, this study estimated the short-run dynamic of the economic growth model for ASEAN-5 using the ARDL approach in the co-integration of relationships [6].

It can be seen from the statistical tables, Table 5 that all the selected variables were significant at the 5% significance level. The $\overline{R}^2$ suggested acceptable goodness of fit of all the RGDP equations. The results do not reject the null hypothesis of no evidence of residual serial correlation, thus serial correlation do not pose a problem. Furthermore, the DW, in turn showed the normal distribution of the data for the selected variables employed in this study. In addition, the standard error of regression, the sum of squared error and the cumulative sum of squared error were also calculated to enhance the robustness of our empirical results and our interpretations. Their very small values suggest that the RGDP for all ASEAN equations were well specified and can be conveniently interpreted.

This study re-examined the stability of the long-run parameters together with the short-run movements for each equation. To this end, we relied on cumulative sum (CUSUM) and cumulative sum square (CUSUMSQ) tests proposed by Brown. The same procedure was applied by Pesaran [35] and Bahmani-Oskooee and Ng [41] to test the stability of long-run coefficients. The tests applied to the residuals of the ECM models Table 5 along with the critical bounds are illustrated in graphical form as in Figures 1-5. The plots of CUSUM and CUSUMSQ statistics stayed within the critical 5% bounds for all equations. Neither CUSUM nor CUSUMSQ plots crossed the critical bounds, indicating no evidence of any significant structural instability. These results were the same no matter which selection criterion was used, which indicated that the RGDP functions in ASEAN-5 were stable. It's appeared to be the ASEAN-5 countries unaffected by the recent financial crisis over the sample period.

Malaysia: As presented in Table 5, the coefficients of the ECM for Malaysian RGDP during study period ranged as high as 0.714. The range suggests that the speed of Malaysia's RGDP adjustment back to its equilibrium following the disturbance was fairly rapid. The ECM coefficient showed that the speed of adjustment for Malaysia's RGDP towards its long-run equilibrium value would be corrected in one quarter.

The results in Table 5 also show that the short-run movement in all the variables of the Malaysia economic growth equation have expected signs and were significantly different from zero. For instance, Table 5 indicated that money supply (M1) and REER (S) served as the significant impact variables on Malaysia's RGDP through out of study period. It can also be seen that domestic interest rate (R), was the second most important factor in enhancing the economic growth in Malaysia.[11]

Indonesia: As presented in Table 5[12] the coefficients of the

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[10]Although, the Philippines' monetary authority simultaneously attempted to contain excessive money supply in circulation through its domestic monetary policy, the policy was not really effective.

[11] This obviously reflects the fact that Malaysia is a small, open, free enterprise capitalist economy, where M1 and S are certainly significant factors for its domestic economic growth and political stability. It imposed restrictive constraints on financial speculators' activities with an aim to protect the economic and political stability of its multicultural society. Malaysia pegged the Ringgit at MR3.8 for 1USD from September 1998 to May 2005, beside other selective credit control measures, and financed its economic activities with its domestic resources.

[12]The statistical results in Table 5 reveal that the estimated lagged error-correction terms (ECM_{-1}) in ARDL regressions for Indonesia were found to be statistically significant with correct signs, which are the necessary features for the stability of the model. The t-statistics on the lagged residual of the ECM was statistically

ECM ranged as high as 0.5073 in Indonesia suggesting that the Indonesian RGDP speed of adjustment back to equilibrium following the disturbance was fairly rapid and a high speed of adjustment for Indonesia's RGDP would be corrected within 3 quarters. Table 5 also shows that the variables domestic money supply (M1) and net foreign assets (NFA) which were positively signed indicate that these variables had the significant highest impact variables on Indonesia's RGDP during the study period. They were followed REER (S). This obviously reflects the fact that Indonesia owing to its heavy debt economy, the AFC really provided "a serious wake-up call" against its economy. Nevertheless, it had to accept an additional burden of debt from IMF in USD to manage its economic crisis during and after the AFC.

Philippines: The statistical results depicted in Table 5 in general, indicated that the estimated lagged error-correction term (ECM) significant. This further reinforced our findings that the selected variables under consideration were co-integrated. The coefficient of error correct term ECM_{-1} had the correct sign and was highly significant.

for the Philippines[13] implied that the speed of adjustment back to equilibrium following the disturbance was fairly slow, about one year. The statistical results in the mentioned Table 5 that showed the Philippine domestic money supply (M1) and REER (S) indicated that these variables had the largest impact variables on Philippines' RGDP short-run throughout the study period. It was followed by TOT. These variables were constantly being adjusted with a few other selected variables by the Philippines Monetary Authority to manage the short-term Philippine RGDPs.

Thailand: The presented results in Table 5 showed that the estimated lagged error-correction terms (ECM_{-1}) in ARDL regressions for Thailand against the four countries appeared to be negative and statistically significant, which are features necessary for model stability.

[13]They appeared to be negative and statistically significant, a feature necessary for the stability of the model. The t-statistics on the lagged residual in the ECMs was statistically significant, again reinforcing the finding that the variables under consideration were co-integrated.

Regressor	Dependent Variable ΔGDP				
	Countries				
	Malaysia	**Indonesia**	**Philippines**	**Thailand**	**Singapore**
	Coefficient [T-ratio]				
ECM(-1)	-.7146 [-4.712] ***	-.5073 [-4.121]***	-.4607 [-2.891] ***	-.5375 [-4.019] ***	-.7459 [-5.770] ***
ΔS	.0913 [3.945] ***	.3361[2.002] **	.1012 [3.473] ***	.0571 [2.881] **	.2874 [3.929] ***
ΔR	0.4587 [2.494]**	.0374 [1.895] *	.1437 [1.924]	.0892 [1.775] *	.6624 [2.137] **
Δ R˙	.4591 [1.731]*	.0102 [0.169]	.0942 [2.591] *	.0319 [2.013] *	. 1176 [1.847] *
ΔM1	.6467 [9.165] ***	.8303 [4.691] ***	.2513 [6.216] ***	.2961 [6.674] ***	.6683 [5.429] ***
Δ π	. 1465 [1.702] *	. 1795 [0.951]	.2389 [1.753] *	. 1971 [3.821] ***	.3452 [2.312] **
ΔNFA	. 16342 [1.678] *	-.3345 [-4.750] ***	-.0562 [-.694]	.0028 [1.870] *	0.2291 [1.293]
ΔTOT	.1531 [.295]	.0291 [1.801] *	1.2021 [2.284] **	.0125 [.557]	-15.251[-2.183] **
C	-.1067 [-2.782] **	.0418 [.8553]	-.3007 [-2.725] **	-.4531 [-3.451] ***	-.8421 [-4.106] ***
Adjusted R-squared	.8023	.7621	.7924	.7534	8556
residual serial correlation	0.4681 [.503]	. 1421 [.253]	.0013 [.914]	.0630[0.827]	. 2760[.123]
S.E. of regression	.0116	.0293	.0099	.0402	.0141
Sum squared resid	.0072	.0354	.0058	.0771	.0067
DW-statistic	5.828	8.901	7.405	43.13	11.61
F-statistic	2.014	1.821	2.721	1.789	2.286
Period No. of Obs.	1991 Q2-2006 Q2 [61]	1991 Q2-2006 Q2 [61]	1991 Q2-2006 Q2 [61]	1991 Q2-2006 Q2 [61]	1991 Q2-2006 Q2 [61]

Table 5: Error correction Representation for the Selected ARDL Model: Short-Run Estimation for ASEAN-5 Real Gross Domestic Product (RGDP) Model from 1991: Q1-2006: Q2. Notes: The t-ratios are represented in squire brackets. Asterisks ***, **, * represent 1%, 5%, 10% significance levels, respectively. Δ denotes the first difference of each variable. The following notation applies: real effective exchange rate (S), domestic interest rate (R), foreign interest rate (R˙), domestic money supply (M1), inflation rate (π), net foreign assets (NFA) and terms of trade (TOT).
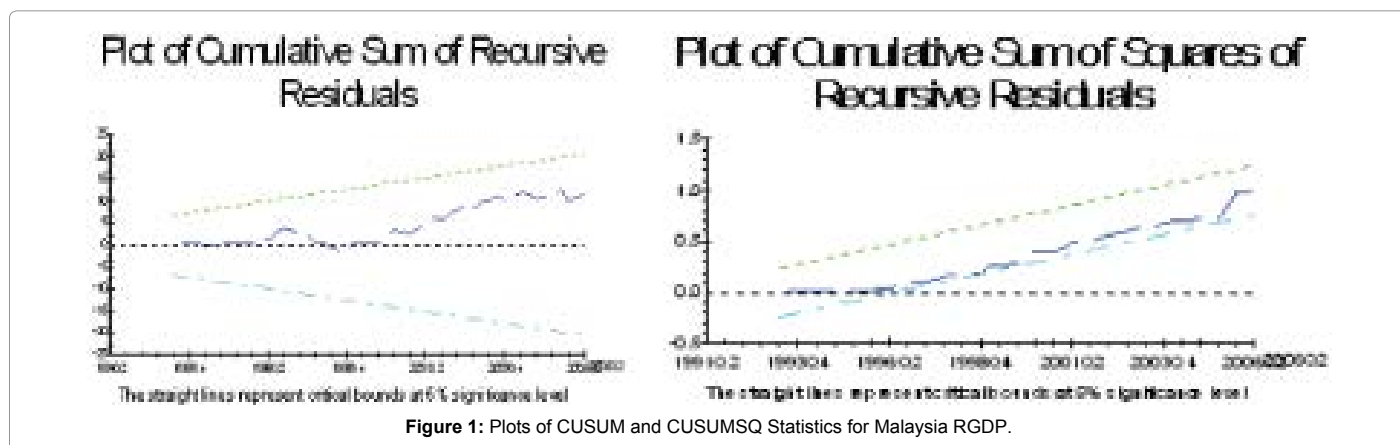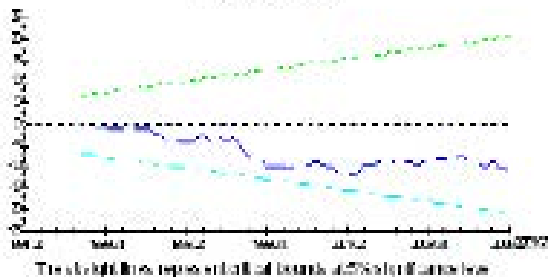

Figure 1: Plots of CUSUM and CUSUMSQ Statistics for Malaysia RGDP.
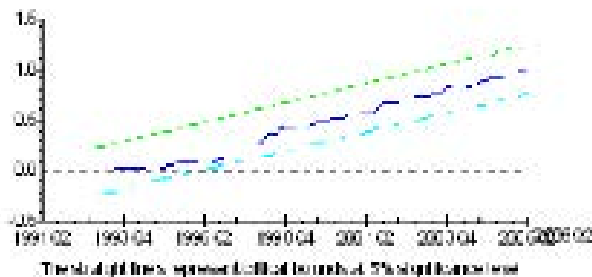
Figure 2: Plots of CUSUM and CUSUMSQ Statistics for Indonesia RGDP.
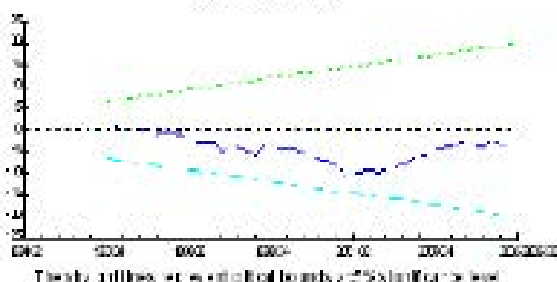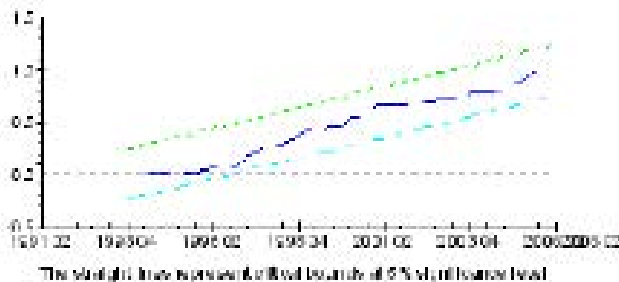
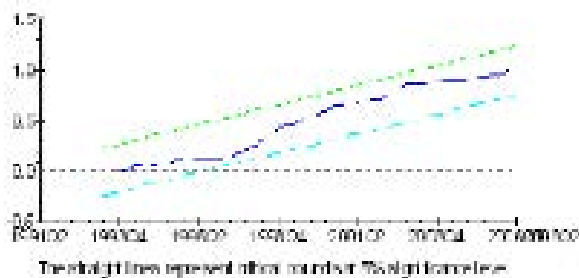**Figure 3:** Plots of CUSUM and CUSUMSQ Statistics for Philippines RGDP.
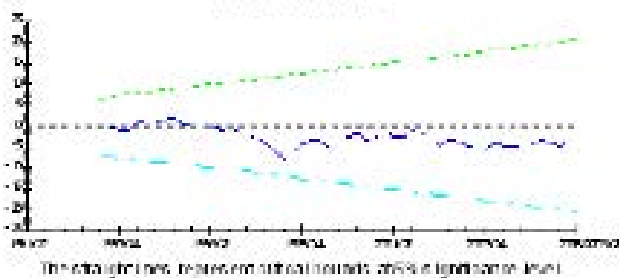
Figure 4: Plots of CUSUM and CUSUMSQ Statistics for Thailand RGDP.

Moreover, these results in Table 5 reveal that the speed of adjustment of Thailand's RGDP back to equilibrium following the economic and financial disturbance were fairly rapid, within 3 quarters or 9 months. As a result, domestic money supply (M1) and inflation rate (π) emerged to serve as the significant impact short-run variables upon Thailand's economic growth as shown by the statistical results in Table 5. However, the results mentioned that the REER (S) of Thailand serve as the second significant impact variable.[14]

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[14]Thailand was one of the worst AFC victims among the ASEAN members. As a consequence, it was essentially forced to open its economy to foreign investors and international corporation as one of the preconditions prescribed by the IMF

Singapore: Unlike other ASEAN-5 economies, Singapore is a small, city-state, entre-port, highly open and known as one of the new industrialised economies together with Hong Kong, Taiwan and South Korea. Thus, its economy served in a different dimension than the rest of the ASEAN-5 economies. Table 4 clearly describe the differences. Moreover, the coefficients of the lagged ECM of Singapore range as high

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and the World Bank before it could be assisted with recovery funds. Consequently, its considerable increase in credit caused by large capital inflows resulted in a rapid growth in Thailand's money supply. Since the funding supply was growing much faster than what could be utilized in productive investments, much of the funds went into investments in speculative assets (especially property and shares), whose prices then rose significantly.

Figure 5: Plots of CUSUM and CUSUMSQ Statistics for Singapore RGDP.
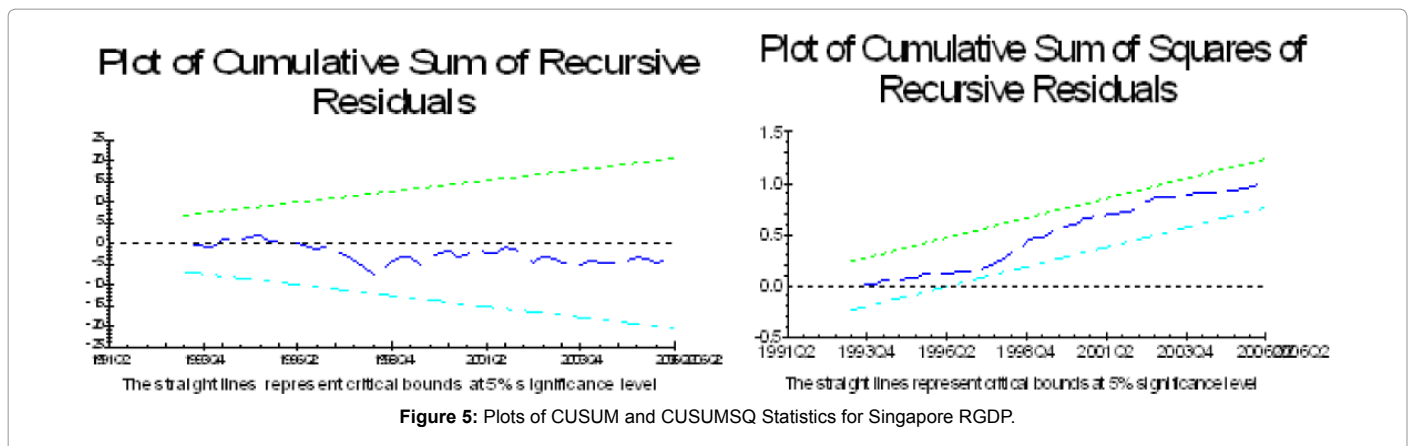
as 0.7459 suggesting that the speed of adjustment back to equilibrium following a disturbance is fairly rapid. Singapore is a small open free enterprise economy pragmatically and had the best financial market in the region, thus, money supply (M1) lead its growth. In addition, Singapore depended on re-export of the products that were imported from other countries such as Malaysia, Indonesia, Thailand and the Philippines. The results in Table 5 revealed that the domestic money supply (M1) and REER (S) had a significant impact of variables on Singapore's short-run economic growth throughout the study period. Furthermore, the R, π and TOT served as second significant variables on Singapore economic growth.

Limitation of the Study

The study is not without limitations. First, the study employed quarterly data in the analysis with different periods because of availability of the data in quarterly form. The size of the sample has been a limiting factor in this work. If the data are available in the desired monthly bases, more conclusive results could be obtained, and other relevant variables could be added to the model such as the private and public investment and savings on REER and economic growth. Second, the data were collected from different sources, and that could affect the quality of the data used in this study. For example, the time series data were collected from International Financial Statistics of IMF, DataStream, and central banks of ASEAN-5 countries. Therefore, this could affect the quality of data due to different base years in calculating the values and or approximation process.

Finally, the analysis of this study is based on the ARDL technique. It is important to mention that the ARDL technique has its own limitation. The basic assumption maintained in the analysis is that the relationship between the variables in the model is linear. However, more recent evidence has shown that some of the macroeconomic variables utilized in the present study had non-linear relationship and were generated by non-linear processes. In this study, all the variables were assumed to be generated by a linear process primarily because of the short data span available for this study.

Conclusions and Policy Implications

This study examined the impacts of real effective exchange rate, domestic interest rate, foreign interest rate, inflation rate, domestic money supply, net foreign assets, and terms of trade (TOT) on economic growth, particularly within the context of the ASEAN-5 countries. The methodology used in this study is more reliable and robust. From the statistical point of view, this study utilized the most

recent technique to investigate the issues of the thesis consideration. Besides the co-integration approach the autoregressive distributed lag approach to co-integration (ARDL) developed by Pesaran et al. [6,35] was utilized in this study. This technique was critically used to explore the long-run and short-run relationships. It should be noted here that ARDL approach has some additional advantages. It yields consistent estimates on the long-run coefficients that are asymptotically normal irrespective of whether the underlying regressors are I(0), I(1) or mutually integrated.

The major findings and contributions of this study are that the domestic money supply (M1) followed by REER (S) are the long-term and short- run variables that had positive and significant impact on ASEAN-5 countries' real domestic products' growth rate. The other identified variables by the earlier researchers had diverse impacts during the full study period, their impact on economic growth of the study countries over the period vary in accordance to the contemporary businesses and economics environments. Hence, they were not the impact variables to economic growth of the ASEAN-5. Thus, this empirical study point out that M1 and REER were the high impacts variables for the ASEAN-5 economic growth. Hence, our empirical results essentially in line with the earlier researchers who found that the developing economies, in general, are heterogeneous. Thus, the significant variables on RGDP should differ accordingly to each country's economic environments. Thus, our empirical results are also similar to the earlier empirical findings including those findings by Dimitris and Christopoulos [18], David and Guillermo [20], Justin et al. [21] and Julian and Jay [8].

A number of policy implications can be derived from the above analysis. First, as the results suggest, ASEAN countries are mostly tied to the economy of the United States their major trading partner. This implies that the ASEAN economies could be easily affected by external changes positively or negatively, depending on the types of the changes that come from this major trading partner economy. Thus, the policymakers in the respective ASEAN-5 economies therefore, need to constantly monitor and sensitive to their trading partner economic environments. Indeed, they also need to constantly and continuously re-examine the identity of their long- and short-run impact variables from time to time because these determinants change according to the contemporary environment. Second, the policymakers need to understand the behaviour of these significant impact variables to enable them to manage their REER in order to retain their economies' competitive advantages in the current era of globalization and an integrated world economy. Third, the identify

of long-run impact variables must be constantly identified. They are essential to the policymakers to assess, to manage to develop and to use these variables for benefits of their long-run financial targets in order to promote their respective long-term economics growth. The identify of short-run impact variables are also essential for the contemporary remedy of the contemporary economic situations. Nevertheless, the policymakers should indeed integrate their policy actions: short- and long-term together to achieve the economic mission of their respective economies.

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