Demand For International Reserves in ASEAN-5 Economies

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1. Introduction

After the Asian financial crisis in 1997-1998, the five ASEAN countries, namely Indonesia, Malaysia, the Philippines, Singapore, and Thailand, had increased their holdings of international reserves. International reserves holdings in ASEAN5 economies had been increasing since in the early 1990s but a sharp rise was observed after the crisis. Among the ASEAN5, Singapore showed the highest demand for international reserves both in terms of US dollars and when reserves are scaled to GDP followed by Malaysia. In 2005, Singapore's international reserves stood at US$116 billion (104% of GDP) while the international reserves in Malaysia were recorded at US$70 billion (63% of GDP). In Indonesia, demand for international reserves increased by more than 100% since after the crisis from US$17 billion (9% of GDP) in 1997 to US$35 billion (18% of GDP) in 2003 and 2004. The Philippines showed the lowest demand in terms of US dollars (US$16 billion).

These countries also experienced consistent current account surplus (with some exception in the cases of the Philippines and Thailand) at least until 2005. The rise in the demand for international reserves during the period with current account surplus is associated with the problem of savings-investment imbalance in the region since countries with current account surplus have higher savings than investment. The savings-investment gap had widened, especially in Malaysia and Singapore, reflecting the rise in their current account surplus in recent years. The gap was around 20% and 15% in Malaysia and Singapore, respectively, at the end of 2005.

Based on the above discussion, it can be inferred that the high demand for international reserves in the ASEAN5 economies coincides with the period with current account surplus. An interesting question that this study attempts to answer is whether current account surplus leads to the rise in the demand for international reserves in these countries. Therefore the main objective of the present study is to empirically analyze the impact of current account imbalance on the demand for international reserves in the ASEAN5 economies.

This study differs from the previous studies in two aspects. First, the study uses the ARDL bounds testing approach to cointegration to estimate the reserve demand. This methodology has not been widely applied in this area of research. Previous studies on the demand for international reserves for individual countries usually employ the Ordinary Least Square (OLS) and the cointegration techniques developed by Engle and Granger (1987), Johensen (1988), and Johensen and Juselius (1990). One of the advantages of the ARDL approach to cointegration is that it can be applied regardless of whether the regressors are I(0) or I(1) (Pesaran, Shin, and Smith, 2001). This approach can be applied to studies with small sample sizes (Mah, 2000).

Second, most studies on the demand for international reserves for developed and developing countries are based on cross-country or panel data analysis. Only a few studies are conducted for individual countries. Even though there are studies that analyze the reserve demand for individual Asian countries, for instance China (Huang, 1995; and Wei and Zhu, 2000), India (Ramachandran, 2004, 2006; Ramachandran and Srinivasan, 2007; and Prabheesh, Malathy, and Madhumati, 2008), Korea (Aizenman, Lee, and Rhee, 2007; Jo, 2007; and Ra, 2007), and Taiwan (Huang and Shen, 1999), there is still lack of studies on the demand for international reserves for individual ASEAN countries. Therefore, the present study attempts to fill up this gap in the literature.

The remainder of this paper is organized as follows. Section Two reviews recent empirical literature on the demand for international reserves. Section Three summarizes the data and methodology to be employed in this study. The major findings are presented in Section Four. The final section concludes the paper.

2. Review of the Literature

This section provides a review of some empirical literature on the demand for international reserves for individual countries. There has been an increasing number of studies using time series data since in the 1990s. These studies have addressed several issues associated with the demand for international reserves. These issues include: (1) the transactions, precautionary, and mercantilist motives for holding reserves; (2) the opportunity cost of holding reserves; and (3) the role of reserves as a buffer stock.

For instance, Bandinger (2004) estimates the demand for international reserves in Austria using quarterly data for the period 1985Q1-1997Q4 and he finds strong economies of scale of holding reserves and concludes that the transactions motive represents the foreign exchange demand by the private sector.

The precautionary motive for holding reserves has been tested using quarterly data for Korea during 1994-2003 (see Aizenman, Rhee, and Lee, 2007). The empirical results suggest that the Korean holding of international reserves after the 1997 financial crisis is consistent with the precautionary motive. Applying the dynamic ordinary least square (DOLS) and Johensen and Juselius (1990) cointegration approach for the Korean time series data during 1990-2005, Ra (2007) concludes that the opportunity cost for holding reserves is inversely related to the demand for international reserves during the pre-crisis and the whole sample period.

Ramachandran and Srinivaran (2007) and Ramachandran (2004, 2006) utilize the buffer stock model developed by Frenkel and Jovanovic (1981) to analyze the demand for international reserves for India and they discover that this model predicts well the reserve demand for India. Similarly, Cifarelli and Paladino (2006) also estimate reserve demand

based on the buffer stock model using Johensen cointegration approach for ten Asian and Latin American emerging economies. They conclude that the high demand for international reserves in these countries is associated with the "fear of floating" and mercantilist motive.

3. Methodology and Data

Following Frenkel (1974a), the demand for international reserves is a function of a scale variable, propensity to import, and the variability measure. The scale variable is expected to have a direct relationship with the demand for international reserves since it is expected that the demand for international reserves should increase with a rise in the volume of international transactions. Marginal propensity to import can have a positive or negative relationship with reserve demand. A positive relationship indicates that propensity to import acts as a proxy for the openness of an economy (Frenkel, 1974b) while a negative relationship indicates that the variable becomes a proxy for the marginal cost of adjustment (Huang, 1995).

Besides these three explanatory variables, two additional variables are included in the model: current account balance and total external debt. The relationship between international reserves and current account balance is based on the theories presented by Dunn and Mutti (2000), McCauley (2003), and Taniuchi (2006). It has been argued that emerging economies accumulate reserves during the period with current account surplus through the foreign exchange market intervention to avoid serious appreciation of their currencies. Specifically, the monetary authorities purchase foreign exchange and sell domestic currencies to maintain a stable exchange rate. This would help these countries to retain their export competitiveness. On the other hand, when the current account is in deficit, central banks would sell foreign exchange. This would result in the decline in the demand for international reserves. The inclusion of total external debt in the model is in line with the theories developed by Aizenman, Rhee, and Lee (2004) and Alfaro and Kanczuk (2007). If the relationship between total external debt and international reserves is positive, the former is a complement for the latter. Otherwise, the former becomes a substitute for the latter.

Based on the theories presented above, the proposed model of the demand for international reserves for ASEAN5 economies is developed as follows:

$$\ln R_t = \beta_0 + \beta_1 \ln YCAP_t + \beta_2 \ln PIM_t + \beta_3 \ln XVOL_t + \beta_4 \ln CA_t + \beta_5 \ln DEBT_t + \varepsilon_t \quad (1)$$

where lnR is the ratio of international reserves to GDP; lnYCAP is the real GDP per capita (scale variable); lnPIM is the average propensity to import (imports/GDP); lnXVOL is the variability in real export receipts; lnCA is the ratio of current account balance to GDP; and lnDEBT is the ratio of total external debt to GDP. All variables are expressed in logarithms.

The existence of cointegration relationship for the demand for international reserves is estimated using the ARDL bounds test developed by Pesaran, Shin, and Smith (2001). The unrestricted error correction model (UECM) based on equation (1) is developed as follows:

$$\ln \Delta R_t = \beta_0 + \theta_1 \ln R_{t-1} + \theta_2 \ln YCAP_{t-1} + \theta_3 \ln PIM_{t-1} + \theta_4 \ln XVOL_{t-1} + \theta_5 \ln CA_{t-1} + \theta_6 \ln DEBT_{t-1} + \sum_{k=1}^{a} \lambda_{1,k} \Delta \ln R_{t-k} + \sum_{k=0}^{b} \lambda_{2,k} \Delta \ln YCAP_{t-k} + \sum_{k=0}^{c} \lambda_{3,k} \Delta \ln PIM_{t-k} + \sum_{k=0}^{d} \lambda_{4,k} \Delta \ln XVOL_{t-k} + \sum_{k=0}^{e} \lambda_{5,k} \Delta \ln CA_{t-k} + \sum_{k=0}^{e} \lambda_{6,k} \Delta \ln DEBT_{t-k} + \varepsilon_t \quad (2)$$

The long run elasticities are calculated by dividing the coefficient of the first lag of the independent variable by the coefficient of the first lag of the dependent variable (Bardsen, 1989). There are three steps in the ARDL bounds test. First, equation (2) is estimated using Ordinary Least Square (OLS). Second, Wald tests are conducted to test for the existence of long run relationship between the demand for international reserves and its determinants. This test is performed by imposing restrictions on the long run coefficients of lnR, lnYCAP, lnPIM, lnXVOL, lnCA, and lnDEBT. The null and alternative hypotheses for equation (2) are constructed as follows:

H_0: $\theta_1 = \theta_2 = \theta_3 = \theta_4 = \theta_5 = \theta_6 = 0$ (There is no long run level relationship)
H_1: $\theta_1 \neq \theta_2 \neq \theta_3 \neq \theta_4 \neq \theta_5 \neq \theta_6 \neq 0$ (There is long run level relationship)

The computed F-statistic from the Wald test is compared with the critical values from Pesaran *et al.* (2001) and Narayan (2005). The lower critical value assumes that the regressors are integrated of order zero or I(0) while the upper critical value assumes that the regressors are integrated of order one or I(1). If the calculated F-statistic from the Wald test is greater than the upper critical value, the null hypothesis of no long run relationship will be rejected. If the calculated statistic is less than the lower critical value, the null hypothesis will not be rejected. If the calculated value falls within the upper and lower critical values, the result of the test is inconclusive. The selection of model is based on the Hendry's (1991) general to specific approach.

This study utilizes annual data covering the period of 1970-2005. Reserves, current account balance, and total external debt are scaled by GDP. This is to allow comparison across different sizes of economy (Cheung and Qian, 2007). Following Edison (2003), export volatility is measured by three-year rolling standard deviation of real export receipts. Data on international reserves (excluding gold), real GDP per capita, imports, exports, and current account balance are obtained from the International Monetary Fund International Financial Statistics (2007) and data on total external debt are collected from World Bank World Development Indicators (2007) and Asian Development Bank Key Indicators (various issues).

4. Discussion of Findings

Table 1 presents the results of the UECM for the long run coefficients based on equation (2). The goodness of fit of the models (adjusted R-squared) and the standard error of regression remain superior in all models. The short run coefficients of the UECM results

are presented in Table A1 in the Appendix. Diagnostic tests such as Breusch-Godfrey serial correlation test, ARCH test, Ramsey RESET specification test, Jacque-Bera normality test, and stability tests (CUSUM and CUSUM of Square tests) are performed to test for the adequacy of the models. All models have passed these tests. The results of diagnostic tests are summarized in the lower panel of Table 1 and Table A2 in the Appendix.

Table 2 summarizes the results of the ARDL bounds tests based on equation (2). The calculated F-statistics for all five countries are greater than the upper critical values at least at 5% and 10% levels of significance based on Pesaran et. al. (2001) and Narayan (2005), respectively. Therefore the null hypothesis of no cointegration can be rejected for all cases and we conclude that there is a long run level relationship between the demand for international reserves and its determinants for Indonesia, Malaysia, the Philippines, Singapore, and Thailand.

The long run elasticities calculated based on equation (2) are presented in Table 3. GDP per capita (lnYCAP) is significant and positive in the cases of Indonesia and Thailand. The positive relationship indicates that the demand for international reserves rises with the rise in the volume of international transactions.

Propensity to import (lnPIM) is significant in affecting reserve demand in all sample countries except in the case of Indonesia. The coefficient sign is positive for Malaysia and the Philippines but negative in the cases of Singapore and Thailand. Therefore, lnPIM represents the openness of the economy for the first two countries and the variable acts as a marginal cost of adjustment for the last two countries.

The relationship between export volatility and the demand for international reserves is positive and significant only the case of Indonesia. This implies that the demand for international reserves rises with an increase in the volatility of export receipts in this country.

Current account balance shows a significant positive impact on the demand for international reserves in Indonesia, Malaysia, and Singapore. The positive relationship implies that a rise in the current account surplus leads to a rise in the demand for international reserves in these countries. The impact of current account balance on the demand for international reserves is highest in Indonesia followed by Singapore and Malaysia. A 1% increase in the current account surplus would result in the rise in the demand for international reserves by 0.56%, 0.54% and 0.27% in Indonesia, Singapore, and Malaysia, respectively. These results are consistent with the fact that these countries were experiencing huge current account surplus in recent years.

In the case of the Philippines, the current account recorded deficits since 1987 until 2001, except in 1998. The current account of the Philippines shifted to surplus after 2002 and remained in surplus until, at least, to 2005. However, the surplus totaling to only US$3 billion during 2003-2005. This surplus was relatively small as compared to the surplus in the rest of sample countries. This fact may explain the insignificant impact of current account balance on reserve demand in the Philippines.

The insignificance of current account balance in Thailand may be associated with the inverse movement between international reserves and the current account. The ratio of reserves to GDP in Thailand was moving upward (from 26% in 1998 to 30% in 2002-2005) while the ratio of current account balance to GDP was moving downward (from

13% in 1998 to 4% in 2004). Furthermore, the Thailand's current account had shifted to a deficit amounting to US$7.8 billion in 2005 (data from IFS and WDI).

The demand for international reserves would decline with the rise in the total external debt holdings in the Philippines. In other words, total external debt is a substitute for international reserves in this country. A 1% increase in total external debt would lead to the decline in the demand for international reserves by 1.2% in the Philippines. Total external debt is not significant in the rest of the countries.

Table 1. Long run coefficients of the UECM results based on equation (2)

Variable	Indonesia	Malaysia	The Philippines	Singapore	Thailand
Constant	-7.2662**	-1.5781	-16.1618	0.4534	-6.3411*
	(-2.1898)	(-0.4408)	(-1.4424)	(0.3177)	(-2.0436)
$\ln R_{t-1}$	-1.2229***	-0.9573***	-1.1027***	-0.6052**	-0.1525*
	(-4.0165)	(-4.1352)	(-4.1347)	(-2.5103)	(-1.8436)
$\ln YCAP_{t-1}$	0.9284**	0.1334	2.1489	-0.0154	0.6830*
	(2.4470)	(0.3111)	(1.3812)	(-0.1076)	(1.7939)
$\ln PIM_{t-1}$	0.4991	0.7429*	1.8541***	-0.2856**	-0.7276**
	(1.1606)	(1.9218)	(4.7293)	(-2.2295)	(-2.4968)
$\ln XVOL_{t-1}$	0.2357***	0.0060	0.1322	-0.0182	0.0049
	(3.0022)	(0.0647)	(1.2375)	(-0.5969)	(0.0996)
$\ln CA_{t-1}$	0.6853***	0.2614***	0.0830	0.3304***	-0.1170
	(3.2721)	(3.9370)	(0.4646)	(3.3574)	(-1.6733)
$\ln DEBT_{t-1}$	0.2010	-0.0775	-1.2785***	0.0507	-0.0664
	(0.7600)	(-0.6501)	(-4.3313)	(0.9053)	(-0.4091)
Adjusted R^2	0.6255	0.5948	0.6568	0.5940	0.6032
AIC	0.1190	-1.0397	0.2640	-2.7159	-1.5221
Std. error of regression	0.2208	0.1234	0.2374	0.0534	0.0970
F-statistic	4.1436	3.9353	4.6023	4.1215	4.2430
Probability (F-statistic)	0.0041	0.0046	0.0024	0.0032	0.0027
Diagnostic Tests					
Serial correlation test	1.1752 [0.3395]	2.5919 [0.1102]	0.8293 [0.4543]	0.4653 [0.6367]	2.1512 [0.1509]
ARCH test	0.3353 [0.7179]	0.3188 [0.7296]	1.2901 [0.2911]	0.7360 [0.4881]	0.3770 [0.6894]
Normality test	2.8036 [0.2462]	0.1290 [0.9376]	0.4377 [0.8034]	1.9393 [0.3792]	2.8626 [0.2390]
Ramsey RESET test	1.0885 [0.3145]	2.8330 [0.1130]	1.9510 [0.1745]	0.0513 [0.9502]	0.5078 [0.6118]

Note: ***, **, and * indicate significant at 1%, 5%, and 10% levels, respectively. lnR is the ratio of international reserves to GDP, logged; lnYCAP is real GDP per capita, logged; lnPIM is average propensity to import (imports/GDP), logged; lnXVOL is volatility of real export receipts, logged; lnCA is the ratio of current account balance to GDP, logged; and lnDEBT is the ratio of total external debt to GDP, logged. Figures in parentheses ( ) and square brackets [ ] are the t-statistics and p-values, respectively. Serial correlation test, ARCH test, and Ramsey RESET test are performed at lag two.

Table 2. Results of the ARDL bounds test based on equation (2)

Country	Computed F-Statistic			
Indonesia	$4.1940^{b(c)}$			
Malaysia	$3.9031^{b(c)}$			
The Philippines	$4.5439^{b(b)}$			
Singapore	$4.1094^{b(c)}$			
Thailand	$5.0941^{a(b)}$			
Unrestricted Intercept and No Trend	Critical Values			
	Pesaran et al. (2001)		Narayan (2005)	
Significance level	Lower Bound	Upper Bound	Lower Bound	Upper Bound
	(k=5)		(k=5; n=35)	
1%	3.41	4.68	4.26	6.04
5%	2.62	3.79	3.04	4.44
10%	2.26	3.35	2.51	3.76

Note: [a], [b], and [c] indicate significant at 1%, 5%, and 10% levels, respectively. Superscripts outside and inside parenthesis indicate significance levels based on Pesaran et al. (2001) and Narayan (2005), respectively. Critical values are taken from Pesaran et al (2001), Table CI(iii) Case III, p. 300, and Narayan (2005), Table in the Appendix, Case III, p. 1988.

Table 3. Long run elasticities based on equation (2)
(Dependent Variable: Reserves/GDP (lnR))

	Indonesia	Malaysia	The Philippines	Singapore	Thailand
lnYCAP	0.7591**	0.1393	1.9488	-0.0254	4.4796*
lnPIM	0.4081	0.7761*	1.6814***	-0.4718**	-4.7719**
lnXVOL	0.1928***	0.0062	0.1199	-0.0301	0.0322
lnCA	0.5604***	0.2730***	0.0752	0.5459***	-0.7672
lnDEBT	0.1644	-0.0810	-1.1594***	0.0838	-0.4357

Note: ***, **, and * indicate significant at 1%, 5%, and 10% levels, respectively. lnYCAP is real GDP per capita, logged; lnPIM is average propensity to import (imports/GDP), logged; lnXVOL is volatility of real export receipts, logged; lnCA is the ratio of current account balance to GDP, logged; and lnDEBT is the ratio of total external debt to GDP, logged.

Total external debt does not have any significant effect on the demand for international reserves in the cases of Indonesia, Malaysia, Singapore, and Thailand. Some possible explanation for such findings can be offered. Indonesia was able to reduce its total external debt burden from US$151 billion (97% of GDP) in 1998-1999 to an average of US$136 billion (74% of GDP) during 2001-2004. The reduction is mainly due to the reduction in the long term debt of the private sector from US$55 billion in 1998 to an average of US$32 billion in 2001-2004 (ADB Key Indicators, 2006). The government has taken steps in rescheduling its external debt and also the external debt of the private sector. Under the Paris Club and London Club Agreements, the government was allowed to reschedule its external debt repayments. Besides, the Frankfurt Agreement was signed

on the 4th June of 1998 to assist the private sector in resolving its external debt burden (Kusumaningtuti, 2004).

In the case of Malaysia, there had been a decline in the private sector's long term external debt from US$18 billion in 2000 to an average of US$14 billion during 2001-2004 (ADB Key Indicators, 2006). There are at least two reasons that could explain the insignificance of total external debt in Singapore. First, the Singaporean government has not taken any external financing since 1996. This may be due to the policy of the government to maintain budget surplus. The government budget has been in consistent surplus since 1988 (ADB Key Indicators, various issues). Second, even though the levels of external debt have grown in recent years, Singapore is a net creditor in all trade credit transactions, debt securities, FDI-related loans, and loans to other non-residents (Kapur, 2005).

The short run causality based on equation (2) is presented in Table 4. In the short run, lnYCAP is significant only in the case of the Philippines while lnPIM is significant in all sample countries. lnXVOL is significant in affecting the demand for international reserves in the cases of the Philippines and Singapore. lnCA is significant in all of the ASEAN countries except Thailand while lnDEBT debt does not show significant impact on the demand for international reserves in the short run except in the case of Thailand.

Table 4. Short run causality based on equation (2)

	Indonesia	**Malaysia**	**The Philippines**	**Singapore**	**Thailand**
ΔlnYCAP	0.3155	0.9786	5.5498**	0.9798	1.2033
	[0.5826]	[0.3373]	[0.0157]	[0.3956]	[0.3245]
ΔlnPIM	4.6425**	3.6751**	10.013***	2.9755*	3.7690**
	[0.0270]	[0.0486]	[0.0017]	[0.0780]	[0.0442]
ΔlnXVOL	1.2041	1.4650	3.0543*	4.1624*	1.0588
	[0.8981]	[0.2616]	[0.0771]	[0.0572]	[0.3179]
ΔlnCA	6.5017***	3.7047**	6.9643**	7.1919***	2.8811
	[0.0049]	[0.0476]	[0.0186]	[0.0054]	[0.1078]
ΔlnDEBT	1.9684	1.9103	1.9886	1.5174	6.3103***
	[0.1741]	[0.1859]	[0.1714]	[0.2348]	[0.0089]

Note: ***, **, and * indicate significant at 1%, 5%, and 10% levels, respectively. lnYCAP is real GDP per capita, logged; lnPIM is average propensity to import (imports/GDP), logged; lnXVOL is volatility of real export receipts, logged; lnCA is the ratio of current account balance to GDP, logged; lnDEBT is the ratio of total external debt to GDP, logged. Δ is the first difference operator. Figures in square brackets [ ] are the p-values.

5. Conclusion

This paper examines the demand for international reserves in the ASEAN5 economies, namely Indonesia, Malaysia, the Philippines, Singapore, and Thailand, during the period of 1970-2005. The ARDL bounds testing approach developed by Pesaran et. al. (2001) is utilized to test for the existence of cointegration relationship between the demand for international reserves and its determinants (GDP per capita, average propensity to import, export volatility, current account balance/GDP, and total external debt/GDP). The empirical results indicate that there is a long run relationship between the demand for international reserves and its determinants in the five ASEAN economies.

An important conclusion can be drawn from the empirical findings is that current account balance is significant and positively related to the demand for international reserves in Indonesia, Malaysia, and Singapore. In other words, current account surplus leads to the rise in the demand for international reserves in these countries.

Current account surplus is the excess savings by the private sector. Therefore, it is expected that the private sector will use these savings to finance their investment. However, due to the less developed financial markets in the region, the private sector may have limited ability to transform their savings into investment. As a result, the public sector acts as an intermediary for the private sector to recycle the savings into investment. In particular, the public sector has transformed these savings into investment in foreign currency assets in the form of the build up of international reserves (Genberg, McCauley, Park, and Persaud, 2005, p. 13).

The build up of reserves represents the investment in foreign currency assets, especially the US dollar denominated assets, by central banks. This is because nearly 70% of international reserves are denominated in the US dollars (World Bank, 2005; Genberg et al, 2005, p. 30). These reserves are usually invested in high liquidity and low return assets such as the US treasury bills and bonds (Oh, Park, Park, and Yang, 2003; World Bank, 2005). Such investment of reserves represents capital outflows from East Asia to the US. These outflows of savings could be a loss of opportunities to these countries since the returns on reserves may be lower than the returns on alternative investments at home. Therefore part of reserves may be used to finance investment at home such as on health, education, and infrastructure. Such investment may minimize the savings-investment imbalance and promote long term economic growth in these countries.

Appendix

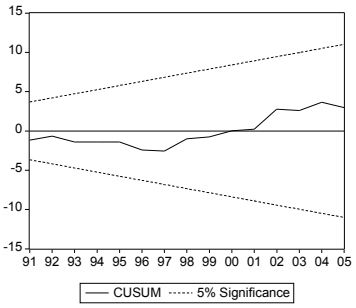
Table A1. Short run coefficients of the UECM results based on equation (2)

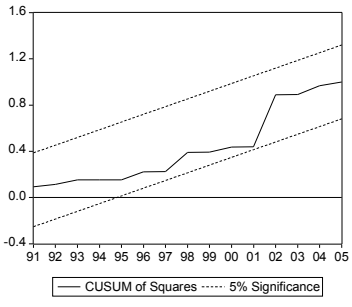
Variable	Indonesia	Malaysia	The Philippines	Singapore	Thailand
ΔlnR_{t-1}	0.2749	0.4647**	0.2868		
	(1.1370)	(2.4577)	(1.0874)		
ΔlnR_{t-2}	0.2692		0.1915	0.4111*	0.2582
	(1.4359)		(0.9590)	(1.8851)	(1.4885)
$\Delta lnYCAP_t$			8.4343**		
			(2.6870)		
$\Delta lnYCAP_{t-1}$			-6.8786***	0.3222	-0.5912
			(-3.0537)	(0.6022)	(-0.6875)
$\Delta lnYCAP_{t-2}$	1.6767	0.8387		0.6555	-1.0757
	(0.5617)	(0.9892)		(1.3310)	(-1.1739)
$\Delta lnPIM_t$		0.3914	2.8458***	0.5840**	0.2865
		(1.6840)	(4.4545)	(2.1778)	(1.4784)
$\Delta lnPIM_{t-1}$	-0.6127	-0.5043*		-0.1498	0.6609**
	(-1.4620)	(-1.7538)		(-0.7252)	(2.5833)
$\Delta lnPIM_{t-2}$	-1.2790***		-0.8981		
	(-3.0423)		(-1.7067)		
$\Delta lnXVOL_t$	0.0784	0.1253*	0.0648		0.0403
	(1.0973)	(1.9253)	(0.6224)		(1.0290)
$\Delta lnXVOL_{t-1}$		0.0517	-0.2476**	-0.0646*	
		(0.8245)	(-2.4697)	(-2.0402)	
$\Delta lnXVOL_{t-2}$		0.0778			
		(1.2901)			
$\Delta lnCA_t$	0.2956***	0.1092**	0.3420**	0.4863***	
	(3.1830)	(2.1795)	(2.6390)	(3.7741)	
$\Delta lnCA_{t-1}$	-0.4551**	-0.1020*		-0.0886*	0.0955
	(-2.8044)	(-1.7916)		(-2.0426)	(1.6974)
$\Delta lnCA_{t-2}$	-0.2775**				
	(-2.2608)				
$\Delta lnDEBT_t$			-1.0426	-0.1097	
			(-1.5846)	(-1.2318)	
$\Delta lnDEBT_{t-1}$	0.3230	0.3005	1.3289*		-0.3516
	(0.9458)	(1.3821)	(1.9200)		(-1.6553)
$\Delta lnDEBT_{t-2}$	0.8284				-0.6572**
	(1.5786)				(-2.8988)

Note: ***, **, and * indicate significant at 1%, 5%, 10% levels, respectively. lnR is the ratio of international reserves to GDP, logged; lnYCAP is real GDP per capita, logged; lnPIM is average propensity to import (imports/GDP), logged; lnXVOL is volatility of real export receipts, logged; lnCA is the ratio of current account balance to GDP, logged; and lnDEBT is the ratio of total external debt to GDP, logged. Figures in parentheses ( ) are t-statistics.

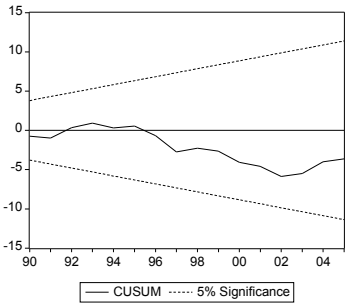
Table A2. Stability tests

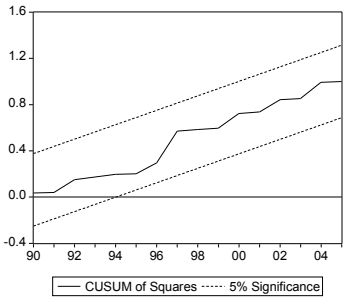
Indonesia



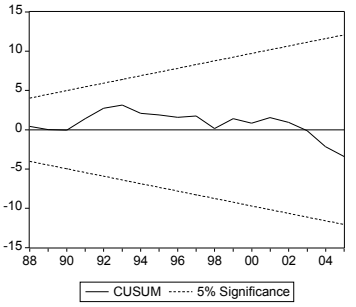


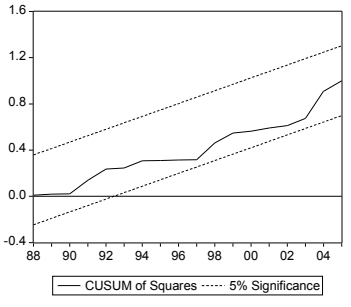
Malaysia



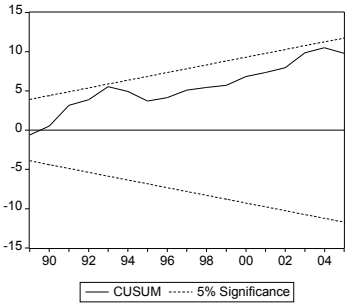


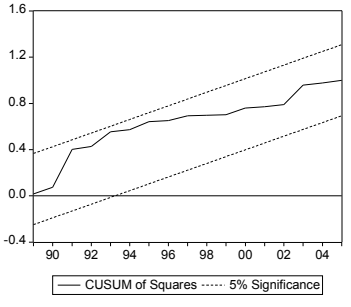
The Philippines





Singapore





Thailand