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THE OPTIMAL EXCHANGE RATE SYSTEM IN A MODEL OF TWO COUNTRIES WITH THE REST OF THE WORLD —A COMPARATIVE ANALYSIS OF THE FIXED EXCHANGE RATE, BASKET-PEG AND FLEXIBLE EXCHANGE RATE REGIMES—

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Abstract: The topic of this paper is the optimal exchange rate regime for small open economies, which are mutually dependent. Our most important finding is that, contrary to suggestions made by some economists, when such countries adopt basket-peg regimes, pegging against a common basket currency is not optimal. The optimal weights in the currency basket are different, because the structure of the goods and money markets are different. We have three other findings. One is that adopting a dollar-peg regime is not optimal in East Asia. Second, a floating exchange rate regime is one of the ways to minimize the loss, provided the optimal monetary policy is adopted. Third, the optimal weights in the basket depend on whether the foreign country also adopts a basket peg regime. This means that the optimal weight of the basket is different under the case where both Malaysia and Thailand adopt basket-peg regimes and under the case where only Malaysia adopts a basket-peg regime.

Key words: Optimal Exchange Rate System, Basket Peg, Optimal Weights of the Basket Peg, East Asian Currency System, Malaysia and Thailand.

JEL Classification Number:

1. INTRODUCTION

One of the factors behind the 1997–98 Asian financial crisis was the adoption of a de

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facto dollar-peg by many countries in East Asia[1]. Another factor was the discrepancy in maturity of lending and borrowing: the financial sectors in East Asian economies borrowed short-term from abroad but lent long-term to domestic firms. Due to these two reasons, economies were made vulnerable to crisis.

Concerning exchange rate regimes, McKinnon and Schnabl (2004) advocate the adoption of a dollar-peg regime in East Asia. They explained that by adopting the dollar-peg, developing countries with incomplete domestic financial markets can mitigate short-term domestic payment risk on the one hand, while providing a useful nominal anchor for national monetary policies on the other.

At the same time, Ito, Ogawa, Sasaki (1998), Ogawa and Ito (2002), Kawai (2002), Ito and Park (2004), Yoshino, Kaji and Suzuki (2004) point out the desirability of basket peg regimes in East Asia. They argue that for countries with close economic relationships with the United States, Japan and the European Union, exchange rate stabilization vis-à-vis a basket comprising these currencies was beneficial, because it removed the problem of large fluctuations of exchange rates.

Focusing on the basket peg regimes in East Asia, Ogawa and Ito (2002), Kawai (2002), and Ito and Park (2004) advocate G-3 (dollar, yen and euro) currency basket regimes. They also stated that weights of the basket should be the same for all East Asian countries, with an eye to introducing a common currency in the future. In other words, they advocate a "common basket regime" in East Asia.

There are two objectives in this paper; one is to find out which exchange rate regime is optimal in East Asia, the other is to see if the optimal weights in the basket are the same, if a basket-peg is to be adopted. We use a two-country general equilibrium model with a Rest of the World (R.O.W.)[2]. We compare four cases; (A) both Malaysia and Thailand adopt basket-peg regimes, (B) only Malaysia adopts basket-peg regime and Thailand adopts floating, (C) both Malaysia and Thailand adopt floating regimes, (D) Malaysia adopts a dollar-peg regime and Thailand adopts a floating regime.

The following are the four major findings of the paper. First, adopting a dollar-peg regime is not optimal in East Asia. Second, floating exchange rate with optimal monetary policy is one of the ways to minimize the loss function[3]. Third, adopting the basket-peg regime is one way to minimize the loss if each country adopts its own optimal weights. But it is not optimal for both countries to adopt a common basket for their currency. The optimal weights of the basket in the two countries are different because the structure of the goods and money markets are different in two countries. Fourth, the optimal weight of the basket depends on whether the foreign country also adopts a basket peg regime. In other words, the optimal weights in the basket are different under

[1] Ito, Ogawa and Sasaki (1998) and Ogawa and Ito (2000) both stress this point and advocate that the adoption of a basket-peg regime in East Asia, in order to avoid being negatively affected by fluctuations in the dollar-yen exchange rate.

[2] We assume Malaysia as home country, Thailand as foreign country, and US as the Rest of the World (R.O.W.).

[3] However as pointed out in Yoshino, Kaji, and Ibuka (2004), too much fluctuation of the exchange rate would hurt a small country where trade as a percentage of GDP is high.

the case where both Malaysia and Thailand adopt basket-peg regimes, and under the case where only Malaysia adopts a basket-peg regime.

Section 2 provides our macroeconomic model. Section 3 derives the reduced forms of the model under the assumptions of imperfect substitution and perfect substitution between Malaysian bonds and Thai bonds. Section 4 discusses how the effect of an exogenous shock depends on the degree of bond substitutability. The exogenous shock we consider is a change in foreign holdings of domestic currency denominated bonds. Section 5 shows the policy objectives and loss functions, which will be used to judge the optimality of the different exchange rate regimes. Sections 6 and 7 contain the empirical results. Section 6 derives the optimal weights in the exchange rates in the currency basket, if the monetary authority uses the basket weights as policy tools. Section 7 shows the empirical estimation of our model, using data for Malaysia and Thailand. Lastly, section 8 concludes the discussion.

2. MACROECONOMIC MODEL

As in Yoshino, Kaji, Suzuki (2004). this model is a two-country general equilibrium model comprised of five markets for each country; ① domestic money, ② domestic bonds, ③ assets denominated in dollars, ④ goods and services, ⑤ aggregate supply. There are three sectors: ① the public sector, and ② the private sector, and ③ the foreign sector. Therefore, there are totally 10 markets. There are also three countries: Malaysia (Home), Thailand (Foreign) and the USA (Rest of the World). We assume that Malaysia and Thailand are small countries and the USA is the rest of the world. The relationship between the baths-ringgit rate, the ringgit-dollar rate and the bahts-dollar rate is given by the identity.

$$\text{bahts per dollar} = \text{bahts per ringgit} \times \text{ringgit per dollar}$$

Or, using our notation given in Table of notations,

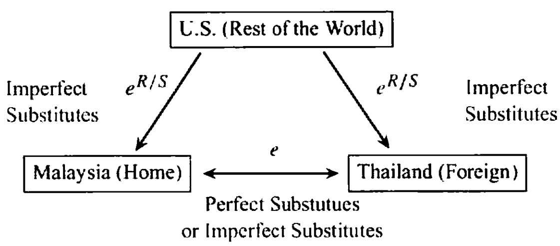

Table of notations

1.	r :	rate of interest on domestic assets of Malaysia
2.	r^* :	rate of interest on domestic assets of Thailand
3.	$r_{R.O.W.}$:	rate of interest on dollar-denominated assets
4.	$e^{eR/\$}$:	expected ringgit-dollar exchange rate
5.	$e^{R/\$}$:	ringgit-dollar exchange rate
6.	$e^{eB/\$}$:	expected bahts-dollar exchange rate
7.	$e^{B/\$}$:	bahts-dollar exchange rate
8.	$e^{eB/\$}$:	expected baths-ringgit exchange rate
9.	$e^{B/\$}$:	baths-ringgit exchange rate
10.	$\Delta e^{R/\$}$:	exchange risk from holding dollar denominated assets
11.	$\Delta e^{B/\$}$:	exchange risk from holding dollar denominated assets
12.	$\Delta e^{B/R}$:	exchange risk from holding bahts denominated assests
13.	w :	real value of domestic stock of assets of Malaysia
14.	w^* :	real value of domestic stock of assets of Thailand
15.	b_{MC} :	real stock of Malaysian government bonds held by the Malaysian Central Bank
16.	b_{TC} :	real stock of Thai government bonds held by the Malaysian Central Bank
17.	b_g :	real stock of Malaysian government bonds supplied
18.	b_g^* :	real stock of Thai government bonds supplied
19.	$b_g^{R.O.W.}$:	real stock of Malaysian government bonds held by R.O.W. residents
20.	$b_g^{*R.O.W.}$:	real stock of Malaysian government bonds held by R.O.W. residents
21.	$F_{MP}^{\$}$:	real stock of dollar denominated assets held by the private sector in Malaysia
22.	$F_{MC}^{\$}$:	real stock of dollar denominated assets held by the Malaysian Central Bank
23.	$F_M^{\$}$:	real stock of dollar denominated assets in Malaysia
24.	$F_{TP}^{\$}$:	real stock of dollar denominated assets held by the private sector in Thailand
25.	$F_{TC}^{\$}$:	real stock of dollar denominated assets held by the Thailand Central Bank
26.	$F_T^{\$}$:	real stock of dollar denominated assets in Thailand
27.	m :	stock of money supplied in Malaysia
28.	m^* :	stock of money supplied in Thailand
29.	g :	government spending in Malaysia
30.	g^* :	government spending in Thailand
31.	y :	GDP of Malaysia
32.	y^* :	GDP of Thailand
33.	$t^{R.O.W.}$:	GDP of R.O.W.
34.	p :	price of good produced in Malaysia
35.	p^* :	price of good produced in Thailand
36.	$p^{R.O.W.}$:	price of good produced in US

Except for the interest rates, all variables are natural logarithm values of the originals. All partial derivatives are defined to be positive. We assume Malaysia as the home country and Thailand as the foreign country.

We consider the following two cases; (1) Imperfect capital substitution between the Malaysian bonds and Thai bonds and (2) Perfect capital substitution between the Malaysian bonds and Thai bonds.

We assume that Malaysian residents do not hold baht-denominated assets and Thailand residents do not hold ringgit-denominated assets. Because of these assumptions, there are three stock equilibrium conditions for the asset markets in each country.

Following are the equations in the model:

$$m - p = -\varepsilon_1 r + \varepsilon_3(r_{R.O.W.} + e^{eR/\$} - e^{R/\$}) + \varepsilon_4 y + \varepsilon_5 w \tag{1}$$

$$m^* - p^* = -\varepsilon_1^* r^* + \varepsilon_3^*(r_{R.O.W.} + e^{eB/\$} - e^{B/\$}) + \varepsilon_4^* y^* + \varepsilon_5^* w^* \tag{2}$$

$$\begin{aligned} b_g = b_g^{R.O.W.} + b_{MC} + \beta_1 r - \beta_3(r_{R.O.W.} + e^{eR/\$} - e^{R/\$}) \\ + \beta_4 y + \beta_5 w + \beta_7 \Delta e^{R/\$} \end{aligned} \tag{3}$$

$$\begin{aligned} b_g^* = b_g^{*R.O.W.} + b_{TC} + \beta_1^* r^* - \beta_3^*(r_{R.O.W.} + e^{eB/\$} - e^{B/\$}) \\ + \beta_4^* y^* + \beta_5^* w^* + \beta_7^* \Delta e^{B/\$} \end{aligned} \tag{4}$$

$$F_M^\$ = F_{MC}^\$ - \eta_1 r + \eta_3(r_{R.O.W.} + e^{eR/\$} - e^{R/\$}) + \eta_4 \Delta e^{R/\$} + \eta_5 y + \eta_6 w \tag{5}$$

$$F_T^\$ = F_{TC}^\$ - \eta_1^* r^* + \eta_3^*(r_{R.O.W.} + e^{eB/\$} - e^{B/\$}) + \eta_4^* \Delta e^{B/\$} + \eta_5^* y^* + \eta_6^* w^* \tag{6}$$

$$\begin{aligned} y = \gamma_1 y - \gamma_2 r + \gamma_3 g + \gamma_4(e^{B/R} + p^* - p) + \gamma_5 y^* - \gamma_6 y + \gamma_7 \Delta e^{B/R} \\ + \gamma_8(e^{R/\$} + p^{R.O.W.} - p) + \gamma_9 y^{R.O.W.} - \gamma_{10} y + \gamma_{11} \Delta e^{R/\$} \end{aligned} \tag{7}$$

$$\begin{aligned} y^* = \gamma_1^* y^* - \gamma_2^* r^* + \gamma_3^* g^* - \gamma_4^*(e^{B/R} + p^* - p) + \gamma_5^* y - \gamma_6^* y^* + \Delta e^{B/R} \\ + \gamma_8^*(e^{B/\$} + p^{R.O.W.} - p^*) + \gamma_9^* y^{R.O.W.} - \gamma_{10}^* y^* + \gamma_{11}^* \Delta e^{B/\$} \end{aligned} \tag{8}$$

$$\begin{aligned} y = h_1(e^{B/R} + p^* - p) + h_2(e^{R/\$} + p^{R.O.W.} - p) \\ - h_3 r + h_4 \Delta e^{B/R} + h_5 \Delta e^{R/\$} \end{aligned} \tag{9}$$

$$\begin{aligned} y^* = h_1^*(-e^{B/R} + p - p^*) + h_2^*(e^{R/\$} + p^{R.O.W.} - p^*) \\ - h_3^* r^* + h_4^* \Delta e^{B/R} + h_5^* \Delta e^{B/\$} \end{aligned} \tag{10}$$

$$w + w^* = h_P + h_P^* + b_P + b_P^* + e^{R/\$} + F_{MP}^\$ + e^{B/\$} + F_{TP}^\$ \tag{11}$$

$$m - p = b_{MC} + e^{R/\$} + F_{MC}^\$ \tag{12}$$

$$m^* - p^* = b_{TC} + e^{B/\$} + F_{TC}^\$ \tag{13}$$

$$e^{B/\$} = e^{B/R} + e^{R/\$} \tag{14}$$

Equations (1) and (2) are the equilibrium condition for domestic money in Malaysia and Thailand. Concerning equation (1), the left-hand side is the real value of the stock of money supplied in Malaysia (money supply). The right-hand side is the real value of money demand in Malaysia. Money demand depends on the domestic rate of interest, the rate of dollar denominated assets, GDP and real value of stock of assets.

Equation (2) is the same with equation (1): the left-hand side is the real value of the stock of money supplied in Thailand. The right-hand side is the real value of money demand in Thailand.

Equation (3) and (4) show the equilibrium condition for domestic bonds in Malaysia and Thailand. Concerning equation (3), the left-hand side is the real value of the stock of domestic bonds supplied by the Malaysian government. The right-hand side is the real value of the demand for domestic bonds. The first term on the right-hand side express the real value of the US residents holding the ringgit-denominated assets. Domestic demand for domestic bonds in Malaysia depends on its own return, rate of interest on dollar-denominated assets, GDP and the real value of stock of assets. The last term on the right-hand side show that demand for domestic bonds increase with the increase in foreign exchange risk.

Equation (4) is the same with equation (3): the left-hand side is the real value of the stock of domestic bonds supplied by the Thailand government. The right-hand side is the real value of the demand for domestic bonds.

Equation (5) and (6) are equilibrium condition for foreign (dollar-denominated) bonds in Malaysia and Thailand. For equation (5), the left-hand side is the real value of the stock of dollar-denominated bonds supplied. The right-hand side is the real value of demand for dollar-denominated bonds. This time, the demand comes from the private and public sectors at home. Domestic demand for dollar-denominated bonds depends on rate of return as well as the exchange risk on the dollar-denominated bonds, domestic rate of interest, GDP, and real value of stock of assets. The demand for dollar-denominated bonds declines with the increase in foreign exchange rate risk.

Equation (6) is the same with equation (5): the left-hand side is the real value of the stock of the dollar-denominated bonds supplied. The right-hand side is the real value of demand for dollar-denominated bonds.

Equation (7) and (8) are equilibrium conditions in the goods and services market for Malaysia and Thailand respectively. For equation (7), this is an IS equation for Malaysia. Consumption depends on GDP and investment depends on the interest rate. Moreover, net exports depend on the baht-ringgit, ringgit-dollar exchange rates, US GDP, Thailand GDP, domestic GDP, and exchange rate risk.

Equation (8) is the same with equation (7): this is an IS equation for Thailand.

Equation (9) and (10) are equilibrium conditions for the aggregate supply for Malaysia and Thailand respectively. For equation (9), this is AS equation for Malaysia.

Production capital depends on the interest rate. Production inputs depend on the baht-ringgit ringgit-dollar exchange rates, and exchange rate risks. Equation (10) is the same with equation (9): this is AS equation for Thailand.

Equation (11) expresses the Warlus's law of assets (Accounting Identity), which shows that the domestic private sector holds domestic money, domestic bonds, and dollar-denominated bonds. All the variables are denominated in real term.

Equation (12) and (13) are the balance sheet of the Central Bank of Malaysia and Thailand respectively. For equation (12), the Central Bank of Malaysia has domestivc bonds and foreign bonds for assets. Both sides of equations are denominated in the real term. Equation (13) is the same with equation (12): the Central Bank of Thailand holds domestic bonds and foreign bonds for assets.

Equation (14) shows the relationship among the ringgit-dollar, the ringgit-baht, and the baht-dollar exchange rates.

2.1. Imperfect Capital Substitution between Malaysian bonds and Thai bonds

Under (1) Imperfect capital substitution between the Malaysian bonds and Thailand bonds, we consider four cases;

(A) Both Malaysia and Thailand adopt the common basket-peg with different weights,
(B) Malaysia adopts the basket-peg regime and Thailand adopts the floating exchange rate regime.
(C) Both Malaysia and Thailand adopt the floating exchange rate regime.
(D) Malaysia adopts the dollar-peg regime and Thailand adopts the floating exchange rate regime

Table 1 summarizes the four cases.

〈Table 1: Exchange rate regime〉

		Thailand		
		Basket-peg	Floating	Fixed (dollar-peg)
Malaysia	Basket-peg	A	B	
	Floating		C	
	Fixed (dollar-peg)		D	(E)

2.1.A. Both Malaysia and Thailand adopt the common basket-peg with different weights

In this case, the Malaysian central bank intervenes in the foreign exchange market to influence the ringgit-dollar rate. The Thai central bank intervenes in the foreign exchange rate market to influence the baht-ringgit rate. The value of the following currency basket remains constant[4].

$$\frac{1}{2}(\upsilon_1+\upsilon_2)e^{B/R}+\frac{1}{2}(1-\upsilon_1)e^{R/\$}+\frac{1}{2}(1-\upsilon_2)e^{B/\$}=\beta \quad (\beta \text{ is constant}) \qquad (15A)$$

υ_1 is the basket weight which the Central Bank of Malaysia has control over[5]. υ_2 is the basket weight which the Central Bank of Thailand has control over. β is the constant value of the basket.

We have equation (1) to (14) and equation (15A). We have 13 independent equations since we can omit equation (2) due to the Walras' Law (Accounting Identity). (Equation (11) is not the equilibrium equation). Independent equations are (1), (3), (4), (5), (6), (7), (8), (9), (10), (12), (13), (14), (15A). We have 13 endogenous variables: y, y^*, r, r^*, $F^{\$}_{MC}$, $F^{\$}_{TC}$, m, m^*, $e^{B/R}$, $e^{R/\$}$, $e^{B/\$}$, p, p^*.

2.1.B. Malaysia adopts the basket-peg regime and Thailand adopts the floating exchange rate regime[6]

Equations (1) to (14) remain the same as in 2.1.A. Since only Malaysia adopts basket-peg regime, the equation (15A) will turn into (15B) as follows.

$$\mu e^{B/R}+(1-\mu)e^{S/R}=\alpha^{7} \qquad (15B)$$

μ is the basket weight which the Central Bank of Malaysia has control over. α is the constant value of the basket.

We have 13 independent equations such as (1), (3), (4), (5), (6), (7), (8), (9), (10), (12), (13), (14), (15B). 13 endogenous variables are y, y^*, r, r^*, F^{S}_{MC}, F^{S}_{TC}, m, m^*, $e^{B/R}$, $e^{R/\$}$, $e^{B/S}$, p, p^*.

2.1.C. Both countries adopt the floating exchange rate regime

Equations (1) to (14) remain the same as in 2.1.A., the equation (15) is irrelevant in this case because there is no basket.

[4] We have received comments concerning this basket equation, mentioning that we should have two independent basket equations for two countries. If we assume that two countries have independent basket equations, using the equation (13), the three exchange rates will be determined in three equations. Therefore, the model will be dichotomized. In order to avoid the model being dichotomized, we assume that two countries intervene into foreign exchange rate market to maintain this single basket equation.

[5] The weights in equation (15A) add up to 1 without any constraints on υ_1 or υ_2. If the optimal value of weights turn out to be both 0 ($\upsilon_1=\upsilon_2=0$), then equation (15) turns into a two-exchange rate basket ($\frac{1}{2}e^{R/\$}+\frac{1}{2}e^{B/\$}=\beta$). In a similar manner, when the optimal value of weights are both 1 ($\upsilon_1=\upsilon_2=1$), then equation (15) turns into a single exchange rate basket, or fixing the baht-ringgit rate ($\frac{1}{2}e^{B/R}=\beta$).

[6] When one country (in this case, Malaysia) adopts the basket-peg, the partner country (in this case, Thailand) can not adopt fixed exchange rates. This is because the basket equation (15) and the exchange rate triangle equation (14) can not be maintained at the same time in such a case. If the baht-dollar rate is fixed, the equation (14) dictates that if the baht depreciate against the ringgit, then the ringgit must appreciate against the US dollar. At the same time, if the baht-dollar rate is fixed, the equation (15) dictates that when the baht depreciates against the ringgit, the dollar must appreciate against the ringgit.

[7] The weights in equation (15B) add up to 1 without any constraints on μ.

We have 12 independent equations such as (1), (3), (4), (5), (6), (7), (8), (9), (10), (12), (13), (14). 12 endogenous variables are y, y^*, r, r^*, b_{MC}, b_{TC}, $e^{B/R}$, $e^{R/\$}$, $e^{B/\$}$, $F^{\$}_{TC}$, p, p^*.

2.1.D. Malaysia adopts the dollar-peg regime and Thailand adopts the floating exchange rate regime

Equations (1), (2), (4) and (7) to (14) remain the same as in 2.1.A. We assume that when the Malaysian government fixes the ringgit against the US dollar, US dollar-denominated bonds and ringgit-denominated bonds become perfect substitutes. Therefore, equation (3), (5) and (6) can be combined to form equation (3D).

$$\begin{aligned} b_g + e^{R/\$} + F^{\$}_M + e^{B/\$} + F^{\$}_T = b_g^{R.O.W.} &+ b_{MC} + \beta_1 r - \beta_3(r_{R.O.W.} + e^{eR/\$} - e^{R/\$}) \\ &+ \beta_4 y + \beta_5 w + \beta_7 \Delta e^{R/\$} + e^{R/\$} + F^{\$}_{MC} - \eta_1 r \\ &+ \eta_3(r_{R.O.W.} + e^{eR/\$} - e^{R/\$}) + \eta_4 \Delta e^{R/\$} + \eta_5 y \\ &+ \eta_6 w + e^{B/\$} + F^{\$}_{TC} - \eta_1^* r \\ &+ \eta_3^*(r_{R.O.W.} + e^{eB/\$} - e^{B/\$}) + \eta_4^* \Delta e^{B/\$} \\ &+ \eta_5^* y^* + \eta_6^* w^* \end{aligned} \quad (3D)$$

The interest rate parity condition holds between the ringgit-denominated bonds and US dollar-denominated bonds.

$$r = r_{R.O.W.} + e^{eR/\$} - e^{R/\$} \quad (5D)$$

We have 11 independent equations such as (1), (3D), (4), (5D), (7), (8), (9), (10), (12), (13), (14). 11 endogenous variables are y, y^*, r, r^*, $F^{\$}_{MC}$, m, b_{TC}, $e^{B/R}$, $e^{B/\$}$, p, p^*.

2.2. Perfect capital substitution between Malaysian bonds and Thai bonds

Under perfect capital substitution between Malaysian bonds and Thai bonds, we consider five cases;

(A) Both Malaysia and Thailand adopt the common basket-peg with different weights,
(B) Malaysia adopts the basket-peg regime and Thailand adopts the floating exchange rate regime.
(C) Both Malaysia and Thailand adopt the floating exchange rate regime,
(D) Malaysia adopts the dollar-peg regime and Thailand adopts the floating exchange rate regime
(E) Both Malaysia and Thailand adopt the dollar-peg regime[8]

[8] Only under perfect capital substitution between Malaysian bonds and Thai bonds, it is possible that both countries adopt the dollar-peg. Under imperfect capital substitution between the two bonds, it is impossible that both countries the adopt dollar-peg. As explained below when we discuss case (E).

The five cases are summarized in Table 1 above.

2.2.A. Both Malaysia and Thailand adopt the common basket-peg with different weights

Equations (1) to (2) and (5) to (15A) remain the same as in the imperfect capital substation. In the case of perfect substitution, Malaysian bonds and Thai bonds can be considered as common bonds. We assume that the Malaysian government and Thai government issue the common bonds. Therefore, equations (3) and (4) are combined to form one equation as follows.

$$\begin{aligned} b_g + e^{B/R} + b_g^* = {} & b_g^{R.O.W.} + e^{B/R} + b_g^{*R.O.W.} + b_{MC} + b_{TC} + \beta_1 r \\ & + \beta_1^* r^* - \beta_3(r_{R.O.W.} + e^{eR/\$} - e^{R/\$}) \\ & - \beta_3^*(r_{R.O.W.} + e^{eR/\$} - e^{R/\$}) + \beta_4 y + \beta_4^* y^* + \beta_4 w + \beta_5^* w^* \\ & + \beta_7 \Delta e^{R/\$} + \beta_7^* \Delta e^{B/\$} \end{aligned} \tag{3A}$$

The interest rate parity condition holds between the Malaysian bonds and Thai bonds.

$$r^* = r + e^{eB/R} - e^{B/R} \tag{4A}$$

We have 13 independent equations such as (1), (3A), (4A), (5), (6), (7), (8), (9), (10), (12), (13), (14), (15A). 13 endogenous variables are y, y^*, r, r^*, $F_{MC}^{\$}$, $F_{TC}^{\$}$, m, m^*, $e^{B/R}$, $e^{R/\$}$, $e^{B/\$}$, p, p^*.

2.2.B. Malaysia adopts the basket-peg regime and Thailand adopts the floating exchange rate regime

Equations (1) to (14) remain the same as in 2.2.A. Since only Malaysia adopts basket-peg regime, the equation (15A) will turn into (15B) as follows.

$$\mu e^{B/R} + (1-\mu)e^{\$/R} = \alpha \tag{15B}$$

μ is the basket weight which the Central Bank of Malaysia has control over. α is the constant value of the basket.

We have independent equations such as (1), (3A), (4A), (5), (6), (7), (8), (9), (10), (12), (13), (14), and (15B). 13 endogenous variables are y, y^*, r, r^*, $F_{MC}^{\$}$, $F_{TC}^{\$}$, m, m^*, $e^{B/R}$, $e^{R/\$}$, $e^{B/\$}$, p, p^*.

2.2.C. Both Malaysia and Thailand adopt the floating exchange rate regime

Equations (1) to (14) remain the same as in 2.2.C. The equation (15) is irrelevant in this case because there is no basket.

We have 12 independent equations such as (1), (3A), (4A), (5), (6), (7), (8), (9), (10), (12), (13), and, (14). 12 endogenous variables are y, y^*, r, r^*, b_{MC}, b_{TC}, $e^{B/R}$, $e^{R/\$}$, $e^{B/\$}$, $F_{TC}^{\$}$, p, p^*.

2.2.D. Malaysia adopts the dollar-peg regime and Thailand adopts the floating exchange rate regime

In the case of the dollar-peg regime (Malaysia fixed against US dollar) and perfect capital substitution, ringgit-denominated bonds, baht-denominated bonds and US dollar-denominated are all perfect substitutes. Therefore, equation (3), (4), (5), and (6) are combined to form one single equilibrium equation such as (3D).

$$\begin{aligned} b_g + b_g^* + e^{R/\$} + F_M^\$ + e^{B/\$} + F_T^\$ = b_g^{R.O.W.} &+ b_{MC} + \beta_1 r \\ &- \beta_3(r_{R.O.W.} + e^{eR/\$} - e^{R/\$}) + \beta_4 y \\ &+ \beta_5 w + \beta_7 \Delta e^{R/\$} + b_g^{*R.O.W.} + b_{TC} \\ &+ \beta_1^* r^* - \beta_3^*(r_{R.O.W.} + e^{eB/\$} - e^{B/\$}) \\ &+ \beta_4^* y^* + \beta_5^* w^* + \beta_7^* \Delta e^{B/\$} + e^{R/\$} + F_{MC}^\$ \\ &- \eta_1 r + \eta_3(r_{R.O.W.} + e^{eR/\$} - e^{R/\$}) \\ &+ \eta_4 \Delta e^{R/\$} + \eta_5 y + \eta_6 w + e^{B/\$} + F_{TC}^\$ \\ &- \eta_1^* r^* + \eta_3^*(r_{R.O.W.} + e^{eB/\$} - e^{B/\$}) \\ &+ \eta_4^* \Delta e^{B/\$} + \eta_5^* y^* + \eta_6^* w^* \qquad (3D) \end{aligned}$$

The interest rate parity condition holds between the ringgit-denominated bonds and the baht-denominated bonds.

$$r^* = r + e^{eB/R} - e^{B/R} \qquad (4A)$$

The interest rate parity condition holds between the ringgit-denominated bonds and US dollar-denominated bonds.

$$r = r_{R.O.W.} + e^{eR/\$} - e^{R/\$} \qquad (5D)$$

The interest rate parity condition holds between the baht-denominated bonds and US dollar-denominated bonds.

$$r^* = r_{R.O.W.} + e^{eB/\$} - e^{B/\$} \qquad (6D)$$

Only two out of three interest parity conditions (4A), (5D), and (6D) are independent since the exchange rate triangle equation (14) is maintained at the same time.

We have 11 independent equations such as (1), (3D), (4A), (5D), (7), (8), (9), (10), (12), (13), (14). 11 endogenous variables are y, y^*, r, r^*, $F_{MC}^\$$, m, b_{TC}, $e^{B/R}$, $e^{B/\$}$, p, p^*.

2.2.E. Both Malaysia and Thailand adopt the dollar-peg regime[9]

[9] Assume that both countries adopt dollar-peg under imperfect capital substitution between Malaysian bonds and Thai bonds. We assumed that there are no risk premia and the dollar-peg means perfect substitution with dollar denominated bonds. If both countries adopt dollar-peg, on the one hand, the Malaysian bonds and U.S. bonds are perfect substitute, but on the other hand, Thai bonds and U.S. bonds are perfect substitute. Therefore, due to the equation (14), the Malaysian bonds and Thai bonds are perfect substitutes.

Equations (1), (2) and (7) to (14) remain the same. As in 2.2.B. in the perfect capital substitution between Malaysian bonds and Thai bonds, we have equation (3C), (5A) and (6A) instead of equation (3), (4), (5), and (6) since the all Malaysian bonds, Thai bonds and U.S bonds are perfect substitutes.

We have 11 independent equations such as (1), (3D), (4A), (5D), (7), (8), (9), (10), (12), (13), (14). 11 endogenous variables are y, y^*, r, r^*, $F^{\$}_{MC}$, $F^{\$}_{TC}$, m, m^*, $e^{B/\$}$, p p^*.

3.

3.1. *Reduced forms when Malaysian and Thai bonds are imperfect substitutes*

We derive the reduced forms for the four cases summarized in Table 1.

3.1.A. *Malaysia and Thailand individually adopt basket-peg regimes*

By substituting equation (14) in (15A), we obtain,

$$(e^{B/R} - \bar{e}^{B/R}) = \frac{(\upsilon_1 + \upsilon_2 - 2)}{(1 + \upsilon_1)}(e^{R/\$} - \bar{e}^{R/\$}) \qquad (16)$$

Equation (16) shows that, if β is kept constant, the baht-ringgit rate has a one-to-one relationship with the ringgit-dollar rate. In other words, the baht-ringgit rate can be expressed by the ringgit-dollar rate. This equation shows that the baths-ringgit and ringgit-dollar rates always change in opposite directions if β is kept constant. The baht-ringgit rate is endogenous, but determined by solely by what happened to the ringgit-dollar rate.

The central bank of Malaysia and the central bank of Thailand must intervene in the foreign exchange market to move the baht-dollar and ringgit-dollar rates in just such a way that β remains constant. Clearly, adopting a basket-peg does not free the central bank from the burden of intervention. Both the stock of foreign reserves of Malaysia and the stock of foreign reserves of Thailand are endogenous variables.

Independent equations are (1), (3), (4), (5), (6), (7), (8), (9), (10), (12), (13), (14), (15). We have 13 endogenous variables: y, y^*, r, r^*, $F^{\$}_{MC}$, $F^{\$}_{TC}$, m, m^*, $e^{B/R}$, $e^{R/\$}$, $e^{B/\$}$, p, p^*. In this case, $e^{B/R}$ is determined by the equation (15) and $e^{R/\$}$ is determined by equation (14). The reduced form is

$$\begin{bmatrix} Y_y & Y_{y^*} & Y_r & 0 & \{Y_{e^{B/R}}(\upsilon_1+\upsilon_2-2)+Y_{e^{R/\$}}(1-\upsilon_1)\} & 0 & 0 & Y_p & Y_{p^*} \\ Y^*_y & Y^*_{y^*} & 0 & Y^*_{r^*} & \{Y^*_{e^{B/R}}(\upsilon_1+\upsilon_2-2)+Y^*_{e^{R/\$}}(1+\upsilon_1)\} & 0 & 0 & Y^*_p & Y^*_{p^*} \\ B_y & 0 & B_r & 0 & \{B_{e^{R/\$}}(1+\upsilon_1)\} & 0 & 0 & 0 & 0 \\ 0 & B^*_{y^*} & 0 & B^*_{r^*} & \{B^*_{e^{B/R}}(\upsilon_1+\upsilon_2-2)+B^*_{e^{R/\$}}(1+\upsilon_1)\} & 0 & 0 & 0 & 0 \\ F_y & 0 & F_r & 0 & \{F_{e^{R/\$}}(1+\upsilon_1)\} & 1 & 0 & 0 & 0 \\ 0 & F^*_{y^*} & 0 & F^*_{r^*} & \{F^*_{e^{B/R}}(\upsilon_1+\upsilon_2-2)+F^*_{e^{R/\$}}(1+\upsilon_1)\} & 0 & 1 & 0 & 0 \\ M_y & 0 & M_r & 0 & \{M_{e^{R/\$}}(1+\upsilon_1)\} & 0 & 0 & 1 & 0 \\ 1 & 0 & S_r & 0 & \{S_{e^{B/R}}(\upsilon_1+\upsilon_2-2)+S_{e^{R/\$}}(1+\upsilon_1)\} & 0 & 0 & S_p & S_{p^*} \\ 0 & 1 & 0 & S^*_{r^*} & \{S^*_{e^{B/R}}(\upsilon_1+\upsilon_2-2)+S^*_{e^{R/\$}}(1+\upsilon_1)\} & 0 & 0 & S^*_p & S^*_{p^*} \end{bmatrix} \begin{bmatrix} (y-\bar{y}) \\ (y^*-\bar{y}^*) \\ (r-\bar{r}) \\ (r^*-\bar{r}^*) \\ (e^{R/\$}-\bar{e}^{R/\$}) \\ (F^{\$}_{MC}-\bar{F}^{\$}_{MC}) \\ (F^{\$}_{TC}-\bar{F}^{\$}_{TC}) \\ (p-\bar{p}) \\ (p^*-\bar{p}^*) \end{bmatrix}$$

$$
= \begin{bmatrix}
1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & Y_{\Delta e^{B/R}} & Y_{\Delta e^{R/\$}} & 0 & 0 \\
0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & Y^*_{\Delta e^{B/R}} & Y^*_{\Delta e^{R/\$}} & 0 & 0 \\
0 & 0 & 0 & B_{e^{eR/\$}} & 1 & 0 & -1 & 0 & 0 & B_{\Delta e^{R/\$}} & -1 & 0 \\
0 & 0 & B_{e^{eB/R}} & B^*_{e^{eR/\$}} & 0 & 1 & 0 & -1 & B^*_{\Delta e^{B/R}} & B^*_{\Delta e^{R/\$}} & 0 & -1 \\
0 & 0 & 0 & F_{e^{R/\$}} & 0 & 0 & 0 & 0 & 0 & F_{\Delta e^{R/\$}} & 0 & 0 \\
0 & 0 & F^*_{e^{eB/R}} & F^*_{e^{eR/\$}} & 0 & 0 & 0 & 0 & F^*_{\Delta e^{B/R}} & F^*_{\Delta e^{R/\$}} & 0 & 0 \\
0 & 0 & 0 & M_{e^{eR/\$}} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & S_{\Delta e^{R/\$}} & S_{\Delta e^{R/\$}} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & S^*_{\Delta e^{R/\$}} & S^*_{\Delta e^{R/\$}} & 0 & 0
\end{bmatrix}
\begin{bmatrix}
(g - \bar{g}) \\
(g^* - \bar{g}^*) \\
(e^{eB/R} - \bar{e}^{eB/R} \\
(e^{eR/\$} - \bar{e}^{eR/\$}) \\
(b_g - \bar{b}_g) \\
(b^*_g - \bar{b}^*_g) \\
(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) \\
(b_g^{*R.O.W.} - \bar{b}_g^{*R.O.W.}) \\
(\Delta e^{B/R} - \Delta \bar{e}^{B/R}) \\
(\Delta e^{R/\$} - \Delta \bar{e}^{B/R}) \\
(b_{MC} - \bar{b}_{MC}) \\
(b_{TC} - \bar{b}_{TC})
\end{bmatrix}
\tag{17}
$$

3.1.B. Malaysia adopts the basket-peg and Thailand adopts the floating exchange rate regime

We have 13 independent equations such as (1), (3), (4), (5), (6), (7), (8), (9), (10), (12), (13), (14), (15B). 13 endogenous variables are y, y^*, r, r^*, $F^{\$}_{MC}$, $F^{\$}_{TC}$, m, m^*, $e^{B/R}$, $e^{R/\$}$, $e^{B/\$}$, p, p^*.

In this case, $e^{B/R}$ is determined by the equation (15B) and $e^{R/\$}$ is determined by equation (14). The reduced form is

$$
\begin{bmatrix}
Y_y & Y_{y^*} & Y_r & 0 & \{Y_{e^{B/R}}(v_1 - 1) + Y_{e^{R/\$}} v_1\} & 0 & 0 & Y_p & Y_{p^*} \\
Y^*_y & Y^*_{y^*} & 0 & Y^*_{r^*} & \{Y^*_{e^{B/R}}(v_1 - 1) + Y^*_{e^{R/\$}} v_1\} & 0 & 0 & Y_{p^*} & Y^*_{p^*} \\
B_y & 0 & B_r & 0 & \{B_{e^{R/\$}} v_1\} & 0 & 0 & 0 & 0 \\
0 & B^*_{y^*} & 0 & B^*_{r^*} & \{B^*_{e^{B/R}}(v_1 - 1) + B^*_{e^{R/\$}} v_1\} & 0 & 0 & 0 & 0 \\
F_y & 0 & F_r & 0 & \{F_{e^{R/\$}} v_1\} & 1 & 0 & 0 & 0 \\
0 & F^*_{y^*} & 0 & F^*_{r^*} & \{F^*_{e^{B/R}}(v_1 - 1) + F^*_{e^{R/\$}} v_1\} & 0 & 1 & 0 & 0 \\
M_y & 0 & M_r & 0 & \{M_{e^{R/\$}} v_1\} & 0 & 0 & 1 & 0 \\
1 & 0 & S_r & 0 & \{S_{e^{B/R}}(v_1 - 1 + S_{e^{R/\$}} v_1\} & 0 & 0 & S_p & S_{p^*} \\
0 & 1 & 0 & S^*_{r^*} & \{S^*_{e^{B/R}}(v_1 - 1 + S^*_{e^{R/\$}} v_1\} & 0 & 0 & S^*_p & S^*_{p^*}
\end{bmatrix}
\begin{bmatrix}
(y - \bar{y}) \\
(y^* - \bar{y}^*) \\
(r - \bar{r}) \\
(r^* - \bar{r}^*) \\
(e^{R/\$} - \bar{e}^{R/\$}) \\
(F^{\$}_{MS} - \bar{F}^{\$}_{MC}) \\
(F^{\$}_{TC} - \bar{F}^{\$}_{TC}) \\
(p - \bar{p}) \\
(p^* - \bar{p}^*)
\end{bmatrix}
$$

$$= \begin{bmatrix} 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & Y_{\Delta e^{B/R}} & Y_{\Delta e^{R/\$}} & 0 \\ 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & Y^*_{\Delta e^{B/R}} & Y^*_{\Delta e^{R/\$}} & 0 \\ 0 & 0 & 0 & B_{e^{eR/\$}} & 1 & 0 & -1 & 0 & 0 & B_{\Delta e^{R/\$}} & -1 \\ 0 & 0 & B^*_{e^{B/R}} & B_{e^{eR/\$}} & 0 & 1 & 0 & -1 & B^*_{\Delta e^{R/\$}} & B^*_{\Delta e^{R/\$}} & 0 \\ 0 & 0 & 0 & F_{e^{eR/\$}} & 0 & 0 & 0 & 0 & 0 & F_{\Delta e^{R/\$}} & 0 \\ 0 & 0 & F^*_{e^{B/R}} & F^*_{e^{eR/\$}} & 0 & 0 & 0 & 0 & F^*_{\Delta e^{B/R}} & F^*_{\Delta e^{R/\$}} & 0 \\ 0 & 0 & 0 & M_{e^{eR/\$}} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & S_{\Delta e^{B/R}} & S_{\Delta e^{R/\$}} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & S^*_{\Delta e^{B/R}} & S^*_{\Delta e^{R/\$}} & 0 \end{bmatrix} \begin{bmatrix} (g - \bar{g}) \\ (g^* - \bar{g}^*) \\ (e^{eB/R} - \bar{e}^{eB/R}) \\ (e^{eR/\$} - \bar{e}^{eR/\$}) \\ (b_g - \bar{b}_g) \\ (b^*_g - \bar{b}^*_g) \\ (b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) \\ (b_g^{*R.O.W.} - b_g^{*R.O.W.}) \\ (\Delta e^{B/R} - \Delta\bar{e}^{B/R}) \\ (\Delta e^{R/\$} - \Delta\bar{e}^{R/\$}) \\ (b_{MC} - \bar{b}_{MC}) \end{bmatrix} \tag{18}$$

3.1.C. Both Malaysia and Thailand adopt the floating exchange rate regime

We have 12 independent equations such as (1), (3), (4), (5), (6), (7), (8), (9), (10), (12), (13), (14). 12 endogenous variables are y, y^*, r, r^*, b_{MC}, b_{TC}, $e^{B/R}$, $e^{R/\$}$, $e^{B/\$}$, F^*_{TC}, p, p^*. In this case, m and m^* are both exogenous variable since both countries have monetary policy autonomy. $e^{B/R}$ is determined residually by equation (14). Equation (12) puts some constraints on $F^{\$}_{TC}$, so that it is endogenous variable[10]. The reduced forms are as follows.

$$\begin{bmatrix} Y_y & Y_{y^*} & Y_r & 0 & Y_{e^{B/R}} & Y_{e^{R/\$}} & 0 & 0 & 0 & Y_p & Y_{p^*} \\ Y^*_Y & Y^*_{y^*} & 0 & Y^*_{r^*} & Y^*_{e^{B/R}} & Y^*_{e^{R/\$}} & 0 & 0 & 0 & Y^*_p & Y^*_{p^*} \\ B_y & 0 & B_r & 0 & 0 & B_{e^{R/\$}} & 1 & 0 & 0 & 0 & 0 \\ 0 & B^*_{y^*} & 0 & B^*_{r^*} & B^*_{e^{B/R}} & B^*_{e^{R/\$}} & 0 & 0 & 1 & 0 & 0 \\ F_y & 0 & F_r & 0 & 0 & F_{e^{R/\$}} & 0 & 0 & 0 & 0 & 0 \\ 0 & F^*_{y^*} & 0 & F^*_{r^*} & F^*_{e^{B/R}} & F^*_{e^{R/\$}} & 0 & 1 & 0 & 0 & 0 \\ M_y & 0 & M_r & 0 & 0 & M_{e^{R/\$}} & 0 & 0 & 0 & 1 & 0 \\ -1 & 0 & S_r & 0 & S_{e^{B/R}} & S_{e^{R/\$}} & 0 & 0 & 0 & S_p & S_{p^*} \\ 0 & -1 & 0 & S^*_{R^*} & S^*_{e^{B/R}} & S^*_{e^{R/\$}} & 0 & 0 & 0 & S^*_p & S^*_{p^*} \\ 0 & 0 & 0 & 0 & 0 & 1 & 1 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 1 & 1 & 0 & 1 & 1 & 0 & 1 \end{bmatrix} \begin{bmatrix} (y - \bar{y}) \\ (y^* - \bar{y}^*) \\ (r - \bar{r}) \\ (r^* - \bar{r}^*) \\ (e^{B/R} - \bar{e}^{B/R}) \\ (e^{R/\$} - \bar{e}^{R/\$}) \\ (b_{MC} - \bar{b}_{MC}) \\ (F^{\$}_{TC} - \bar{F}^{\$}_{TC}) \\ (b_{TC} - \bar{b}_{TC}) \\ (p - \bar{p}) \\ (p^* - \bar{p}^*) \end{bmatrix} =$$

[10] Since this is two-country model, one of the two central banks has to intervene into the foreign exchange rate market to maintain equation (14).

$$\begin{bmatrix} 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & Y_{\Delta e^{B/R}} & Y_{\Delta e^{R/\$}} & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & Y^*_{\Delta e^{B/R}} & Y^*_{\Delta e^{R/\$}} & 0 & 0 & 0 \\ 0 & 0 & 0 & B_{e^{eR/\$}} & 1 & 0 & -1 & 0 & 0 & B_{\Delta e^{R/\$}} & 0 & 0 & 0 \\ 0 & 0 & B^*_{e^{eB/R}} & B^*_{e^{eR/\$}} & 0 & 1 & 0 & -1 & B^*_{\Delta e^{B/R}} & B^*_{\Delta e^{R/\$}} & 0 & 0 & 0 \\ 0 & 0 & 0 & F_{e^{eR/\$}} & 0 & 0 & 0 & 0 & 0 & F_{\Delta e^{R/\$}} & -1 & 0 & 0 \\ 0 & 0 & F^*_{e^{eB/R}} & F^*_{e^{eR/\$}} & 0 & 0 & 0 & 0 & F^*_{\Delta e^{B/R}} & F^*_{\Delta e^{R/\$}} & 0 & 0 & 0 \\ 0 & 0 & 0 & M_{e^{eR/\$}} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & S_{\Delta e^{B/R}} & S_{\Delta e^{R/\$}} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & S^*_{\Delta e^{B/R}} & S^*_{\Delta e^{R/\$}} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -1 & 1 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 \end{bmatrix} \begin{bmatrix} (g-\bar{g}) \\ (g^*-\bar{g}^*) \\ (e^{eB/R}-\bar{e}^{eB/R}) \\ (e^{eR/\$}-\bar{e}^{eR/\$}) \\ (b_g-\bar{b}_g) \\ (b^*_g-\bar{b}^*_g) \\ (b_g^{R.O.W.}-\bar{b}_g^{R.O.W.}) \\ (b_g^{*R.O.W.}-\bar{b}_g^{*R.O.W.}) \\ (\Delta e^{B/R}-\Delta\bar{e}^{B/R}) \\ (\Delta e^{R/\$}-\Delta\bar{e}^{R/\$}) \\ (F^\$_{MC}-\bar{F}^\$_{MC}) \\ (m-\bar{m}) \\ (m^*-\bar{m}^*) \end{bmatrix} \tag{19}$$

3.1.D. *Malaysia adopts the dollar-peg and Thailand adopts the floating exchange rate regime*

We have 11 independent equations such as (1), (3D), (4), (5D), (7), (8), (9), (10), (12), (13), (14). 11 endogenous variables are y, y^*, r, r^*, $F^\$_{MC}$, m, b_{TC}, $e^{B/R}$, $e^{B/\$}$, p, p^*.

In this case, $e^{B/\$}$ is determined residually by equation (14) and r is determined residually by equation (5A). The reduced forms are follows;

$$\begin{bmatrix} Y_y & Y_{y^*} & 0 & Y_{e^{B/R}} & 0 & 0 & 0 & Y_p & Y_{p^*} \\ Y^*_y & Y^*_{y^*} & Y^*_r & Y^*_{e^{B/R}} & 0 & 0 & 0 & Y_{p^*} & Y^*_{p^*} \\ B_y & B_{y^*} & B_{r^*} & B_{e^{B/R}} & 0 & 1 & 0 & 0 & 0 \\ 0 & B^*_{y^*} & B^*_{r^*} & B^*_{e^{B/R}} & 1 & 0 & 0 & 0 & 0 \\ M_y & 0 & 0 & 0 & 0 & 0 & -1 & 1 & 0 \\ -1 & 0 & 0 & S_{e^{B/R}} & 0 & 0 & 0 & S_p & S_{p^*} \\ 0 & -1 & S^*_{r^*} & S^*_{e^{B/R}} & 0 & 0 & 0 & S^*_p & S^*_{p^*} \\ 0 & 0 & 0 & 0 & 0 & 1 & -1 & 1 & 0 \\ 0 & 0 & 0 & 1 & 1 & 0 & 0 & 0 & 1 \end{bmatrix} \begin{bmatrix} (y-\bar{y}) \\ (y^*-\bar{y}^*) \\ (r^*-\bar{r}^*) \\ (e^{B/R}-\bar{e}^{B/R}) \\ (b_{TC}-\bar{b}_{TC}) \\ (F^\$_{MC}-\bar{F}^\$_{MC}) \\ (m-\bar{m}) \\ (p-\bar{p}) \\ (p^*-\bar{p}^*) \end{bmatrix} =$$

$$\begin{bmatrix} 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & Y_{\Delta e^{B/R}} & Y_{\Delta e^{R/\$}} & Y_{e^{R/\$}} & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & Y^*_{\Delta e^{B/R}} & Y^*_{\Delta e^{R/\$}} & Y^*_{e^{R/\$}} & 0 & 0 \\ 0 & 0 & B_{e^{e B/R}} & B_{e^{e R/\$}} & 1 & 0 & -1 & 0 & B_{\Delta e^{B/R}} & B_{\Delta e^{R/\$}} & B_{e^{R/\$}} & -1 & 0 \\ 0 & 0 & B^*_{e^{e B/R}} & B^*_{e^{e R/\$}} & 0 & 1 & 0 & -1 & B^*_{\Delta e^{B/R}} & B^*_{\Delta e^{R/\$}} & B^*_{e^{R/\$}} & 0 & 0 \\ 0 & 0 & 0 & M_{e^{e R/\$}} & 0 & 0 & 0 & 0 & 0 & 0 & M_{e^{R/\$}} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & S_{\Delta e^{B/R}} & S_{\Delta e^{R/\$}} & S_{e^{R/\$}} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & S^*_{\Delta e^{B/R}} & S^*_{\Delta e^{R/\$}} & S^*_{e^{R/\$}} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -1 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 \end{bmatrix} \begin{bmatrix} (g - \bar{g}) \\ (g^* - \bar{g}^*) \\ (e^{e B/R} - \bar{e}^{e B/R}) \\ (e^{e R/\$} - \bar{e}^{e R/\$}) \\ (b_g - \bar{b}_g) \\ (b^*_g - \bar{b}^*_g) \\ (b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) \\ (b_g^{*R.O.W.} - \bar{b}_g^{*R.O.W.}) \\ (\Delta e^{B/R} - \Delta\bar{e}^{B/R}) \\ (\Delta e^{R/\$} - \Delta\bar{e}^{R/\$}) \\ (e^{R/\$} - \bar{e}^{R/\$}) \\ (F^{\$}_{TC} - \bar{F}^{\$}_{TC}) \\ (m^* - \bar{m}^*) \end{bmatrix} \tag{20}$$

3.2. Reduced Forms when Malaysian and Thai bonds are perfect substitutes

We derive the reduced forms for the five cases summarized in Table 1.

3.2.A. Both Malaysia and Thailand individually adopt basket-peg regimes

We have 13 independent equations such as (1), (3A), (4A), (5), (6), (7), (8), (9), (10), (12), (13), (14), (15). 13 endogenous variables are y, y^*, r, r^*, $F^{\$}_{MC}$, $F^{\$}_{TC}$, m, m^*, $e^{B/R}$, $e^{R/\$}$, $e^{B/\$}$, p, p^*.

In this case, $e^{B/R}$is determined by the equation (15) and $e^{R/\$}$ is determined by equation (14). In addition to these, r^* is determined residually by equation (4A). The reduced forms are follows:

$$\begin{bmatrix} Y_y & Y^*_y & Y_r & \{Y_{e^{B/R}}(\upsilon_1 + \upsilon_2 - 2) + Y_{e^{R/\$}}(1 + \upsilon_1)\} & 0 & 0 & Y_p & Y_{p^*} \\ Y^*_y & Y^*_{y^*} & Y^*_r & \{Y^*_{e^{B/R}}(\upsilon_1 + \upsilon_2 - 2) + Y^*_{e^{R/\$}}(1 + \upsilon_1)\} & 0 & 0 & Y^*_p & Y^*_{p^*} \\ B_y & B_{y^*} & B_r & \{B_{e^{B/R}}(\upsilon_1 + \upsilon_2 - 2) + B_{e^{R/\$}}(1 + \upsilon_1)\} & 0 & 0 & 0 & 0 \\ F_y & 0 & F_r & \{F_{e^{R/\$}}(1 + \upsilon_1)\} & 1 & 0 & 0 & 0 \\ 0 & F^*_{y^*} & F^*_r & \{F^*_{e^{B/R}}(\upsilon_1 + \upsilon_2 - 2) + F^*_{e^{R/\$}}(1 + \upsilon_1)\} & 0 & 1 & 0 & 0 \\ M_y & 0 & M_r & \{M_{e^{R/\$}}(1 + \upsilon_1)\} & 0 & 0 & 1 & 0 \\ -1 & 0 & S_r & \{S_{e^{B/R}}(\upsilon_1 + \upsilon_2 - 2) + S_{e^{R/\$}}(1 + \upsilon_1)\} & 0 & 0 & S_p & S_{p^*} \\ 0 & -1 & S^*_r & \{S^*_{e^{B/R}}(\upsilon_1 + \upsilon_2 - 2) + S_{e^{R/\$}}(1 + \upsilon_1)\} & 0 & 0 & S^*_p & S^*_{p^*} \end{bmatrix} \begin{bmatrix} (y - \bar{y}) \\ (y^* - \bar{y}^*) \\ (r - \bar{r}) \\ (e^{R/\$} - \bar{e}^{R/\$}) \\ (F^{\$}_{MC} - \bar{F}^{\$}_{MC}) \\ (F^{\$}_{TC} - \bar{F}^{\$}_{TC}) \\ (p - \bar{p}) \\ (p^* - \bar{p}^*) \end{bmatrix}$$

$$
= \begin{bmatrix}
1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & Y_{\Delta e^{B/R}} & Y_{\Delta e^{R/\$}} & 0 & 0 \\
0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & Y^*_{\Delta e^{B/R}} & Y^*_{\Delta e^{R/\$}} & 0 & 0 \\
0 & 0 & 0 & B_{e^{eB/\$}} & 1 & 1 & -1 & -1 & 0 & B_{\Delta e^{R/\$}} & -1 & -1 \\
0 & 0 & 0 & F_{e^{eR/\$}} & 0 & 0 & 0 & 0 & 0 & F_{\Delta e^{R/\$}} & 0 & 0 \\
0 & 0 & F^*_{e^{eB/R}} & F^*_{e^{R/\$}} & 0 & 0 & 0 & 0 & F^*_{\Delta e^{B/R}} & F^*_{\Delta e^{R/\$}} & 0 & 0 \\
0 & 0 & 0 & M_{e^{eR/\$}} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & S_{\Delta e^{B/R}} & S_{\Delta e^{R/\$}} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & S^*_{\Delta e^{B/R}} & S^*_{\Delta e^{R/\$}} & 0 & 0
\end{bmatrix}
\begin{bmatrix}
(g - \bar{g}) \\
(g^* - \bar{g}^*) \\
(e^{eB/R} - \bar{e}^{eB/R}) \\
(e^{eR/\$} - \bar{e}^{eR/\$}) \\
(b_g - \bar{b}_g) \\
(b_g^* - \bar{b}_g^*) \\
(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) \\
(b_g^{*R.O.W.} - \bar{b}_g^{*R.O.W.}) \\
(\Delta e^{B/R} - \Delta \bar{e}^{B/R}) \\
(\Delta e^{R/\$} - \Delta \bar{e}^{R/\$}) \\
(b_{MC} - \bar{b}_{MC}) \\
(b_{TC} - \bar{b}_{TC})
\end{bmatrix}
\tag{21}
$$

3.2.B. Malaysia adopts the basket-peg regime and Thailand adopts the floating exchange rate regime

We have independent equations such as (1), (3A), (4A), (5), (6), (7), (8), (9), (10), (12), (13), (14), and (15B). 13 endogenous variables are y, y^*, r, r^*, $F^{\$}_{MC}$, $F^{\$}_{TC}$, m, m^*, $e^{B/R}$, $e^{R/\$}$, $e^{B/\$}$, p, p^*.

In this case, $e^{B/\$}$ is determined residually by equation (14). $e^{B/R}$ is determined residually by equation (15A). r^* is determined residually by equation (4A).

$$
\begin{bmatrix}
Y_y & Y^*_y & Y_r & \{Y_{e^{B/R}}(v_1 - 1) + v_1 Y_{e^{R/\$}}\} & 0 & 0 & Y_p & Y_{p^*} \\
Y^*_y & Y^*_{y^*} & Y^*_r & \{Y^*_{e^{B/R}}(v_1 - 1) + v_1 Y^*_{e^{R/\$}}\} & 0 & 0 & Y^*_p & Y^*_{p^*} \\
B_y & B_{y^*} & B_r & \{B_{e^{B/R}}(v_1 - 1) + v_1 B_{e^{R/\$}}\} & 0 & 0 & 0 & 0 \\
F_y & 0 & F_r & \{v_1 F_{e^{R/\$}}\} & 1 & 0 & 0 & 0 \\
0 & F^*_{y^*} & F^*_r & \{F^*_{e^{B/R}}(v_1 - 1) + v_1 F^*_{e^{R/\$}}\} & 0 & 1 & 0 & 0 \\
M_y & 0 & M_r & \{v_1 M_{e^{R/\$}}\} & 0 & 0 & 1 & 0 \\
-1 & 0 & S_r & \{S_{e^{B/R}}(v_1 - 1) + v_1 S_{e^{R/\$}}\} & 0 & 0 & S_p & S_{p^*} \\
0 & -1 & S^*_r & \{S^*_{e^{B/R}}(v_1 - 1) + v_1 S^*_{e^{R/\$}}\} & 0 & 0 & S^*_p & S^*_{p^*}
\end{bmatrix}
\begin{bmatrix}
(y - \bar{y}) \\
(y^* - \bar{y}^*) \\
(r - \bar{r}) \\
(e^{R/\$} - \bar{e}^{R/\$}) \\
(F^{\$}_{MC} - \bar{F}^{\$}_{MC}) \\
(F^{\$}_{TC} - \bar{F}^{\$}_{TC}) \\
(p - \bar{p}) \\
(p^* - \bar{p}^*)
\end{bmatrix}
$$

$$
= \begin{bmatrix}
1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & Y_{\Delta e^{B/R}} & Y_{\Delta e^{R/\$}} & 0 & 0 \\
0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & Y^*_{\Delta e^{B/R}} & Y^*_{\Delta e^{R/\$}} & 0 & 0 \\
0 & 0 & 0 & B_{e^{eR/\$}} & 1 & 1 & -1 & -1 & 0 & B_{\Delta e^{R/\$}} & -1 & -1 \\
0 & 0 & 0 & F_{e^{eR/\$}} & 0 & 0 & 0 & 0 & 0 & F_{\Delta e^{R/\$}} & 0 & 0 \\
0 & 0 & F^*_{e^{eB/R}} & F_{e^{eR/\$}} & 0 & 0 & 0 & 0 & F^*_{\Delta e^{B/R}} & F^*_{\Delta e^{R/\$}} & 0 & 0 \\
0 & 0 & 0 & M_{e^{eR/\$}} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & S_{\Delta e^{B/R}} & S_{\Delta e^{R/\$}} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & S^*_{\Delta e^{B/R}} & S_{\Delta e^{R/\$}} & 0 & 0
\end{bmatrix}
\begin{bmatrix}
(g - \bar{g}) \\
(g^* - \bar{g}) \\
(e^{eB/R} - \bar{e}^{eB/R}) \\
(e^{eR/\$} - \bar{e}^{eR/\$}) \\
(b_g - \bar{b}_g) \\
(b^*_g - \bar{b}^*_g) \\
(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) \\
(b_g^{*R.O.W.} - \bar{b}_g^{*R.O.W.}) \\
(\Delta e^{B/R} - \Delta \bar{e}^{B/R}) \\
(\Delta e^{R/\$} - \Delta \bar{e}^{R/\$}) \\
(b_{MC} - \bar{b}_{MC}) \\
(b_{TC} - \bar{b}_{TC})
\end{bmatrix}
\tag{22}
$$

3.2.C. *Both Malaysia and Thailand adopt the floating exchange rate regime*

We have 12 independent equations such as (1), (3A), (4A), (5), (6), (7), (8), (9), (10), (12), (13), and, (14). 12 endogenous variables are y, y^*, r, r^*, b_{MC}, b_{TC}, $e^{B/R}$, $e^{R/\$}$, $e^{B/\$}$, $F^{\$}_{TC}$, p, p^*.

In this case, m and m^* are both exogenous variable since both countries have monetary policy autonomy. $e^{B/R}$ is determined residually by equation (14) and r^* is also determined residually by equation (4A). Equation (12) puts some constraints on $F^{\$}_{TC}$, so that it is endogenous variable[11]. The reduced forms are as follows.

$$
\begin{bmatrix}
Y_y & Y_{y^*} & Y_r & Y_{e^{B/R}} & Y_{e^{R/\$}} & 0 & 0 & 0 & Y_p & Y_{p^*} \\
Y^*_y & Y^*_{y^*} & 0 & Y^*_{e^{B/R}} & Y^*_{e^{R/\$}} & 0 & 0 & 0 & Y^*_p & Y^*_{p^*} \\
B_y & B_{y^*} & B_r & B_{e^{B/R}} & B_{e^{R/\$}} & 1 & 0 & 1 & 0 & 0 \\
F_y & 0 & F_r & 0 & F_{e^{R/\$}} & 0 & 0 & 0 & 0 & 0 \\
0 & F^*_{y^*} & F^*_r & F^*_{e^{B/R}} & F^*_{e^{R/\$}} & 0 & 1 & 0 & 0 & 0 \\
M_y & 0 & M_r & 0 & M_{e^{R/\$}} & 0 & 0 & 0 & 1 & 0 \\
-1 & 0 & S_r & S_{e^{B/R}} & S_{e^{R/\$}} & 0 & 0 & 0 & S_p & S_{p^*} \\
0 & -1 & 0 & S^*_{e^{B/R}} & S^*_{e^{R/\$}} & 0 & 0 & 0 & S^*_p & S^*_{p^*} \\
0 & 0 & 0 & 0 & 1 & 1 & 0 & 0 & 1 & 0 \\
0 & 0 & 0 & 1 & 1 & 0 & 1 & 1 & 0 & 1
\end{bmatrix}
\begin{bmatrix}
(y - \bar{y}) \\
(y^* - \bar{y}^*) \\
(r - \bar{r}) \\
(e^{B/R} - \bar{e}^{B/R} \\
(e^{R/\$} - \bar{e}^{R/\$}) \\
(b_{MC} - \bar{b}_{MC}) \\
(F^{\$}_{TC} - \bar{F}^{\$}_{TC}) \\
(b_{TC} - \bar{b}_{TC}) \\
(p - \bar{p}) \\
(p^* - \bar{p}^*)
\end{bmatrix}
$$

[11] Since this is two-country model, one of the two central banks has to intervene into the foreign exchange rate market to maintain equation (14).

$$
= \begin{bmatrix}
1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & Y_{\Delta e^{B/R}} & Y_{\Delta e^{R/\$}} & 0 & 0 & 0 \\
0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & Y^*_{\Delta e^{B/R}} & Y^*_{\Delta e^{R/\$}} & 0 & 0 & 0 \\
0 & 0 & B_{e^{eB/R}} & B_{e^{eR/\$}} & 1 & 1 & -1 & -1 & B_{\Delta e^{B/R}} & B_{\Delta e^{R/\$}} & 0 & 0 & 0 \\
0 & 0 & 0 & F_{e^{eR/\$}} & 0 & 0 & 0 & 0 & 0 & F_{\Delta e^{R/\$}} & -1 & 0 & 0 \\
0 & 0 & F^*_{e^{eB/R}} & F^*_{e^{eR/\$}} & 0 & 0 & 0 & 0 & F^*_{\Delta e^{B/R}} & F^*_{\Delta e^{R/\$}} & 0 & 0 & 0 \\
0 & 0 & 0 & M_{e^{eR/\$}} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & S_{\Delta e^{B/R}} & S_{\Delta e^{R/\$}} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & S^*_{\Delta e^{B/R}} & S^*_{\Delta e^{R/\$}} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -1 & 1 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1
\end{bmatrix}
\begin{bmatrix}
(g - \bar{g}) \\
(g^* - \bar{g}^*) \\
(e^{eB/R} - \bar{e}^{eB/R}) \\
(e^{eR/\$} - \bar{e}^{eR/\$}) \\
(b_g - \bar{b}_g) \\
(b^*_g - \bar{b}^*_g) \\
(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) \\
(b_g^{*R.O.W.} - \bar{b}_g^{*R.O.W.}) \\
(\Delta e^{B/R} - \Delta\bar{e}^{B/R}) \\
(\Delta e^{R/\$} - \Delta\bar{e}^{R/\$}) \\
(F^{\$}_{MC} - \bar{F}^{\$}_{MC}) \\
(m - \bar{m}) \\
(m_* - \bar{m}^*)
\end{bmatrix}
\tag{23}
$$

3.2.D. Malaysia adopts the dollar-peg regime and Thailand adopts the floating exchange rate regime

We have 11 independent equations such as (1), (3D), (4A), (5D), (7), (8), (9), (10), (12), (13), (14). 11 endogenous variables are y, y^*, r, r^*, $F^{\$}_{MC}$, m, b_{TC}, $e^{B/R}$, $e^{B/\$}$, p, p^*.

In this case, r is determined residually by equation (5A)[12]. $e^{B/\$}$ is determined residually by equation (14). The reduced forms are follows;

$$
\begin{bmatrix}
Y_y & Y_{y^*} & 0 & Y_{e^{B/R}} & 0 & 0 & 0 & Y_p & Y_{p^*} \\
Y^*_y & Y^*_{y^*} & Y^*_{r^*} & Y^*_{e^{B/R}} & 0 & 0 & 0 & Y_{p^*} & Y^*_{p^*} \\
B_y & B_{y^*} & B_{r^*} & B_{e^{B/R}} & 1 & 1 & 0 & 0 & 0 \\
0 & 0 & 1 & 1 & 0 & 0 & 0 & 0 & 0 \\
M_y & 0 & 0 & 0 & 0 & 1 & 0 & 1 & 0 \\
-1 & 0 & 0 & S_e & 0 & 0 & 0 & S_p & S_{p^*} \\
0 & -1 & S^*_{r^*} & S^*_{e^{B/R}} & 0 & 0 & 0 & S^*_p & S^*_{p^*} \\
0 & 0 & 0 & 0 & 0 & 1 & -1 & 1 & 0 \\
0 & 0 & 0 & 1 & 1 & 0 & 0 & 0 & 1
\end{bmatrix}
\begin{bmatrix}
(y - \bar{y}) \\
(y^* - \bar{y}^*) \\
(r^* - \bar{r}^*) \\
(e^{B/R} - \bar{e}^{B/R}) \\
(b_{TC} - \bar{b}_{TC}) \\
(F^{\$}_{MC} - \bar{F}^{\$}_{MC}) \\
(m - \bar{m}) \\
(p - \bar{p}) \\
(p^* - \bar{p}^*)
\end{bmatrix} =
$$

[12] Since Malaysia adopts dollar-peg $e^{eR/\$ = e^{R/\$}}$, therefore, according to the equation (5A), $r = r^{R.O.W.}$.

$$\begin{bmatrix} 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & Y_{\Delta e^{B/R}} & Y_{\Delta e^{R/\$}} & Y_{e^{R/\$}} & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & Y^*_{\Delta e^{B/R}} & Y^*_{\Delta e^{R/\$}} & Y_{e^{R/\$}} & 0 & 0 \\ 0 & 0 & B_{e^{eB/R}} & B_{e^{eR/\$}} & 1 & 1 & -1 & -1 & B_{\Delta e^{B/R}} & B_{\Delta e^{R/\$}} & B_{e^{R/\$}} & -1 & 0 \\ 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & M_{e^{eR/\$}} & 0 & 0 & 0 & 0 & 0 & 0 & M_{e^{R/\$}} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & S_{\Delta e^{B/R}} & S_{\Delta e^{R/\$}} & S_{e^{R/\$}} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & S^*_{\Delta e^{B/R}} & S^*_{\Delta e^{R/\$}} & S^*_{e^{R/\$}} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -1 & -1 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -1 & 0 & 1 \end{bmatrix} \begin{bmatrix} (g - \bar{g}) \\ (g^* - \bar{g}^*) \\ (e^{eB/R} - \bar{e}^{eB/R}) \\ (e^{eR/\$} - \bar{e}^{eR/\$}) \\ (b_g - \bar{b}_g) \\ (b^*_g - \bar{b}^*_g) \\ (b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) \\ (b_g^{*R.O.W.} - \bar{b}_g^{*R.O.W.}) \\ (\Delta e^{B/R} - \Delta \bar{e}^{B/R}) \\ (\Delta e^{R/\$} - \Delta \bar{e}^{R/\$}) \\ (e^{R/\$} - \bar{e}^{R/\$}) \\ (F^{\$}_{TC} - \bar{F}^{\$}_{TC}) \\ (m^* - \bar{m}^*) \end{bmatrix} \tag{24}$$

3.2.E. Both Malaysia and Thailand adopt the dollar-peg regime

We have 11 independent equations such as (1), (3D), (4A), (5D), (7), (8), (9), (10), (12), (13), (14). 11 endogenous variables are y, y^*, r, r^*, $F^{\$}_{MC}$, $F^{\$}_{TC}$, m, m^*, $e^{B/\$}$, p, p^*.

r and r^* are determined residually by equation (5A), and (6A)[13]. In addition, $e^{B/R}$ is determined residually by equation (14)[14]. Reduced forms are follows:

$$\begin{bmatrix} Y_y & Y_{y^*} & 0 & 0 & 0 & 0 & Y_p & Y_{p^*} \\ Y^*_y & Y^*_{y^*} & 0 & 0 & 0 & 0 & Y^*_p & Y^*_{p^*} \\ B_y & B_{y^*} & 1 & 1 & 0 & 0 & 0 & 0 \\ M_y & 0 & 0 & 0 & -1 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 & 0 & 0 & S_p & S_{p^*} \\ 0 & -1 & 0 & 0 & 0 & 0 & S^*_p & S^*_{p^*} \\ 0 & 0 & 1 & 0 & -1 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 & 0 & -1 & 0 & 1 \end{bmatrix} \begin{bmatrix} (y - \bar{y}) \\ (y^* - \bar{y}^*) \\ (F^{\$}_{MC} - \bar{F}^{\$}_{MC}) \\ (F^{\$}_{TC} - \bar{F}^{\$}_{TC}) \\ (m - \bar{m}) \\ (m^* - \bar{m}^*) \\ (p - \bar{p}) \\ (p^* - \bar{p}^*) \end{bmatrix} =$$

[13] Since Malaysia adopts dollar-peg $e^{eR/\$} = e^{R/\$}$, therefore, according to the equation (5A), $r = r^{R.O.W.}$. Similarly, Thailand adopts dollar-peg $e^{eB/\$} = e^{B/\$}$, therefore, according to the equation (6A), $r^* = r^{R.O.W.}$.

[14] Since, ringgit-dollar and baht-dollar rate are fixed, baht-ringgit rate will also fixed due to the equation (14).

$$\begin{bmatrix} 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & Y_{\Delta e^{B/R}} & Y_{\Delta e^{R/\$}} & Y_{e^{R/\$}} & 0 \\ 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & Y^*_{\Delta e^{R/\$}} & Y^*_{\Delta e^{R/\$}} & 0 & Y^*_{e^{B/\$}} \\ 0 & 0 & B_{e^{eB/R}} & B_{e^{eR/\$}} & 1 & 1 & -1 & -1 & B_{\Delta e^{B/R}} & B_{\Delta e^{R/\$}} & B_{e^{R/\$}} & B_{e^{R/\$}} \\ 0 & 0 & 0 & M_{e^{eR/\$}} & 0 & 0 & 0 & 0 & 0 & 0 & M_{e^{R/\$}} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & S_{\Delta e^{B/R}} & S_{\Delta e^{R/\$}} & S_{e^{R/\$}} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & S^*_{\Delta e^{B/R}} & S^*_{\Delta e^{R/\$}} & 0 & S^*_{e^{R/\$}} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -1 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -1 \end{bmatrix} \begin{bmatrix} (g - \bar{g}) \\ (g^* - \bar{g}^*) \\ (e^{eB/R} - \bar{e}^{eB/R}) \\ (e^{eR/\$} - \bar{e}^{eR/\$}) \\ (b_g - \bar{b}_g) \\ (b_g^* - \bar{b}_g^*) \\ (b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) \\ (b_g^{*R.O.W.} - \bar{b}_g^{*R.O.W.}) \\ (\Delta e^{B/R} - \Delta \bar{e}^{B/R}) \\ (\Delta e^{R/\$} - \Delta \bar{e}^{R/\$}) \\ (e^{R/\$} - \bar{e}^{R/\$}) \\ (e^{B/\$} - e_{B/\$}) \end{bmatrix} \tag{25}$$

4. EXOGENOUS SHOCKS, CAPITAL SUBSTITUTABILITY AND EXCHANGE RATE REGIMES

The exogenous shock we consider is a change in foreign holdings of ringgit-denominated bonds: $(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.})$. In this section, we explain how the effects of this exogenous change differ according to the substitutability between ringgit-denominated bonds and baht-denominated bonds, and the choice of exchange rate regime.

4.1. Imperfect capital substitution between Malaysian bonds and Thai bonds

We will compare the effect of an exogenous increase of Malaysian bonds held by the R.O.W. residents under each exchange rate regime.

The amount of Malaysian bonds held by R.O.W. residents change from $\bar{b}_g^{R.O.W.}$ to $b_g^{R.O.W.}$. If the country does not have a dollar-peg regime, the change of Malaysian bonds holding by the R.O.W. residents will change the ringgit-dollar and the baht-ringgit rates. The ringgit-dollar and baht-ringgit fluctuations imply increased exchange risk, which is damaging to the country welfare. If the country does have a dollar-peg regime, and the ringgit-dollar rate change (due to the change of Malaysian bonds holdings by the R.O.W. residents) is in the direction of a strong dollar, authorities must sell dollars and buy ringgits to maintain the fixed parity. The resulting loss in foreign exchange reserves can lead to higher expectation of devaluation. This also means higher exchange risk. Therefore, in general the effect of the original change of Malaysian bonds holdings by the R.O.W. residents on country welfare can be divided into four parts, some of which are on present under some exchange rate regimes:

① direct effect of the original change in Malaysian bond holdings by the R.O.W. residents (expression ① in each subsection of Appendix)

② indirect effect of the increased ringgit-baht exchange rate risk due to the induced change in the Malaysian bonds holdings by the R.O.W. residents on all eight markets (goods, domestic bonds, dollar-denominated assets and the money for each country) (expression ② in each subsection of Appendix)

③ indirect effect of the increased ringgit-dollar rate risk due to the induced change in the Malaysian bonds holdings by the R.O.W. residents on all eight markets (goods, domestic bonds, dollar-denominated assets and the money for each country) (expression ③ in each subsection of Appendix)

④ indirect effect of the increased expectation of devaluation of the ringgit against the dollar, due to loss of foreign exchange reserves (expression ④ in each subsection of Appendix, where applicable)

We examine the relative superiority of the flexible, the dollar-peg and the basket-peg regimes using Malaysia's and Thailand's data below. In this section we indicate which of the four effects exists under each of the three regimes, and discuss their relative strengths.

Under flexible exchange rates (between the dollar and the ringgit), we have the first three effects. In contrast, under the dollar-peg regime, the third and the fourth of these effects do not exist, if the market believes the fixed rate can be maintained. In such a case, the larger the effects of exchange risk, the smaller the GDP fluctuation under the dollar-peg than under floating. However if loss of foreign exchange reserves leads the market to expect the peg will be abandoned, the fourth effect will be present. And if the peg is indeed abandoned, the third effect will also come into play.

Under a basket-peg, the ringgit-dollar and the baths-ringgit rates fluctuate. Therefore, country welfare changes comprise the first three effects, as in the case of flexible exchange rates. However, ringgit-dollar rate and the baht-ringgit rates always change in opposite directions. Because of this, compared with the dollar-peg, the direct effect on the country welfare (for example current account or GDP) is smaller.

4.2. *Perfect substitution between Malaysian bonds and Thai bonds*

Under the perfect substitution between Malaysian bonds and Thai bonds, in general the effect of the original change of Malaysian bonds holdings by the R.O.W. residents on country welfare can be divided into four parts, some of which are on present under some exchange rate regimes;

① direct effect of the original change in Malaysian bond holdings by the R.O.W. residents

② indirect effect of the increased ringgit-baht exchange rate risk due to the induced change in the Malaysian bonds holdings by the R.O.W. residents on all eight markets (goods, domestic bonds, dollar-denominated assets and the money for each country)

③ indirect effect of the increased ringgit-dollar rate risk due to the induced change in the Malaysian bonds holdings by the R.O.W. residents on all eight markets (goods, domestic bonds, dollar-denominated assets and the money for each country)

④ indirect effect of the increased expectation of devaluation of the ringgit against the dollar, due to loss of foreign exchange reserves

⑤ direct effect of the original change in Thai bond holdings by the R.O.W. residents[15]

Under flexible exchange rates (between the dollar and the ringgit), we have the effects: 1, 2, 3, and 5. In contrast, under the dollar-peg regime, we have 1, 2, 4, and 5. Under a basket-peg, the ringgit-dollar and the baths-ringgit rates fluctuate. Therefore, country welfare changes comprise the effects 1, 2, 3, and 5, as in the case of flexible exchange rates.

5. THE DIFFERENT POLICY OBJECTIVES AND LOSS FUNCTIONS

Policy authorities in both countries have policy objectives reflected in the loss functions they are minimizing. This section lays out the different policy objectives and the corresponding loss functions. We also consider some cases in which the two authorities jointly minimize a common loss function.

5.1. GDP stability as policy objectives

In this case, we assume that the Malaysian authority wants to minimize the fluctuation of the GDP of Malaysia. The loss function can be defined as follows.

$$L_1 = (y - \bar{y})^2 \tag{26}$$

On the other hand, we assume that the Thai authority wants to minimize the fluctuation of the Thai GDP. The loss function will be defined as follows.

$$L_1^* = (y^* - \bar{y}^*)^2 \tag{27}$$

5.2. Current account stability as policy objectives

In this case, we assume that the Malaysian authority wants to minimize the fluctuation of the GDP of Malaysia.

$$L_2 = (ca - \overline{ca})^2 \tag{28}$$

On the other hand, we assume that the Thailand authority wants to minimize the fluctuation of the current account of Thailand. The loss function can be defined as follows.

$$L_2^* = (ca^* - \overline{ca}^*)^2 \tag{29}$$

5.3. Exchange rate stability as policy objectives

We assume that the policy goal for Malaysia is to stabilize the ringgit-dollar rate. The loss function will be defined as follows:

$$L_3 = (e^{R/\$} - \bar{e}^{R/\$})^2 \tag{30}$$

On the other hand, we assume that the policy goal for Thailand is to stabilize the baht-dollar rate. The loss function will be defined as follows:

$$L_3^* = (e^{B/\$} - \bar{e}^{B/\$})^2 \tag{31}$$

[15] Since Malaysian bonds and Thai bonds are perfect substitutes, there is also direct shock of original change in Thai bond holdings by the R.O.W. residents.

5.4. Price level stability as policy objectives

We assume that the policy goal of Malaysia is to stabilize price level. The objective function for Malaysian authority is

$$L_4 = (p - \bar{p})^2 \tag{32}$$

On the other hand, we assume that the policy goal of Thailand is to stabilize price level. The objective function of Thai authority is

$$L_4^* = (p^* - \bar{p}^*)^2 \tag{33}$$

5.5. GDP and Price level stability as policy objectives

We assume that the policy goal of Malaysia is to stabilize price level and GDP. The objective function of Malaysian authority will be defined as follows:

$$L_5 = \{(y - \bar{y})^2 + \varpi_1 (p - \bar{p})^2\} \tag{34}$$

On the other hand, we assume that the policy goal of Thailand is to stabilize GDP and price level. The objective function of Thai authority is

$$L_5^* = \{(y^* - \bar{y}^*)^2 + \varpi_1^*(p^* - \bar{p}^*)^2\} \tag{35}$$

5.6. Joint Minimization: GDP stability as policy objective

In this case, we assume that Malaysia and Thailand agree to minimize the common loss function as follows:

$$L_6 = \{a(y - \bar{y})^2 + (1 - a)(y^* - \bar{y}^*)^2\} \quad (0 \leq a \leq 1) \tag{36}$$

5.7. Joint Minimization: Current account stability as policy objective

In this case, we assume that Malaysia and Thailand agree to minimize the common loss function of the current account.

$$L_7 = \{a(ca - \overline{ca})^2 + (1 - a)(ca^* - \overline{ca}^*)^2\} \quad (0 \leq a \leq 1) \tag{37}$$

6. USING BASKET WEIGHTS AS POLICY TOOLS

Before we conduct empirical analyses to compare the welfare effects of different exchange rate regimes, we consider the possibility of using basket weights as policy tools. Yoshino, Kaji, and Suzuki (2002, 2004) have pointed out that using the trade weights as basket weights was not always optimal, and calculated the optimal levels of weights using a small country model. Here we derive the optimal weights in a two-country setting.

6.1. Imperfect capital substitution between Malaysian bonds and Thai bonds

We analyze two cases, one in which both Malaysia and Thailand individually adopt a basket-peg regime, and another in which only Malaysia adopts a basket-peg regime. Thailand adopts a floating exchange rate regime in the latter case. All of the different policy objectives will be considered.

6.1.A. Both Malaysia and Thailand individually adopt basket-peg regimes

6.1.A(1). GDP stability as policy objectives

Until now, we have treated the weights in the basket as unknown and fixed. But the weights on the basket (v_1, v_2) can be considered an additional policy tool, while monetary policy is busy intervening to maintain the value of the basket. They are exogenous variables that can be chosen by the policy authorities, to minimize the loss arising from given shocks to the economy. With this in mind, we calculate the optimal value of one of the weights.

First, we think about the case when the Malaysian authority wants to stabilize the GDP of Malaysia. The loss function is as follows.

$$L_1 = (y - \bar{y})^2 \tag{26}$$

The policy tool of Malaysia is v_1.

$$L_1 = (y - \bar{y})^2$$

$$= \begin{Bmatrix} A_1 v_1 (b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + B_1 (b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + C_1 v_1 (\Delta e^{B/R} - \Delta \bar{e}^{B/R}) \\ +D_1 (\Delta e^{B/R} - \Delta \bar{e}^{B/R}) + E_1 v_1 (\Delta e^{R/\$} - \Delta \bar{e}^{R/\$}) + F_1 (\Delta e^{R/\$} - \Delta \bar{e}^{R/\$}) \end{Bmatrix}^2$$

From the first order condition $\frac{\partial L_1}{\partial v_1}$, we have

$$v_1 = -\frac{B_1(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + D_1(\Delta e^{B/R} - \Delta \bar{e}^{B/R}) + F_1(\Delta e^{R/\$} - \Delta \bar{e}^{R/\$})}{A_1(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + C_1(\Delta e^{B/R} - \Delta \bar{e}^{B/R}) + E_1(\Delta e^{R/\$} - \Delta \bar{e}^{R/\$})} \tag{38}$$

where $B_1 = f_{b1}(v_2)$, $D_1 = f_{d1}(v_2)$, $F_1 = f_{f1}(v_2)$ and $(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.})$, $(\Delta e^{B/R} - \Delta \bar{e}^{B/R})$, and $(\Delta e^{R/\$} - \Delta \bar{e}^{R/\$})$ show, respectively, the initial change of Malaysian bond holding by the R.O.W. residents, the induced increase in baht-ringgit exchange rate risk and in ringgit-dollar exchange rate risk.

If the value given in equation (38) is chosen the basket-peg can achieve the goal of GDP stabilization. True, there may be occasions in which the right-hand-side of equation (38) happens to equal the trade-weight of a given country. But this cannot expect to be true in general. It follows that if the policy objective is GDP stability, choosing trade-weights as weights on the corresponding exchange rate in the basket does not have theoretical support. The obvious problem is the complexity of calculating values such as the on given by equation (38). Countries that choose to use trade-weights as weights in the basket are doing so out of convenience more than anything else.

It is clear from the equation (38) that the optimal value of the basket depends not only on the partial derivatives of home country markets, but also on the partial derivatives of the foreign country markets.

Then we assume that the Thailand authority wants to minimize the fluctuation of the Thailand GDP. The loss function can be defined as follow.

$$L_1^* = (y^* - \bar{y}^*)^2 \tag{28}$$

The policy tool of Thailand is the v_2.

$$L_1^* = (y^*\bar{y}^*)^2$$
$$= \left\{ \begin{array}{l} A_1^* \upsilon_2 (b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + B_1^* (b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + C_1^* \upsilon_2 (\Delta e^{B/R} - \Delta \overline{e^{B/R}}) \\ + D_1^* (\Delta e^{B/R} - \Delta \bar{e}^{B/R}) + E_1^* \upsilon_2 (\Delta e^{R/\$} - \Delta \bar{e}^{R/\$}) + F_1^* (\Delta e^{R/\$} - \Delta \bar{e}^{R/\$}) \end{array} \right\}^2$$

From the first order condition, $\frac{\partial L_1^*}{\partial \upsilon_2} = 0$, we have

$$\upsilon_2 = -\frac{B_1^*(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + D_1^*(\Delta e^{B/R} - \Delta \overline{e^{B/R}}) + F_1^*(\Delta e^{R/\$} - \Delta \bar{e}^{R/\$})}{A_1(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + C_1^*(\Delta e^{B/R} - \Delta \overline{e^{B/R}}) + E_1^*(\Delta e^{R/\$} - \Delta \bar{e}^{R/\$})} \tag{39}$$

$$(B_1^* = f_{b1}^*(\upsilon_1),\ D_1^* = f_{d1}^*(\upsilon_1),\ F_1^* = f_{f1}^*(\upsilon_1))$$

where $(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.})$, $(\Delta e^{B/R} - \Delta \bar{e}^{B/R})$, and $(\Delta e^{R/\$} - \Delta \bar{e}^{R/\$})$ show, respectively, the initial change of Malaysian bond holding by the R.O.W. residents, the induced increase in bahts-ringgit exchange rate risk and in ringgit-dollar exchange rate risk.

We conclude that the optimal values of the baskets in Malaysia and in Thailand are different.

6.1.A(2). Current Account Stability as policy objectives

We assume that Malaysia chooses current account stability as their policy objective. In that case, the objective function for the Malaysian authority is

$$L_2 = (ca - \overline{ca})^2 \tag{28}$$

The current account is affected by the change of the domestic bonds holding by the R.O.W. residents, as in the case when GDP stability is the policy goal in subsection (1a) above. The effects that exist are ①, ②, and ③ under floating exchange rates, ①, ②, and ④ under the dollar-peg and ①, ②, and ③ under the basket-peg.

The difference with the case of current account stability objective is that here the direct effect ① itself a set of five effects, a subset of which exists under the different regimes. These five effects are ①-a: direct effect of the change of the domestic bonds holding by the R.O.W. residents, ①-b: indirect effect through effects on domestic (Malaysian) GDP, ①-c: indirect effect through effects on the foreign (Thailand) GDP, ①-d: indirect effect through effects on the ringgit-dollar rate, and lastly ①-e: indirect effect through effects on the foreign reserves.

$$L_2 = (ca - \overline{ca})^2$$
$$= \left\{ \begin{array}{l} A_2 \upsilon_1 (b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + B_2 (b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + C_2 \upsilon_1 (\Delta e - \Delta \bar{e}) \\ + D_2 (\Delta e - \Delta \bar{e}) + E_2 \upsilon_1 (\Delta e^{R/\$} - \Delta \bar{e}^{R/\$}) + F_2 (\Delta e^{R/\$} - \Delta \bar{e}^{R/\$}) \end{array} \right\}^2$$

From the first order condition $\frac{\partial L_2}{\partial \upsilon_1} = 0$, we have

$$v_1 = -\frac{B_2(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + D_2(\Delta e^{B/R} - \Delta\bar{e}^{B/R}) + F_2(\Delta e^{R/\$} - \Delta\bar{e}^{R/\$})}{A_2(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + C_2(\Delta e^{B/R} - \Delta\bar{e}^{B/R}) + E_2(\Delta e^{R/\$} - \Delta\bar{e}^{R/\$})} \tag{40}$$

$$(B_2 = f_{b2}(v_2), D_2 = f_{d2}(v_2), F_2 = f_{f2}(v_2))$$

where $(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.})$, $(\Delta e^{B/R} - \Delta\bar{e}^{B/R})$, and $(\Delta e^{R/\$} - \Delta\bar{e}^{R/\$})$ show, respectively, the initial change of Malaysian bond holding by the R.O.W. residents, the induced increase in bahts-ringgit exchange rate risk and in ringgit-dollar exchange rate risk.

On the other hand, we assume that the Thailand authority wants to minimize the fluctuation of the Thailand current account.

The objective function of Thailand can be defined as follows.

$$L_2^* = (ca^* - \overline{ca}^*)^2 \tag{29}$$

Their policy tool is v_2.

$$\begin{aligned} L_2^* &= (ca^* - \overline{ca}^*)^2 \\ &= \left\{ \begin{array}{l} A_2^* v_2(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + B_2^*(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + C_2^* v_2(\Delta e^{B/R} - \Delta\bar{e}^{B/R}) \\ + D_2^*(\Delta e^{B/R} - \Delta\bar{e}^{B/R}) + E_2^* v_2(\Delta e^{R/\$} - \Delta\bar{e}^{R/\$}) + F_2^*(\Delta e^{R/\$} - \Delta\bar{e}^{R/\$}) \end{array} \right\}^2 \end{aligned}$$

From the first order condition, $\frac{\partial L_2^*}{\partial v_2} = 0$, we have

$$v_2 = -\frac{B_2^*(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + D_2^*(\Delta e^{B/R} - \Delta\bar{e}^{B/R}) + F_2^*(\Delta e^{R/\$} - \Delta\bar{e}^{R/\$})}{A_2^*(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + C_2^*(\Delta e^{B/R} - \Delta\bar{e}^{B/R}) + E_2^*(\Delta e^{R/\$} - \Delta\bar{e}^{R/\$})} \tag{41}$$

$$(B_2^* = f_{b2}^*(v_1), D_2^* = f_{d2}^*(v_1), F_2^* = f_{f2}^*(v_1))$$

where $(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.})$, $(\Delta e^{B/R} - \Delta\bar{e}^{B/R})$, and $(\Delta e^{R/\$} - \Delta\bar{e}^{R/\$})$ show, respectively, the initial change of Malaysian bond holding by the R.O.W. residents, the induced increase in bahts-ringgit exchange rate risk and in ringgit-dollar exchange rate risk.

6.1.A(3). Exchange rate stability as policy objectives

We assume that the policy goal of Malaysian authority is to stabilize the ringgit-dollar rate. The objective function of the Malaysian authority is

$$L_3 = (e^{R/\$} - \bar{e}^{R/\$})^2 \tag{30}$$

Evidently, the beast choice is the regime that fixes the ringgit-dollar rate at a constant level. Compared to the dollar peg regime, the basket peg regime is inferior unless the weight on the US dollar $(1 - v_1)$ is set to 1. This is confirmed by solving the first-order condition for $\frac{\partial L_3}{\partial v_1} = 0$, which gives us

$$v_1 = 0 \tag{42}$$

On the other hand, we assume that the policy goal of Thai authority is to stabilize the baht-dollar rate. The objective function of Thai authority is

$$L_3^* = (e^{B/\$} - \bar{e}^{B/\$})^2 \tag{31}$$

Evidently, the best choice is the regime that fixes the bats-dollar rate at a constant level. Compared to the dollar peg regime, the basket peg regime is inferior unless the weight on the US dollar $(1 - \upsilon_2)$ is set to 1. This is confirmed by solving the first-order condition $\frac{\partial L_3}{\partial \upsilon_2} = 0$ for υ_1, which gives us

$$\upsilon_2 = 0 \tag{43}$$

6.1.A(4). Price Level Stability as policy objectives

We assume that the policy goal is to stabilize price. The objective function is

$$L_4 = (p - \bar{p})^2 \tag{32}$$

Their policy objective is υ_1.

$$L_4 = (p - \bar{p})^2$$
$$= \left\{ \begin{array}{l} A_4\upsilon_1(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + B_4(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + C_4\upsilon_1(\Delta e^{B/R} - \Delta\bar{e}^{B/R}) \\ + D_4(\Delta e^{B/R} - \Delta\bar{e}^{B/R}) + E_4\upsilon_1(\Delta e^{R/\$} - \Delta\bar{e}^{R/\$}) + F_4(\Delta e^{R/\$} - \Delta\bar{e}^{R/\$}) \end{array} \right\}^2$$

From the first order condition $\frac{\partial L_4}{\partial \upsilon_1} = 0$, we have

$$\upsilon_1 = -\frac{B_4(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + D_4(\Delta e^{B/R} - \Delta\bar{e}^{B/R}) + F_4(\Delta e^{R/\$} - \Delta\bar{e}^{R/\$})}{A_4(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + C_4(\Delta e^{B/R} - \Delta\bar{e}^{B/R}) + E_4(\Delta e^{R/\$} - \Delta\bar{e}^{R/\$})} \tag{44}$$

$$(B_4 = f_{b4}(\upsilon_2),\ D_4 = f_{d4}(\upsilon_2),\ F_4 = f_{f4}(\upsilon_2))$$

On the other hand, we assume that the policy goal of Thai authority is to stabilize price level. The objective function of the Thai authority is

$$L_4^* = (p^* - \bar{p}^*)^2 \tag{33}$$

Their policy objective is υ_2.

$$L_4^* = (p^* - \bar{p}^*)^2$$
$$= \left\{ \begin{array}{l} A_4^*\upsilon_2(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + B_4^*(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + C_4^*\upsilon_2(\Delta e^{B/R} - \Delta\bar{e}^{B/R}) \\ + D_4^*(\Delta e^{B/R} - \Delta\bar{e}^{B/R}) + E_4^*\upsilon_2(\Delta e^{R/\$} - \Delta\bar{e}^{R/\$}) + F_4^*(\Delta e^{R/\$} - \Delta\bar{e}^{R/\$}) \end{array} \right\}^2$$

From the first order condition $\frac{\partial L_4^*}{\partial \upsilon_2} = 0$, we have

$$\upsilon_2 = -\frac{B_4^*(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + D_4^*(\Delta e^{B/R} - \Delta\bar{e}^{B/R}) + F_4^*(\Delta e^{R/\$} - \Delta\bar{e}^{R/\$})}{A_4^*(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + C_4^*(\Delta e^{B/R} - \Delta\bar{e}^{B/R}) + E_4^*(\Delta e^{R/\$} - \Delta\bar{e}^{R/\$})} \tag{45}$$

$$(B_4^* = f_{b4}(\upsilon_1),\ D_4^* = f_{d4}(\upsilon_1),\ F_4^* = f_{f4}(\upsilon_1))$$

6.1.A(5). GDP and Price level stability as policy objectives

We assume that the policy goal of the Malaysian authority is to stabilize GDP and price level. The objective function of the Malaysian authority is

$$L_5 = \{(y - \bar{y})^2 + \varpi_1 (p - \bar{p})^2\} \tag{33}$$

Their policy objective is υ_1.

$$L_5 = \{(y - \bar{y})^2 + \varpi_1 (p - \bar{p})^2\}$$
$$= \left\{ \begin{array}{l} A_5 \upsilon_1 (b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + B_5 (b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + C_5 \upsilon_1 (\Delta e^{B/R} - \Delta \bar{e}^{B/R}) \\ + D_5 (\Delta e^{B/R} - \Delta \bar{e}^{B/R}) + E_5 \upsilon_1 (\Delta e^{R/\$} - \Delta \bar{e}^{R/\$}) + F_5 (\Delta e^{R/\$} - \Delta \bar{e}^{R/\$}) \end{array} \right\}^2$$

From the first order condition $\frac{\partial L_5}{\partial \upsilon_1} = 0$, we have

$$\upsilon_1 = -\frac{B_5 (b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + D_5 (\Delta e^{B/R} - \Delta \bar{e}^{B/R}) + F_5 (\Delta e^{R/\$} - \Delta \bar{e}^{R/\$})}{A_5 (b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + C_5 (\Delta e^{B/R} - \Delta \bar{e}^{B/R}) + E_5 (\Delta e^{R/\$} - \Delta \bar{e}^{R/\$})} \tag{46}$$

$$(B_5 = f_{b5}(\upsilon_2, \varpi_1), D_5 = f_{d5}(\upsilon_2, \varpi_1), F_5 = f_{f5}(\upsilon_2, \varpi_1))$$

At the same time, we assume that the policy goal of Thai authority is to stabilize GDP and price level. The objective function of the Thai authority is

$$L_7^* = \{(y^* - \bar{y}^*)^2 + (p - \bar{p}^*)^2\} \tag{34}$$

Their policy objective is υ_2.

$$L_5^* = \{(y - \bar{y}^*)^2 + \varpi_1^* (p^* - \bar{p}^*)^2\}$$
$$= \left\{ \begin{array}{l} A_5^* \upsilon_2 (b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + B_5^* (b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + C_5^* \upsilon_2 (\Delta e^{B/R} - \Delta \bar{e}^{B/R}) \\ + D_5^* (\Delta e^{B/R} - \Delta \bar{e}^{B/R}) + E_5^* \upsilon_2 (\Delta e^{R/\$} - \Delta \bar{e}^{R/\$}) + F_5^* (\Delta e^{R/\$} - \Delta \bar{e}^{R/\$}) \end{array} \right\}^2$$

From the first order condition $\frac{\partial L_5^*}{\partial \upsilon_2}$, we have

$$\upsilon_2 = -\frac{B_5^* (b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + D_5^* (\Delta e^{B/R} - \Delta \bar{e}^{B/R}) + F_5^* (\Delta e^{R/\$} - \Delta \bar{e}^{R/\$})}{A_5^* (b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + C_5^* (\Delta e^{B/R} - \Delta \bar{e}^{B/R}) + E_5^* (\Delta e^{R/\$} - \Delta \bar{e}^{R/\$})} \tag{47}$$

$$(B_5^* = f_{b5}(\upsilon_1, \varpi_1^*), D_5^* = f_{d5}(\upsilon_1, \varpi_1^*), F_5^* = f_{f5}(\upsilon_1, \varpi_1^*))$$

6.1.A(6). Joint Minimization: GDP stability as policy objective

$$L_6 = \{a(y - \bar{y})^2 + (1 - a)(y^* - \bar{y}^*)^2\} \quad (0 \le a \le 1) \tag{35}$$

In this case, we assume that Malaysia and Thailand are agree to minimize the common loss function. The policy tool of Malaysia is υ_1, while the policy tool of Thailand is υ_2. Both countries minimize the common loss function using their own policy tool.

From the first order condition $\frac{\partial L_6}{\partial \upsilon_1} = 0$, we have

$$\upsilon_1 = -\frac{B_6 (b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + D_6 (\Delta e^{B/R} - \Delta \bar{e}^{B/R}) + F_6 (\Delta e^{R/\$} - \Delta \bar{e}^{R/\$})}{A_6 (b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + C_6 (\Delta e^{B/R} - \Delta \bar{e}^{B/R}) + E_6 (\Delta e^{R/\$} - \Delta \bar{e}^{R/\$})} \tag{48}$$

$$(B_6 = f_{b6}(\upsilon_2, a), D_6 = f_{d6}(\upsilon_2, a), F_6 = f_{f6}(\upsilon_2, a))$$

where $(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.})$, $(\Delta e - \Delta \bar{e})$, and $(\Delta e^{R/\$} - \Delta \bar{e}^{R/\$})$ show, respectively, the initial change of Malaysian bond holding by the R.O.W. residents, the induced increase in bahts-ringgit exchange rate risk and in ringgit-dollar exchange rate risk.

From the first order condition, $\frac{\partial L_6}{\partial \upsilon_2} = 0$, we have

$$\upsilon_2 = -\frac{B_6^*(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + D_6^*(\Delta e^{B/R} - \Delta \bar{e}^{B/R}) + F_6^*(\Delta e^{R/\$} - \Delta \bar{e}^{R/\$})}{A_6^*(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + C_6^*(\Delta e^{B/R} - \Delta \bar{e}^{B/R}) + E_6^*(\Delta e^{R/\$} - \Delta \bar{e}^{R/\$})} \tag{49}$$

$$(B_6^* = f_{b6}(\upsilon_1, a),\ D_6^* = f_{d6}(\upsilon_1, a),\ F_6^* = f_{f6}(\upsilon_1, a))$$

where $(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.})$, $(\Delta e^{B/R} - \Delta \bar{e}^{B/R})$, and $(\Delta e^{R/\$} - \Delta \bar{e}^{R/\$})$ show, respectively, the initial change of Malaysian bond holding by the R.O.W. residents, the induced increase in baht-ringgit exchange rate risk and in ringgit-dollar exchange rate risk.

6.1.A(7). Joint Minimization: current account stability as policy objective

$$L_6 = \{a(ca - \overline{ca})^2 + (1-a)(ca^* - \overline{ca}^*)^2\} \quad (0 \le a \le 1) \tag{36}$$

In this case, we assume that Malaysia and Thailand are agree to minimize the common loss function of the current account. The policy tool of Malaysia is υ_1, while the policy tool of Thailand is υ_2. Both countries minimize the common loss function using their own policy tool.

From the first order condition $\frac{\partial L_7}{\partial \upsilon_1} = 0$, we have

$$\upsilon_1 = -\frac{B_7(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + D_7(\Delta e^{B/R} - \Delta \bar{e}^{B/R}) + F_7(\Delta e^{R/\$} - \Delta \bar{e}^{R/\$})}{A_7(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + C_7(\Delta e^{B/R} - \Delta \bar{e}^{B/R}) + E_7(\Delta e^{R/\$} - \Delta \bar{e}^{R/\$})} \tag{50}$$

$$(B_7 = f_{b7}(\upsilon_2, a),\ D_7 = f_{d7}(\upsilon_2, a),\ F_7 = f_{f7}(\upsilon_2, a))$$

where $(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.})$, $(\Delta e^{B/R} - \Delta \bar{e}^{B/R})$, and $(\Delta e^{R/\$} - \Delta \bar{e}^{R/\$})$ show, respectively, the initial change of Malaysian bond holding by the R.O.W. residents, the induced increase in bahts-ringgit exchange rate risk and in ringgit-dollar exchange rate risk.

From the first order condition, $\frac{\partial L_7}{\partial \upsilon_2} = 0$, we have

$$\upsilon_2 = -\frac{B_7^*(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + D_7^*(\Delta e^{B/R} - \Delta \bar{e}^{B/R}) + F_7^*(\Delta e^{R/\$} - \Delta \bar{e}^{R/\$})}{A_7^*(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + C_7^*(\Delta e^{B/R} - \Delta \bar{e}^{B/R}) + E_7^*(\Delta e^{R/\$} - \Delta \bar{e}^{R/\$})} \tag{51}$$

$$(B_7^* = f_{b7}(\upsilon_1, a),\ D_7^* = f_{d7}(\upsilon_1, a),\ F_7^* = f_{f7}(\upsilon_1, a))$$

where $(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.})$, $(\Delta e^{B/R} - \Delta \bar{e}^{B/R})$, and $(\Delta e^{R/\$} - \Delta \bar{e}^{R/\$})$ show, respectively, the initial change of Malaysian bond holding by the R.O.W. residents, the induced increase in baht-ringgit exchange rate risk and in ringgit-dollar exchange rate risk.

6.1.B. Malaysia adopts the basket-peg and Thailand adopts the floating exchange rate regime

6.1.B(1). GDP stability as policy objectives

In a similar manner, we consider the case that only Malaysia adopts the basket-peg regime. Now we compare exchange rate regimes for each policy objectives. Consider the case where the Malaysian government wants to minimize fluctuations in GDP. The loss function which the authorities minimize is

$$L_{11} = (y - \bar{y})^2 \tag{26}$$

Their policy tool is μ.

$$L_{11} = (y - \bar{y})^2$$
$$= \left\{ \begin{array}{l} A_{11}\mu(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + B_{11}(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + C_{11}\mu(\Delta e^{B/R} - \Delta\bar{e}^{B/R}) \\ + D_{11}(\Delta e^{B/R} - \Delta\bar{e}^{B/R}) + E_{11}\mu(\Delta e^{R/\$} - \Delta\bar{e}^{R/\$}) + F_{11}(\Delta e^{R/\$} - \Delta\bar{e}^{R/\$}) \end{array} \right\}^2$$

From the first order condition $\frac{\partial L_{11}}{\partial \mu} = 0$, we have

$$\mu = -\frac{B_{11}(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + D_{11}(\Delta e^{B/R} - \Delta\bar{e}^{B/R}) + F_{11}(\Delta e^{R/\$} - \Delta\bar{e}^{R/\$})}{A_{11}(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + C_{11}(\Delta e^{B/R} - \Delta\bar{e}^{B/R}) + E_{11}(\Delta e^{R/\$} - \Delta\bar{e}^{R/\$})} \tag{52}$$

6.1.B(2). Current Account Stability as policy objectives

In this case, we assume that the Malaysian authority wants to stabilize the current account.

The objective function of Malaysia in this case is

$$L_{12} = (ca - \overline{ca})^2 \tag{28}$$

Their policy tool is υ_2.

$$L_{12} = (ca - \overline{ca})^2$$
$$= \left\{ \begin{array}{l} A_{12}\mu(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + B_{12}(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + C_{12}\mu(\Delta e^{B/R} - \Delta\bar{e}^{B/R}) \\ + D_{12}(\Delta e^{B/R} - \Delta\bar{e}^{B/R}) + E_{12}\mu(\Delta e^{R/\$} - \Delta\bar{e}^{R/\$}) + F_{12}(\Delta e^{R/\$} - \Delta\bar{e}^{R/\$}) \end{array} \right\}^2$$

From the first order condition, $\frac{\partial L_{12}}{\partial \mu} = 0$, we have

$$\mu = -\frac{B_{12}(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + D_{12}(\Delta e^{B/R} - \Delta\bar{e}^{B/R}) + F_{12}(\Delta e^{R/\$} - \Delta\bar{e}^{R/\$})}{A_{12}(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + C_{12}(\Delta e^{B/R} - \Delta\bar{e}^{B/R}) + E_{12}(\Delta e^{R/\$} - \Delta\bar{e}^{R/\$})} \tag{53}$$

6.1.B(3). Exchange rate stability as policy objectives

We assume that the policy goal is to stabilize the ringgit-dollar rate. The objective function is

$$L_{13} = (e^{R/\$} - \bar{e}^{R/\$})^2 \tag{30}$$

Evidently, the beast choice is the regime that fixes the ringgit-dollar rate at a constant level. Compared to the dollar peg regime, the basket peg regime is inferior unless the weight on the US dollar $(1-\mu)$ is set to 1. This is confirmed by solving the first-order condition $\frac{\partial L_{13}}{\partial \mu}=0$ for v_1, which gives us

$$v_1 = 0 \tag{54}$$

6.1.B(4). Price Level Stability as policy objectives

In this case, we assume that the Malaysian authority wants to minimize the price fluctuation.

The loss function can be defined as follow.

$$L_{14} = (p-\bar{p})^2 \tag{32}$$

Their policy tool is v_2.

$$L_{14}=(p-\bar{p})^2$$

$$=\left\{\begin{array}{l} A_{14}\mu(b_g^{R.O.W.}-\bar{b}_g^{R.O.W.})+B_{14}(b_g^{R.O.W.}-\bar{b}_g^{R.O.W.})+C_{14}\mu(\Delta e^{B/R}-\Delta\bar{e}^{B/R}) \\ +D_{14}(\Delta e^{B/R}-\Delta\bar{e}^{B/R})+E_{14}\mu(\Delta e^{R/\$}-\Delta\bar{e}^{R/\$})+E_{14}(\Delta e^{R/\$}-\Delta\bar{e}^{R/\$}) \end{array}\right\}^2$$

From the first order condition, $\frac{\partial L_{14}}{\partial \mu}=0$, we have

$$\mu = -\frac{B_{14}(b_g^{R.O.W.}-\bar{b}_g^{R.O.W.})+D_{14}(\Delta e^{B/R}-\Delta\bar{e}^{B/R})+F_{14}(\Delta e^{R/\$}-\Delta\bar{e}^{R/\$})}{A_{14}(b_g^{R.O.W.}-\bar{b}_g^{R.O.W.})+C_{14}(\Delta e^{B/R}-\Delta\bar{e}^{B/R})+E_{14}(\Delta e^{R/\$}-\Delta\bar{e}^{R/\$})} \tag{55}$$

6.2. Perfect Substitution between Malaysian bonds and Thailand bonds

6.2.A. Both Malaysia and Thailand individually adopt basket-peg regimes

6.2.A(1). GDP stability as policy objectives

First, we think about the case when the Malaysian authority wants to stabilize the GDP of Malaysia. The loss function is as follows.

$$L_1 = (y-\bar{y})^2 \tag{26}$$

The policy tool of Malaysia is v_1.

From the first order condition $\frac{\partial L_1}{\partial v_1}=0$, we have

$$v_1 = -\frac{B_1(b_g^{R.O.W.}-\bar{b}_g^{R.O.W.})+D_1(\Delta e^{B/R}-\Delta\bar{e}^{B/R})+F_1(\Delta e^{R/\$}-\Delta\bar{e}^{R/\$})}{A_1(b_g^{R.O.W.}-\bar{b}_g^{R.O.W.})+C_1(\Delta e^{B/R}-\Delta\bar{e}^{B/R})+E_1(\Delta e^{R/\$}-\Delta\bar{e}^{R/\$})} \tag{56}$$

where $B_1=f_{b1}(v_2)$, $D_1=f_{d1}(v_2)$, $F_1=f_{f1}(v_2)$ and $(b_g^{R.O.W.}-\bar{b}_g^{R.O.W.})$, $(\Delta e^{B/R}-\Delta\bar{e}^{B/R})$, and $(\Delta e^{R/\$}-\Delta\bar{e}^{R/\$})$ show, respectively, the initial change of Malaysian bond holding by the R.O.W. residents, the induced increase in bahts-ringgit exchange rate risk and in ringgit-dollar exchange rate risk.

Then we assume that the Thailand authority wants to minimize the fluctuation of the Thailand GDP.

The loss function can be defined as follow.

$$L_1^* = (y^*-\bar{y}^*)^2 \tag{27}$$

The policy tool of Thailand is the υ_2.

From the first order condition, $\frac{\partial L_1^*}{\partial \upsilon_2} = 0$, we have

$$\upsilon_2 = -\frac{B_1^*(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + D_1^*(\Delta e^{B/R} - \Delta\bar{e}^{B/R}) + F_1^*(\Delta e^{R/\$} - \Delta\bar{e}^{R/\$})}{A_1^*(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + C_1^*(\Delta e^{B/R} - \Delta\bar{e}^{B/R}) + E_1^*(\Delta e^{R/\$} - \Delta\bar{e}^{R/\$})} \tag{57}$$

$$(B_1^* = f_{b1}^*(\upsilon_1),\ D_1^* = f_{d1}^*(\upsilon_1),\ F_1^* = f_{f1}^*(\upsilon_1))$$

where $(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.})$, $(\Delta e^{B/R} - \Delta\bar{e}^{B/R})$, and $(\Delta e^{R/\$} - \Delta\bar{e}^{R/\$})$ show, respectively, the initial change of Malaysian bond holding by the R.O.W. residents, the induced increase in bahts-ringgit exchange rate risk and in ringgit-dollar exchange rate risk.

We conclude that the optimal values of the baskets in Malaysia and in Thailand are different also in the perfect substitution between the Malaysian bonds and Thai bonds.

6.2.A(2). Current Account Stability as policy objectives

We assume that Malaysia chooses current account stability as their policy objective. In that case, the objective function for the Malaysian authority is

$$L_2 = (ca - \overline{ca})^2 \tag{28}$$

From the first order condition $\frac{\partial L_2}{\partial \upsilon_1} = 0$, we have

$$\upsilon_1 = -\frac{B_2(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + D_2(\Delta e^{B/R} - \Delta\bar{e}^{B/R}) + F_2(\Delta e^{R/\$} - \Delta\bar{e}^{R/\$})}{A_2(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + C_2(\Delta e^{B/R} - \Delta\bar{e}^{B/R}) + E_2(\Delta e^{B/R} - \Delta\bar{e}^{B/R})} \tag{58}$$

$$(B_2 = f_{b2}(\upsilon_2),\ D_2 = f_{d2}(\upsilon_2),\ F_2 = f_{f2}(\upsilon_2))$$

where $(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.})$, $(\Delta e^{B/R} - \Delta\bar{e}^{B/R})$, and $(\Delta e^{R/\$} - \Delta\bar{e}^{R/\$})$ show, respectively, the initial change of Malaysian bond holding by the R.O.W. residents, the induced increase in bahts-ringgit exchange rate risk and in ringgit-dollar exchange rate risk.

On the other hand, we assume that the Thailand authority wants to minimize the fluctuation of the Thailand current account.

The objective function of Thailand can be defined as follows.

$$L_2^* = (ca^* - \overline{ca}^*)^2 \tag{29}$$

Their policy tool is υ_2.

From the first order condition, $\frac{\partial L_2^*}{\partial \upsilon_2} = 0$, we have

$$\upsilon_2 = -\frac{B_2^*(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + D_2^*(\Delta e^{B/R} - \Delta\bar{e}^{B/R}) + F_2^*(\Delta e^{R/\$} - \Delta\bar{e}^{R/\$})}{A_2^*(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + C_2^*(\Delta e^{B/R} - \Delta\bar{e}^{B/R}) + E_2^*(\Delta e^{R/\$} - \Delta\bar{e}^{R/\$})} \tag{59}$$

$$(B_2^* = f_{b2}^*(\upsilon_1),\ D_2^* = f_{d2}^*(\upsilon_1),\ F_2^* = f_{f2}^*(\upsilon_1))$$

where $(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.})$, $(\Delta e^{B/R} - \Delta\bar{e}^{B/R})$, and $(\Delta e^{R/\$} - \Delta\bar{e}^{R/\$})$ show, respectively, the initial change of Malaysian bond holding by the R.O.W. residents, the induced increase in bahts-ringgit exchange rate risk and in ringgit-dollar exchange rate risk.

6.2.A(3). Exchange rate stability as policy objectives

We assume that the policy goal of Malaysian authority is to stabilize the ringgit-dollar rate. The objective function of the Malaysian authority is

$$L_3 = (e^{R/\$} - \bar{e}^{R/\$})^2 \tag{30}$$

Evidently, the beast choice is the regime that fixes the ringgit-dollar rate at a constant level. Compared to the dollar peg regime, the basket peg regime is inferior unless the weight on the US dollar $(1 - \upsilon_1)$ is set to 1. This is confirmed by solving the first-order condition $\frac{\partial L_3}{\partial \upsilon_1} = 0$ for υ_1, which gives us

$$\upsilon_1 = 0 \tag{60}$$

On the other hand, we assume that the policy goal of Thai authority is to stabilize the baht-dollar rate. The objective function of Thai authority is

$$L_3^* = (e^{B/S} - \bar{e}^{B/\$})^2 \tag{31}$$

Evidently, the best choice is the regime that fixes the bats-dollar rate at a constant level. Compared to the dollar peg regime, the basket peg regime is inferior unless the weight on the US dollar $(1-\upsilon_2)$ is set to 1. This is confirmed by solving the first-order condition $\frac{\partial L_3^*}{\partial \upsilon_2} = 0$ for υ_1, which gives us

$$\upsilon_2 = 0 \tag{61}$$

6.2.A(4). Price Level Stability as policy objectives

We assume that the policy goal is to stabilize price. The objective function is

$$L_4 = (p - \bar{p})^2 \tag{32}$$

Their policy objective is υ_1.

From the first order condition $\frac{\partial L_4}{\partial \upsilon_1} = 0$, we have

$$\upsilon_1 = -\frac{B_4(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + D_4(\Delta e^{B/R} - \Delta\bar{e}^{B/R}) + F_4(\Delta e^{R/\$} - \Delta\bar{e}^{R/\$})}{A_4(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + C_4(\Delta e^{B/R} - \Delta\bar{e}^{B/R}) + E_4(\Delta e^{R/\$} - \Delta\bar{e}^{R/\$})} \tag{62}$$

$$(B_4 = f_{b4}(\upsilon_2),\ D_4 = f_{d4}(\upsilon_2),\ F_4 = f_{f4}(\upsilon_2))$$

where $(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.})$, $(\Delta e^{B/R} - \Delta\bar{e}^{B/R})$, and $(\Delta e^{R/\$} - \Delta\bar{e}^{R/\$})$ show, respectively, the initial change of Malaysian bond holding by the R.O.W. residents, the induced increase in baht-ringgit exchange rate risk and in ringgit-dollar exchange rate risk.

On the other hand, we assume that the policy goal of Thai authority is to stabilize price level. The objective function of the Thai authority is

$$L_4^* = (p^* - \bar{p}^*)^2 \tag{33}$$

Their policy objective is υ_2.

From the first order condition $\frac{\partial L_4^*}{\partial \upsilon_2} = 0$, we have

$$\upsilon_2 = -\frac{B_4^*(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + D_4^*(\Delta e^{B/R} - \Delta\bar{e}^{B/R}) + F_4^*(\Delta e^{R/\$} - \Delta\bar{e}^{R/\$})}{A_4^*(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + C_4^*(\Delta e^{B/R} - \Delta\bar{e}^{B/R}) + E_4^*(\Delta e^{R/\$} - \Delta\bar{e}^{R/\$})} \tag{63}$$

$$(B_4^* = f_{b4}(\upsilon_1),\ D_4^* = f_{d4}(\upsilon_1),\ F_4^* = f_{f4}(\upsilon_1))$$

where $(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.})$, $(\Delta e^{B/R} - \Delta\bar{e}^{B/R})$, and $(\Delta e^{R/\$} - \Delta\bar{e}^{R/\$})$ show, respectively, the initial change of Malaysian bond holding by the R.O.W. residents, the induced increase in baht-ringgit exchange rate risk and in ringgit-dollar exchange rate risk.

6.2.A(5). GDP and Price level stability as policy objectives

We assume that the policy goal of the Malaysian authority is to stabilize GDP and price level. The objective function of the Malaysian authority is

$$L_5 = \{(y - \bar{y})^2 + \varpi_1(p - \bar{p})^2\} \tag{34}$$

Their policy objective is υ_1.

$$L_5 = \{(y - \bar{y})^2 + \varpi_1(p - \bar{p})^2\}$$
$$= \left\{\begin{array}{l} A_5\upsilon_1(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + B_5(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + C_5\upsilon_1(\Delta e^{B/R} - \Delta\bar{e}^{B/R}) \\ \quad + D_5(\Delta e^{B/R} - \Delta\bar{e}^{B/R}) + E_5\upsilon_1(\Delta e^{R/\$} - \Delta\bar{e}^{R/\$}) + F_5(\Delta e^{R/\$} - \Delta\bar{e}^{R/\$}) \end{array}\right\}^2$$

From the first order condition $\frac{\partial L_5}{\partial \upsilon_1} = 0$, we have

$$\upsilon_1 = -\frac{B_5(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + D_5(\Delta e^{B/R} - \Delta\bar{e}^{B/R}) + F_5(\Delta e^{R/\$} - \Delta\bar{e}^{R/\$})}{A_5(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + C_5(\Delta e^{B/R} - \Delta\bar{e}^{B/R}) + E_5(\Delta e^{R/\$} - \Delta\bar{e}^{R/\$})} \tag{64}$$

$$(B_5 = f_{b5}(\upsilon_2, \varpi_1),\ D_5 = f_{d5}(\upsilon_2, \varpi_1),\ F_5 = f_{f5}(\upsilon_2, \varpi_1))$$

where $(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.})$, $(\Delta e^{B/R} - \Delta\bar{e}^{B/R})$, and $(\Delta e^{R/\$} - \Delta\bar{e}^{R/\$})$ show, respectively, the initial change of Malaysian bond holding by the R.O.W. residents, the induced increase in baht-ringgit exchange rate risk and in ringgit-dollar exchange rate risk.

At the same time, we assume that the policy goal of Thai authority is to stabilize GDP and price level. The objective function of the Thai authority is

$$L_5^* = \{(y^* - \bar{y}^*)^2 + \varpi_1^*(p - \bar{p}^*)^2\} \tag{35}$$

Their policy objective is υ_2.

$$L_5^* = \{(y^* - \bar{y}^*)^2 + \varpi_1^*(p^* - \bar{p}^*)^2\}$$
$$= \left\{\begin{array}{l} A_5^*\upsilon_2(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + B_5^*(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + C_5^*\upsilon_2(\Delta e^{B/R} - \Delta\bar{e}^{B/R}) \\ \quad + D_5^*(\Delta e^{B/R} - \Delta\bar{e}^{B/R}) + E_5^*\upsilon_2(\Delta e^{R/\$} - \Delta\bar{e}^{R/\$}) + F_5^*(\Delta e^{R/\$} - \Delta\bar{e}^{R/\$}) \end{array}\right\}^2$$

From the first order condition $\frac{\partial L_5^*}{\partial \upsilon_2} = 0$, we have

$$\upsilon_2 = -\frac{B_5^*(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + D_5^*(\Delta e^{B/R} - \Delta\bar{e}^{B/R}) + F_5^*(\Delta e^{R/\$} - \Delta\bar{e}^{R/\$})}{A_5^*(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + C_5^*(\Delta e^{B/R} - \Delta\bar{e}^{B/R}) + E_5^*(\Delta e^{R/\$} - \Delta\bar{e}^{R/\$})} \tag{65}$$

$$(B_5^* = f_{b5}(\upsilon_1, \varpi_1^*),\ D_5^* = f_{d5}(\upsilon_1, \varpi_1^*),\ F_5^* = f_{f5}(\upsilon_1, \varpi_1^*))$$

where $(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.})$, $(\Delta e^{B/R} - \Delta\bar{e}^{B/R})$, and $(\Delta e^{R/\$} - \Delta\bar{e}^{R/\$})$ show, respectively, the initial change of Malaysian bond holding by the R.O.W. residents, the induced increase in baht-ringgit exchange rate risk and in ringgit-dollar exchange rate risk.

6.2.A(6). Joint Minimization: GDP Stability as policy objective

$$L_6 = \{a(y - \bar{y})^2 + (1 - a)(y^* - \bar{y}^*)^2\} \quad (0 \leq a \leq 1) \tag{36}$$

In this case, we assume that Malaysia and Thailand are agree to minimize the common loss function. The policy tool of Malaysia is υ_1, while the policy tool of Thailand is υ_2. Both countries minimize the common loss function using their own policy tool.

From the first order condition $\frac{\partial L_6}{\partial \upsilon_1} = 0$, we have

$$\upsilon_1 = -\frac{B_6(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + D_6(\Delta e^{B/R} - \Delta\bar{e}^{B/R}) + F_6(\Delta e^{R/\$} - \Delta\bar{e}^{R/\$})}{A_6(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + C_6(\Delta e^{B/R} - \Delta\bar{e}^{B/R}) + E_6(\Delta e^{R/\$} - \Delta\bar{e}^{R/\$})} \tag{66}$$

$$(B_6 = f_{b6}(\upsilon_2, a),\ D_6 = f_{d6}(\upsilon_2, a),\ F_6 = f_{f6}(\upsilon_2, a))$$

where $(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.})$, $(\Delta e - \Delta\bar{e})$, and $(\Delta e^{R/\$} - \Delta\bar{e}^{R/\$})$ show, respectively, the initial change of Malaysian bond holding by the R.O.W. residents, the induced increase in bahts-ringgit exchange rate risk and in ringgit-dollar exchange rate risk.

From the first order condition, $\frac{\partial L_6}{\partial \upsilon_2} = 0$, we have

$$\upsilon_2 = -\frac{B_6^*(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + D_6^*(\Delta e^{B/R} - \Delta\bar{e}^{B/R}) + F_6^*(\Delta e^{R/\$} - \Delta\bar{e}^{R/\$})}{A_6^*(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + C_6^*(\Delta e^{B/R} - \Delta\bar{e}^{B/R}) + E_6^*(\Delta e^{R/\$} - \Delta\bar{e}^{R/\$})} \tag{67}$$

$$(B_6^* = f_{b6}(\upsilon_1, a),\ D_6^* = f_{d6}(\upsilon_1, a),\ F_6^* = f_{f6}(\upsilon_1, a))$$

where $(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.})$, $(\Delta e^{B/R} - \Delta\bar{e}^{B/R})$, and $(\Delta e^{R/\$} - \Delta\bar{e}^{R/\$})$ show, respectively, the initial change of Malaysian bond holding by the R.O.W. residents, the induced increase in baht-ringgit exchange rate risk and in ringgit-dollar exchange rate risk.

6.2.A(7). Joint Minimization: current account stability as policy objective

$$L_7 = \{a(ca - \overline{ca})^2 + (1 - a)(ca^* - \overline{ca}^*)^2\} \quad (0 \leq a \leq 1) \tag{37}$$

In this case, we assume that Malaysia and Thailand are agree to minimize the common loss function of the current account. The policy tool of Malaysia is υ_1, while the policy tool of Thailand is υ_2. Both countries minimize the common loss function using their own policy tool.

From the first order condition $\frac{\partial L_7}{\partial \upsilon_1} = 0$, we have

$$v_1 = -\frac{B_7(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + D_7(\Delta e^{B/R} - \Delta\bar{e}^{B/R}) + F_7(\Delta e^{R/\$} - \Delta\bar{e}^{R/\$})}{A_7(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + C_7(\Delta e^{B/R} - \Delta\bar{e}^{B/R}) + E_7(\Delta e^{R/\$} - \Delta\bar{e}^{R/\$})} \tag{68}$$

$$(B_7 = f_{b7}(v_2, a), D_7 = f_{d7}(v_2, a), F_7 = f_{f7}(v_2, a))$$

where $(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.})$, $(\Delta e^{B/R} - \Delta\bar{e}^{B/R})$, and $(\Delta e^{R/\$} - \Delta\bar{e}^{R/\$})$ show, respectively, the initial change of Malaysian bond holding by the R.O.W. residents, the induced increase in bahts-ringgit exchange rate risk and in ringgit-dollar exchange rate risk.

From the first order condition, $\frac{\partial L_7}{\partial v_2} = 0$, we have

$$v_2 = -\frac{B_7^*(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + D_7^*(\Delta e^{B/R} - \Delta\bar{e}^{B/R}) + F_7^*(\Delta e^{R/\$} - \Delta\bar{e}^{R/\$})}{A_7^*(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + C_7^*(\Delta e^{B/R} - \Delta\bar{e}^{B/R}) + E_7^*(\Delta e^{R/\$} - \Delta\bar{e}^{R/\$})} \tag{69}$$

$$(B_7^* = f_{b7}(v_1, a), D_7^* = f_{d7}(v_1, a), F_7^* = f_{f7}(v_1, a))$$

where $(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.})$, $(\Delta e^{B/R} - \Delta\bar{e}^{B/R})$, and $(\Delta e^{R/\$} - \Delta\bar{e}^{R/\$})$ show, respectively, the initial change of Malaysian bond holding by the R.O.W. residents, the induced increase in baht-ringgit exchange rate risk and in ringgit-dollar exchange rate risk.

6.2.B. Malaysia adopts the basket-peg and Thailand adopts the floating exchange rate regime

6.2.B(1). GDP Stability as policy objectives

In a similar manner, we consider the case that only Malaysia adopts the basket-peg regime. Now we compare exchange rate regimes for each policy objectives. Consider the case where the Malaysian government wants to minimize fluctuations in GDP. The loss function which the authorities minimize is

$$L_{11} = (y - \bar{y})^2 \tag{26}$$

Their policy tool is μ.

$$L_{11} = (y - \bar{y})^2$$
$$= \left\{ \begin{array}{l} A_{11}\mu(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + B_{11}(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + C_{11}\mu(\Delta e^{B/R} - \Delta\bar{e}^{B/R}) \\ +D_{11}(\Delta e^{B/R} - \Delta\bar{e}^{B/R}) + E_{11}\mu(\Delta e^{R/\$} - \Delta\bar{e}^{R/\$}) + F_{11}(\Delta e^{R/\$} - \Delta\bar{e}^{R/\$}) \end{array} \right\}^2$$

From the first order condition $\frac{\partial L_{11}}{\partial \mu} = 0$, we have

$$\mu = -\frac{B_{11}(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + D_{11}(\Delta e^{B/R} - \Delta\bar{e}^{B/R}) + F_{11}(\Delta e^{R/\$} - \Delta\bar{e}^{R/\$})}{A_{11}(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + C_{11}(\Delta e^{B/R} - \Delta\bar{e}^{B/R}) + E_{11}(\Delta e^{R/\$} - \Delta\bar{e}^{R/\$})} \tag{70}$$

6.2.B(2). Current Account Stability as policy objectives

In this case, we assume that the Malaysian authority wants to stabilize the current account.

The objective function of Malaysia in this case is

$$L_{12} = (ca - \overline{ca})^2 \tag{28}$$

Their policy tool is υ_2.

$L_{12} = (ca - \overline{ca})^2$

$$= \left\{ \begin{array}{l} A_{12}\mu(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + B_{12}(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + C_{12}\mu(\Delta e^{B/R} - \Delta\bar{e}^{B/R}) \\ +D_{12}(\Delta e^{B/R} - \Delta\bar{e}^{B/R}) + E_{12}\mu(\Delta e^{R/\$} - \Delta\bar{e}^{R/\$}) + F_{12}(\Delta e^{R/\$} - \Delta\bar{e}^{R/\$}) \end{array} \right\}^2$$

From the first order condition, $\frac{\partial L_{12}}{\partial \mu} = 0$, we have

$$\mu = -\frac{B_{12}(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + D_{12}(\Delta e^{B/R} - \Delta\bar{e}^{B/R}) + F_{12}(\Delta e^{R/\$} - \Delta\bar{e}^{R/\$})}{A_{12}(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + C_{12}(\Delta e^{B/R} - \Delta\bar{e}^{B/R}) + E_{12}(\Delta e^{R/\$} - \Delta\bar{e}^{R/\$})} \tag{71}$$

6.2.B(3). Exchange rate stability as policy objectives

We assume that the policy goal is to stabilize the ringgit-dollar rate. The objective function is

$$L_{13} = (e^{R/\$} - \bar{e}^{R/\$})^2 \tag{30}$$

Evidently, the beast choice is the regime that fixes the ringgit-dollar rate at a constant level. Compared to the dollar peg regime. the basket peg regime is inferior unless the weight on the US dollar $(1 - \mu)$ is set to 1. This is confirmed by solving the first-order condition $\frac{\partial L_{13}}{\partial \mu} = 0$ for , which gives us

$$\upsilon_1 = 0 \tag{72}$$

6.2.B(4). Price Level Stability as policy objectives

In this case, we assume that the Malaysian authority wants to minimize the price fluctuation.

The loss function can be defined as follow.

$$L_{14} = (p - \bar{p})^2 \tag{32}$$

Their policy tool is υ_2.

$L_{14} = (p - \bar{p})^2$

$$= \left\{ \begin{array}{l} A_{14}\mu(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + B_{14}(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + C_{14}\mu(\Delta e^{B/R} - \Delta\bar{e}^{B/R}) \\ +D_{14}(\Delta e^{B/R} - \Delta\bar{e}^{B/R}) + E_{14}\mu(\Delta e^{R/\$} - \Delta\bar{e}^{R/\$}) + F_{14}(\Delta e^{R/\$} - \Delta\bar{e}^{R/\$}) \end{array} \right\}^2$$

From the first order condition. $\frac{\partial L_{14}}{\partial \mu} = 0$, we have

$$\mu = -\frac{B_{14}(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + D_{14}(\Delta e^{B/R} - \Delta\bar{e}^{B/R}) + F_{14}(\Delta e^{R/\$} - \Delta\bar{e}^{R/\$})}{A_{14}(b_g^{R.O.W.} - \bar{b}_g^{R.O.W.}) + C_{14}(\Delta e^{B/R} - \Delta\bar{e}^{B/R}) + E_{14}(\Delta e^{R/\$} - \Delta\bar{e}^{R/\$})} \tag{73}$$

7. EMPIRICAL ANALYSIS USING DATA FOR MALAYSIA AND THAILAND

We use annual data for Malaysia and Thailand from 1980 to 2002 from International Financial Statistics (IFS), and the Instrumental Variables Method to estimate the equations in the theoretical part of our paper.

The results are shown in the Appendix. Because the endogenous and exogenous variables are different according to whether two countries adopt the fixed or floating exchange rates, we have four sets of results. They are ① Malaysia and Thailand both adopt the fixed exchange rate regime, ② Malaysia adopts the fixed exchange rate regime and Thailand adopts floating exchange rate regime. ③ Malaysia adopts the floating exchange rate regime and Thailand adopts the fixed exchange rate regime, ④ Malaysia and Thailand both adopts floating exchange rate regime

The functions we estimated are the consumption function, the investment function, the demand function for money, the demand function for the domestic bonds, the demand function for the foreign bonds, the demand function, the export function (to the counter-part and to the USA), the import functions (to the counter-part and to the USA), and aggregate supply function. The first column of the table shows the explanatory variables. The second column shows the coefficients, the third column the t-value. Two asterisks on the t-values indicate the level of 1% significance and one asterisk indicates 5% significance. For exchange risk, we used the variance of monthly exchange rate data as proxy.

7.1. Imperfect Substitution between Malaysian bonds and Thai bonds

7.1.A. Both Malaysia and Thailand individually adopt Basket-peg Regimes

Using the estimated coefficients, we calculated the basket weights that minimize the loss functions corresponding to the different policy goals.

7.1.A(1). GDP stability as policy objectives

$$L = (y - \bar{y})^2 = (0.0052\upsilon_1 - 0.0022\upsilon_2 - 0.0015)^2$$

$$\frac{\partial L}{\partial \upsilon_1} = 0 \;\Rightarrow\; \upsilon_1 = -0.423\upsilon_2 + 0.2885 \tag{74}$$

$$L^* = (y^* - \bar{y}^*)^2 = (-0.0474\upsilon_1 - 0.0087\upsilon_2 - 0.0214)^2$$

$$\frac{\partial L^*}{\partial \upsilon_2} = 0 \;\Rightarrow\; \upsilon_2 = -5.4483\upsilon_1 - 2.4598 \tag{75}$$

Solve the equation (74) and (75) simultaneously, with the constraints of basket weights, we obtain

$$\upsilon_1 = 1.02 \tag{76}$$

$$\upsilon_2 = 3.09 \tag{77}$$

7.1.A(2). Current Account stability as policy objectives

$$L = (ca - \overline{ca})^2 = (-2.2477\upsilon_1 - 0.5576\upsilon_2 - 0.5646)^2$$

$$\frac{\partial L}{\partial \upsilon_1} = 0 \;\Rightarrow\; \upsilon_1 = 0.2481\upsilon_2 - 0.2512 \tag{78}$$

$$L = (ca^* - \overline{ca}^*)^2 = (-1.9412\upsilon_1 - 0.4817\upsilon_2 - 0.4507)^2$$

$$\frac{\partial L^*}{\partial \upsilon_2} = 0 \;\Rightarrow\; \upsilon_2 = -4.0299\upsilon_1 - 0.9356 \tag{79}$$

Solve the equation (78) and (79) simultaneously, we obtain

$$\upsilon_1 = -0.24^{16} \tag{80}$$

$$\upsilon_2 = 0.04 \tag{81}$$

7.1.A(3). Exchange rate stability as policy objectives

Obviously, if the stability of the exchange rate against the dollar is the policy goal, the optimal weight on the exchange rate against the dollar is one for both Malaysia and Thailand.

7.1.A(4). Price level stability as policy objectives

$$L = (p - \bar{p})^2 = (-0.0025\upsilon_1 - 0.0012\upsilon_2 + 0.0010)^2$$

$$\frac{\partial L}{\partial \upsilon_1} = 0 \;\Rightarrow\; \upsilon_1 = -0.48\upsilon_2 + 0.4 \tag{82}$$

$$L^* = (p^* - \bar{p}^*)^2 = (-0.0362\upsilon_1 - 0.0106\upsilon_2 - 0.0044)^2$$

$$\frac{\partial L^*}{\partial \upsilon_2} = 0 \;\Rightarrow\; \upsilon_2 = 3.4151\upsilon_1 - 0.4151 \tag{83}$$

Solve the equation (82) and (83) simultaneously, with the constraints of basket weights, we obtain

$$\upsilon_1 = 0.23 \tag{84}$$

$$\upsilon_2 = 0.36 \tag{85}$$

7.1.A(5). GDP and Price Level Stability as policy objectives

[16] The negative weights of basket are still desirable. Substituting the optimal weights as equation (80) and (81) into equation (15), we obtain

$$\frac{1}{2}(-0.20)e^{B/R} + \frac{1}{2}(1.24)e^{R/\$} + \frac{1}{2}(0.96)e^{B/\$} = \beta\,,$$

it can be rewritten as

$$(0.10)e^{R/B} + (0.62)e^{R/\$} + (0.48)e^{B/\$} = \beta\,,$$

using the exchange rate equation (13)

$$(0.10)(e^{R/\$} - e^{B/\$}) + (0.62)e^{R/\$} + (0.48)e^{B/\$} = \beta$$

$$(0.72)e^{R/\$} - (0.38)e^{R/\$} = \beta$$

Therefore, the negative weights of the basket still maintain equation (15) and desirable.

$$L = \{(y-\bar{y})^2 + \varpi_1(p-\bar{p})^2\} = \left\{ \begin{array}{l} (0.0052\upsilon_1 - 0.0022\upsilon_2 - 0.0015)^2 \\ +\varpi_1(-0.0025\upsilon_1 - 0.0012\upsilon_2 + 0.001)^2 \end{array} \right\}$$

$$\frac{\partial L}{\partial \upsilon_1} = 0 \;\Rightarrow\; \upsilon_1 = \frac{(-0.03\varpi_1 + 0.1144)}{(0.0625\varpi_1 + 0.2704)}\upsilon_2 + \frac{(0.25\varpi_1 + 0.0078)}{(0.0625\varpi_1 + 0.2704)} \tag{86}$$

$$L = \{(y^*-\bar{y}^*)^2 + \varpi_1^*(p^*-\bar{p}^*)^2\} = \left\{ \begin{array}{l} (-0.0474\upsilon_1 - 0.0087\upsilon_2 - 0.0214)^2 \\ +\varpi_1^*(-0.0362\upsilon_1 - 0.0106\upsilon_2 - 0.0044)^2 \end{array} \right\}$$

$$\frac{\partial L}{\partial \upsilon_2} = 0 \;\Rightarrow\; \upsilon_2 = -\frac{(3.8372\varpi_1^* + 4.1238)}{(1.1236\varpi_1^* + 0.7569)}\upsilon_2 - \frac{(0.4664\varpi_1 + 1.8618)}{(1.1236\varpi_1 + 0.7569)} \tag{87}$$

7.1.A(6). Joint Minimization: GDP Stability as policy objectives

$$L = \{a(y-\bar{y})^2 + (1-a)(y^*-\bar{y}^*)^2\}, \quad (0 \le a \le 1)$$

$$\frac{\partial L}{\partial \upsilon_1} = 0 \;\Rightarrow\; \upsilon_1 = -\frac{(-0.0004a + 0.0004)}{(-0.0022a + 0.0022)}\upsilon_2 - \frac{(-0.001a + 0.001)}{(-0.0022a + 0.0022)} \tag{88}$$

$$\frac{\partial L}{\partial \upsilon_2} = 0 \;\Rightarrow\; \upsilon_2 = -\frac{(-0.0004a + 0.0004)}{(-0.00008a + 0.0008)}\upsilon_1 - \frac{(-0.0019 + 0.0019)}{(-0.0008a + 0.00008)} \tag{89}$$

7.1.A(7). Joint Minimization: current account stability as policy objectives

$$L = \{a(ca-\overline{ca})^2 + (1-a)(ca^*-\overline{ca}^*)^2\}, \quad (0 \le a \le 1)$$

$$\frac{\partial L}{\partial \upsilon_1} = 0 \;\Rightarrow\; \upsilon_1 = -\frac{(0.3183a + 0.9351)}{(1.2929a + 3.7683)}\upsilon_2 - \frac{(0.3943a + 0.8749)}{(1.2929a + 3.7683)} \tag{90}$$

$$\frac{\partial L}{\partial \upsilon_2} = 0 \;\Rightarrow\; \upsilon_2 = -\frac{(0.3183a + 0.9351)}{(0.0789a + 0.232)}\upsilon_1 - \frac{(0.0977 + 0.2171)}{(0.0789a + 0.232)} \tag{91}$$

7.1.B. Malaysia adopts the basket-peg and Thailand adopts the floating exchange rate regime

7.1.B(1). GDP stability as policy objectives

$$L = (y-\bar{y})^2 = (0.0054\mu - 0.0023)^2$$

$$\frac{\partial L}{\partial \mu} = 0 \;\Rightarrow\; \mu = 0.43 \tag{92}$$

7.1.B(2). Current account stability as policy objectives

$$L = (ca-\overline{ca})^2 = (-2.6645\mu - 0.1554)^2$$

$$\frac{\partial L}{\partial \mu} = 0 \;\Rightarrow\; \mu = -0.06 \tag{93}$$

7.1.B(3). Exchange rate stability as policy objectives

Obviously, if the stability of the exchange rate against the dollar is the policy goal, the optimal weight on the exchange rate against the dollar is one for both Malaysia and Thailand.

Table 2. The comparison of the loss.

The Value of Loss				
Policy Objective	Malaysia–basket peg Thailand–basket peg with both adopting optimal weights	Malaysia–basket peg Thailand–basket peg with both adopting common weights (1)	Malaysia–basket peg Thailand–basket peg with both adopting common weights (2)	Malaysis–basket peg Thailand–basket peg with both adopting trade weights*
GDP	$v_1=1.02$ $v_2=3.09$	$v_1=1.02$ $v_2=1.02$	$v_1=3.09$ $v_2=3.09$	$v_1=0.04$ (0.17) $v_2=0.05$ (0.25)
	(M) 0 (T) 0	(M) 0 (T) $(0.0786)^2$	(M) $(0.0078)^2$ (T) 0	(M) $(0.0014)^2$ (T) $(0.0237)^2$
Current Account	$v_1=-0.24$ $v_2=0.04$	$v_1=-0.24$ $v_2=-0.24$	$v_1=0.04$ $v_2=0.04$	$v_1=0.04$ (0.17) $v_2=0.05$ (0.25)
	(M) 0 (T) 0	(M) 0 (T) $(0.1307)^2$	(M) $(0.6778)^2$ (T) 0	(M) $(0.6824)^2$ (T) $(0.5524)^2$
Ringgit-dollar or Baht-dollar exchange rate	$v_1=0$ $v_2=9$	$v_1=0$ $v_2=0$	$v_1=0$ $v_2=0$	$v_1=0.04$ (0.17) $v_2=0.05$ (0.25)
	(M) 0 (T) 0	(M) 0 (T) 0	(M) 0 (T) 0	(M) $(0.0219)^2$ (T) $(0.0248)^2$
Price level	$v_1=0.23$ $v_2=0.36$	$v_1=0.23$ $v_2=0.23$	$v_1=0.36$ $v_2=0.36$	$v_1=0.04$ (0.17) $v_2=0.05$ (0.25)
	(M) 0 (T) 0	(M) 0 (T) $(0.0616)^2$	(M) $(0.0003)^2$ (T) 0	(M) $(0.0008)^2$ (T) $(0.0063)^2$

*: We define the trade weight as a share of bilateral gross trade (export+import) to the parter country over the total trade (export+import)

The Value of Loss				
Policy Objective	Malaysia–basket peg wigh optimal weight Thailand–floating	Malaysia–basket peg wigh trade weight Thailand–floating	Malaysia–basket peg Thailand–floating with optimal monetary policy	Malaysis–basket peg Thailand–floating
GDP	$\mu=0.43$ (M) 0 (T) 0	$\mu=0.04$ (M) $(0.0023)^2$ (T) 0	(M) 0 (T) 0	(M) $(0.6286)^2$ (T) 0
Current Account	$\mu=-0.06$ (M) 0 (T) 0	$\mu=0.04$ (M) $(0.262)^2$ (T) 0	(M) 0 (T) 0	(M) $(0.5477)^2$ (T) 0
Ringgit-dollar or Baht-dollar exchange rate	$\mu=0$ (M) 0 (T) 0	$\mu=0.04$ (M) $(0.0045)^2$ (T) 0	(M) 0 (T) 0	(M) 0 (T) 0
Price level	$\mu=0.09$ (M) 0 (T) 0	$\mu=0.04$ (M) $(0.0007)^2$ (T) 0	(M) 0 (T) 0	(M) $(0.0221)^2$ (T) 0

7.1.B(4). Price level stability as policy objectives

$$L = (p - \bar{p})^2 = (-0.0135\mu + 0.0012)^2$$

$$\frac{\partial L}{\partial \mu} = 0 \;\Rightarrow\; \mu = 0.09 \tag{94}$$

Also by using the estimated coefficients, we compared the values of loss functions under the basket peg, floating and the dollar-peg regimes in Table 2[17]. For the basket-peg, we consider four cases, both countries adopting optimal weights individually, both countries adopting the common weights (Case (1) is both countries adopting the common weights, which is optimal for Malaysia, and case (2) is both countries adopting the common weights, which is optimal for Thailand), and lastly both countries adopting trade weights[18].

As expected, if both countries adopt the common weights, the values of the loss functions will be higher compared with the case where both adopt their respective optimal weights. Under the case in which Malaysia adopts the dollar peg and Thailand adopts floating, the loss for Malaysia will be high. On the other hand, if both Malaysia and Thailand adopt the floating exchange rate regime, their losses will be zero. However, as pointed out in Yoshino, Kaji, and Ibuka (2004), too much fluctuation of the exchange rate can hurt a small country where trade as a percentage of GDP is high.

8. CONCLUSION

In this paper, we used a two-country model with the exogenous Rest of the World to examine which exchange rate regimes would be optimal for East Asia. We also calculated the optimal weights on the different exchange rates in the baskets.

Our most important finding is that, contrary to suggestions made by some economists, it is not optimal for both countries to adopt a common basket to peg their currencies to, when they adopt basket-peg regimes. The optimal weights in the currency basket are different, because the structure of the goods and money markets are different. We have three other findings. One is that adopting a dollar-peg regime is not optimal in East Asia. Second, a floating exchange rate regime with optimal monetary policy is one of the ways to minimize the loss. However as pointed out in Yoshino, Kaji, and Ibuka (2004), too much fluctuation of the exchange rates would hurt a small open country whose share of trade in GDP is high. Third, the optimal weights in the basket depend on whether the foreign country also adopts a basket peg regime. This means that the optimal weight of the basket is different under the case where both Malaysia and Thailand adopt basket-peg regime and under the case where only Malaysia adopts a basket-peg regime.

[17] In the empirical analysis, we omitted the indirect effect of the induced expectation for devaluation under the dollar-peg regime for lack of adequate data.

[18] We define the trade weight as a share of bilateral gross trade (export + import) to the partner over the total trade (export+import).

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APPENDIX

Consumption—Malaysia

Consumptiion (log)(RCONSM)	M-peg, T-peg		M-peg, T-float		M-float, T-peg		M-float, T-float	
variable	Est. Value	t-value	Est. Value	t-value	Est. Value	t-value	Est. Value	t-value
constant ©	0.3428	(2.3268)*	0.3428	(2.3268)*	0.3428	(2.3266)*	0.3428	(2.3267)*
Real GDP M (log)(RGDPM)	0.8547	(42.8116)**	0.8547	(42.8118)**	0.8547	(42.8084)**	0.8547	(42.8112)**
R-squared								
Durbin-Watson	0.7719		0.7719		0.7719		0.7719	

Consumption—Thailand

Consumptiion (log)(RCONST)	M-peg, T-peg		M-peg, T-float		M-float, T-peg		M-float, T-float	
variable	Est. Value	t-value	Est. Value	t-value	Est. Value	t-value	Est. Value	t-value
constant ©	0.9314	(7.1786)**	0.9304	(7.1702)**	0.9276	(7.1442)**	0.9276	(7.1461)**
GDP T (log)(RGDPT)	0.8548	(67.0944)**	0.8549	(67.0960)**	0.8551	(67.0825)**	0.8551	(67.0999)**
R-squared								
Durbin-Watson	0.481		0.481		0.4809		0.4809	

Investment—Malaysia

Investment (log)(RINVM)	M-peg, T-peg		M peg, T-float		M-float, T-peg		M float, T-float	
variable	Est. Value	t-value	Est. Value	t-value	Est. Value	t-value	Est. Value	t-value
constant ©	−1.9867	1.0662	−1.9196	−1.8316	−1.8791	−1.8098	−1.8651	−1.8031
Real GDP M (log)(RGDPM)	1.0536	(8.7749)**	1.05405	(8.8100)**	1.0454	(8.8214)**	1.0442	(8.8295)**
Money Market rate M (RIM)	0.0507	1.3838	0.0454	1.339	0.04525	1.3073	0.0446	1.2979
R-squared								
Durbin-Watson	0.4755		0.4709		0.4679		0.467	

Investment—Thailand

Investment (log)(RINVC)	M-peg, T-peg		M-peg, T-float		M-float, T-peg		M-float, T-float	
variable	Est. Value	t-value	Est. Value	t-value	Est. Value	t-value	Est. Value	t-value
constant ©	−6.183	(−3.8649)**	−5.9068	(−3.7546)**	−5.6466	(−3.6852)**	−5.6335	(−3.6854)**
Real GDP T (log)(RGDPT)	1.405	(10.2462)**	1.3834	(10.2409)**	1.3634	(10.3116)**	1.3622	(10.3255)**
Money Market rate T (RIT)	0.0673	(3.2114)**	0.0629	3.0698	0.0585	(2.9862)**	0.05831	(2.9848)**
R-squared								
Durbin-Watson	0.5777		0.5428		0.5068		0.5055	

Money Market—Malaysia

Money Supply M (log)(RMSM)	M-peg, T-peg		M-peg, T-float		M-float, T-peg		M-float, T-float	
variable	Est. Value	t-value	Est. Value	t-value	Est. Value	t-value	Est. Value	t-value
constant ©	23.7945	1.5924	24.8511	1.6503	20.5684	1.3976	20.5728	1.3993
Lending rate M (RIM)	0.0002	0.0006	−4.50E−03	−1.99E−01	−1.12E−02	−5.19E−01	−0.0111	−0.5246
U.S. Lending rate (RUSI)	−0.0004	−0.4046	−5.20E−03	−4.83E−01	−6.60E−03	−6.24E−01	−0.0066	−0.6258
Real GDP M (log)(RGDPM)	0.5715	−0.5684	−0.6465	−0.6379	−0.3614	−0.3648	−0.3617	−0.3654
Real Wealth M (log)(INVRWM)	−99.6031	−1.7913	−102.947	−1.8389	−86.5603	−1.5824	−86.5791	−1.5848
Dollar Exchange Risk M (ERDVM)	0.0498	0.1781	0.082	0.3008	0.1355	0.5065	0.1353	0.5084
R-squared								
Durbin-Watson	1.4753		1.4402		1.3488		1.3479	

Money Market—Thailand

Money Supply T (log)(RMST)	M-peg, T-peg		M-peg, T-float		M-float, T-peg		M-float, T-float	
variable	Est. Value	t-value	Est. Value	t-value	Est. Value	t-value	Est. Value	t-value
constant ©	7.2559	(2.1283)*	6.894	1.9433	7.8349	(2.3804)*	8.2573	(2.5086)*
Lending rate T (RIT)	−0.0577	(−6.0955)**	−6.20E−01	(−6.414)**	−0.053	(−6.2987)**	−0.0537	(−6.3751)**
U.S. Lending rate (RUSI)	0.0273	(2.7745)**	0.0294	(2.8837)**	0.0246	(2.6396)**	0.0241	(2.5808)**
Real GDP T (log)(RGDPT)	0.5047	(2.4983)*	0.5233	(2.4886)*	0.4728	(2.4197)*	0.4461	(2.2833)*
Real Wealth T (log)(INVRWT)	−29.6285	(−2.9451)**	−28.1197	(−2.6879)**	−31.7204	(−3.2863)**	−32.7023	(−3.3858)**
Dollar Exchange Risk T (ERDVT)	0.0033	0.6914	3.50E−03	6.92E−01	3.00E−03	6.56E−01	0.0029	0.6156
R-squared								
Durbin-Watson	1.818		1.71444		1.8946		1.8769	

Domestic Bond Market—Malaysia

Domestic Bonds M (log)(RBM)	M-peg, T-peg		M-peg, T-float		M-float, T-peg		M-float, T-float	
variable	Est. Value	t-value	Est. Value	t-value	Est. Value	t-value	Est. Value	t-value
constant ©	87.4282	(2.9980)**	87.4282	(2.998)**	87.4282	(2.998)**	87.4282	(2.998)**
Lending rate M (RIM)	−0.174	−1.0476	−0.174	−1.0476	−0.174	−1.0476	−0.174	−1.0476
U.S. Lending rate (RUSI)	−0.0868	−0.8095	−0.0868	−0.8095	−0.0868	−0.8095	−0.0868	−0.8095
Real GDP M (log)(RGDPM)	57.7718	(3.4836)**	57.7718	(3.4836)**	57.7718	(3.4836) *	57.7718	(3.4836)**
Real Wealth M (log)(INVRWM)	−68.9038	(−3.5955)**	−68.9038	(−3.5955)**	−68.9038	(−3.5955)**	−68.9038	(−3.5955)**
Dollar Exchange Risk M (ERDVM)	3.5788	(3.875)**	3.5788	(3.8750)**	3.5789	(3.875)**	3.5788	(3.875)**
R-squared								
Durbin-Watson	2.262		2.2621		2.26214		2.2621	

Domestic Bond Market—Thailand

Domestic Bonds T (log)(RBM)	M-peg, T-peg		M-peg, T-float		M-float, T-peg		M-float, T-float	
variable	Est. Value	t-value	Est. Value	t-value	Est. Value	t-value	Est. Value	t-value
constant ©	−30.3306	(−11.2289)**	−30.5147	(−11.3444)**	−30.7486	(−11.4140)**	−30.6996	(−11.4242)**
Lending rate T (RIT)	0.0456	1.5935	0.0412	1.4801	0.0363	1.4042	0.036	1.3543
U.S. Lending rate (RUSI)	0.0258	0.8758	0.0295	1.01	0.0338	1.1892	0.0336	1.1849
Real GDP T (log)(RGDPT)	1.7217	(3.1636)**	1.7862	(3.3017)**	1.8607	(3.4707)**	1.8535	(3.4624)**
Real Wealth T (log)(INVRWT)	2.3982	(4.7937)**	2.3361	(4.7100)**	2.2667	(4.6447)**	2.2708	(4.6564)**
Dollar Exchange Risk T (ERDVT)	−0.0059	−0.4164	−5.41E−03	−0.3782	−4.70E−03	−0.3272	−0.0047	−0.3324
R-squared								
Durbin-Watson	1.192		1.174		1.1527		1.1516	

Foreign Bond Market—Malaysia

Foreign Bonds M (log)(RFM)	M-peg, T-peg		M-peg, T-float		M-float, T-peg		M-float, T-float	
variable	Est. Value	t-value	Est. Value	t-value	Est. Value	t-value	Est. Value	t-value
constant ©	−4.3206	(−2.6018)**	−3.7397	(−2.3384)*	−3.9563	(−2.515)*	−3.8123	(1.5611)*
Lending rate M (RIM)	−0.0112	−0.2582	−0.0324	−0.7979	−0.0251	−0.6346	−0.0299	−0.768
U.S. Lending rate (RUSI)	−0.0429	(−2.194)*	−0.0449	(−2.3090)*	−0.0441	(−2.2770)*	−0.0446	(−2.3044)*
Real GDP M (log)(RGDPM)	−4.9723	−1.2729	−4.0502	−1.0481	−4.397	−1.1267	−4.1376	−1.0639
Real Wealth M (log)(INVRWM)	6.4925	1.643	5.5095	1.4111	5.8795	1.4907	5.6044	1.4265
Dollar Exchange Risk M (ERDVM)	−0.7089	−1.3381	−0.5328	−1.0347	−0.596	−1.1663	−0.5534	−1.0895
R-squared								
Durbin-Watson	1.1073		1.1891		1.1605		1.1793	

Foreign Bond Market—Thailand

Foreign Bonds T (log)(RFT)	M-peg, T-peg		M-peg, T-float		M-float, T-peg		M-float, T-float	
variable	Est. Value	t-value	Est. Value	t-value	Est. Value	t-value	Est. Value	t-value
constant ©	−4.2298	−1.7172	−4.2845	−1.7403	−4.2518	−1.7183	−4.3026	−1.7436
Lending rate T (RIT)	−0.0704	(−2.6980)**	−0.0666	(−2.6156)*	−0.0671	(−2.8296)**	−0.0668	(−2.8205)**
U.S. Lending rate (RUSI)	0.004	0.1502	2.20E−03	0.0832	2.30E−03	0.0877	0.0024	0.0931
Real GDP T (log)(RGDPT)	−0.9144	−1.8423	−0.9279	−1.8738	−0.9316	−1.8918	−0.9241	−1.8799
Real Wealth T (log)(INVRWT)	2.9113	(6.3808)**	2.93719	(6.4617)**	2.9348	(6.5472)**	2.9305	(6.54441)**
Dollar Exchange Risk T (ERDVT)	0.0291	(2.2207)**	0.02898	(2.2139)*	0.029	(2.2142)*	0.029	(2.2215)*
R-squared								
Durbin-Watson	2.2568		2.262		2.2626		2.2609	

Export to Thailand—Malaysia

Exports to Thailand (log)(REXM)	M-peg, T-peg		M-peg, T-float		M-float, T-peg		M-float, T-float	
variable	Est. Value	t-value	Est. Value	t-value	Est. Value	t-value	Est. Value	t-value
constant ©	−20.564	(−6.3926)**	−21.1027	(−6.5097)**	−20.6483	(−6.4101)**	−20.6317	(−6.4071)**
Real Ringgit–Bahts exchange rate (log)(REXR)	−1.7778	(−2.2224)*	−1.9107	(−2.3704)*	−1.7892	(−2.236)*	−1.7863	(−2.2328)*
Real GDP T (log)(RGDPT)	2.2957	(13.7608)**	2.3182	(13.8219)**	2.3015	(13.77)**	2.3005	(13.7701)**
Ringgit–Baht Exchange Risk (log)(ERDV2)	−6.7228	−0.2143	−7.9925	−0.2543	−6.8714	−0.219	−6.8399	−0.218
R-squared								
Durbin-Watson	1.1774		1.2111		1.18		1.1794	

Import from Thailand—Malaysia

Imports from Thailand (log)(RIMM)	M-peg, T-peg		M-peg, T-float		M-float, T-peg		M-float, T-float	
variable	Est. Value	t-value	Est. Value	t-value	Est. Value	t-value	Est. Value	t-value
constant ©	−8.2332	(−7.9846)**	−8.2698	(−7.9875)**	−8.1615	(−7.9162)**	−8.1615	(−7.9166)**
Real Ringgit–Bahts exchange rate (log)(REXR)	−0.5387	−1.805	−0.5494	−1.833	−0.5145	−1.7248	−0.5145	−1.7249
Real GDP M (log)(RGDPM)	1.877	(29.1981)**	1.8787	(24.1683)**	1.875	(29.1545)**	1.875	(29.1570)**
Ringgit–Baht Exchange Risk (log)(ERDV2)	13.0782	1.0006	12.9333	0.989	13.3561	1.0219	13.3561	1.0219
R-squared								
Durbin-Watson	1.3799		1.3803		1.3788		1.3788	

Export to Malaysia—Thailand

Exports to Malaysia (log)(REXT)	M-peg, T-peg		M-peg, T-float		M-float, T-peg		M-float, T-float	
variable	Est. Value	t-value	Est. Value	t-value	Est. Value	t-value	Est. Value	t-value
constant ©	−8.3527	(−7.142)**	−8.4375	(−7.1875)**	−8.4613	(−7.2371)**	−8.4564	(−7.2333)**
Real Ringgit–Bahts exchange rate (log)(REXR)	−0.4043	−1.194	−0.4324	−1.2722	−0.4367	−1.2912	−0.4358	−1.2885
Real GDP M (log)(RGDPM)	1.9154	(26.2684)**	1.918	(26.2638)*	1.9199	(26.3237)**	1.9195	(26.3207)**
Ringgit–Baht Exchange Risk (log)(ERDV2)	7.2032	0.4859	6.8705	0.4634	6.7676	0.4566	6.7882	0.458
R-squared								
Durbin-Watson	1.6788		1.6762		1.6765		1.6764	

Import from Malaysia—Thailand

Imports from Malaysia (log)(RIMT)	M-peg, T-peg		M-peg, T-float		M-float, T-peg		M-float, T-float	
variable	Est. Value	t-value	Est. Value	t-value	Est. Value	t-value	Est. Value	t-value
constant ©	−20.331	(−6.8926)**	−20.9264	(−7.0391)**	−20.4261	(−6.9157)**	−20.4285	(−6.9187)**
Real Ringgit–Bahts exchange rate (log)(REXR)	−1.8107	(−2.4686)**	−1.9575	(−2.6481)**	−1.824	(−2.4861)*	−1.8244	(−2.4871)*
Real GDP T (log)(RGDPT)	2.2675	(14.8222)**	2.2922	(14.9032)**	2.2738	(14.8371)**	2.2739	(14.8441)**
Ringgit–Baht Exchange Risk (log)(ERDV2)	−2.617	−0.091	−4.0162	−0.1393	−2.7836	−0.0967	−2.7882	−0.0969
R-squared								
Durbin-Watson	1.1166		1.151		1.1196		1.1197	

Export to U.S.—Malaysia

Exports to U.S. (log)(REXUSM)	M-peg, T-peg		M-peg, T-float		M-float, T-peg		M-float, T-float	
variable	Est. Value	t-value	Est. Value	t-value	Est. Value	t-value	Est. Value	t-value
constant ©	−80.7232	(−8.4240)**	−78.179	(−8.3497)**	−79.9693	(−8.4121)**	−78.0647	(−8.3216)**
Real Ringgit–Dollar exchange rate (log)(REXRUSM)	−2.6133	(−3.3535)**	−2.4953	(−3.2364)**	−2.5434	(−3.2926)**	−2.4037	(−3.1494)**
Real GDP U.S. (log)(RUSGDPT)	8.2629	(8.9277)**	8.1137	(8.8591)**	8.189	(8.9196)**	8.0056	(8.8361)**
Ringgit–Dollar Exchange Risk (log)(ERDVM)	1.2228	(2.2189)*	1.1853	(2.1666)*	1.1967	(2.1816)*	1.1541	(2.120)**
R-squared								
Durbin-Watson	0.705		0.6804		0.6909		0.6616	

Import from U.S.—Malaysia

Imports from U.S. (log)(RIMUSM)	M-peg, T-peg		M-peg, T-float		M-float, T-peg		M-float, T-float	
variable	Est. Value	t-value	Est. Value	t-value	Est. Value	t-value	Est. Value	t-value
constant ©	−5.9711	(−8.4798)**	−5.9711	(−8.4853)**	−5.9622	(−8.4733)**	−5.9612	(−8.4719)**
Real Ringgit–Dollar exchange rate (log)(REXRUSM)	−0.7273	(−2.6625)**	−0.7273	(−2.6658)**	−0.722	(−2.6448)**	−0.7228	(−2.6476)**
Real GDP M (log)(RGDPM)	2.0661	(16.4342)**	2.0661	(16.4487)**	2.0642	(16.4324)**	2.06423	(16.4321)**
Ringgit–Baht Exchange Risk (log)(ERDVM)	0.3313	1.2478	0.3313	1.2479	0.3296	1.2415	0.3301	1.2434
R-squared								
Durbin-Watson	1.0194		1.0194		1.0166		1.0169	

Export to U.S.—Thailand

Exports to U.S. (log)(REXUST)	M-peg, T-peg		M-peg, T-float		M-float, T-peg		M-float, T-float	
variable	Est. Value	t-value	Est. Value	t-value	Est. Value	t-value	Est. Value	t-value
constant ©	−63.2337	(−11.4698)**	−62.7546	(−11.4368)**	−62.7586	(−11.4356)**	−62.2805	(−11.4014)**
Real Bahts–Dollar exchange rate (log)(REXRUST)	−1.4551	(−3.4723)**	−1.418	(−3.3957)**	−1.4094	(−3.3883)**	−1.3879	(−3.3444)**
Real U.S. GDP (log)(RUSGDP)	6.8869	(11.9907)**	6.8331	(11.9575)**	6.8308	(11.9639)**	6.7818	(11.9322)**
Baht–Dollar Exchange Risk (log)(ERDVT)	−0.0185	−1.2793	−0.0191	−1.3267	−0.019	−1.318	−0.0198	−1.3779
R-squared								
Durbin-Watson	1.3832		1.3503		1.3379			

Import from U.S.—Thailand

Imports from U.S. (log)(RIMUST)	M-peg, T-peg		M-peg, T-float		M-float, T-peg		M-float, T-float	
variable	Est. Value	t-value	Est. Value	t-value	Est. Value	t-value	Est. Value	t-value
constant ©	−7.97.1	(−7.8023)**	−7.9221	(−7.7531)**	−7.9704	(−7.7931)**	−7.9563	(−7.7839)**
Real Bahts–Dollar exchange rate (log)(REXRUST)	−0.2986	−1.5404	−0.3031	−1.5627	−0.2936	−1.5162	−0.2936	−1.5162
Real GDP T (log)(RGDPT)	1.6889	(15.8916)	1.6859	(15.8712)**	1.6873	(15.8813)*	1.686	(15.8767)**
Baht–Dollar Exchange Risk (log)(ERDVT)	−0.0115	−1.2657	−0.0118	−1.2979	−0.0115	−1.2675	−0.0116	−1.2781
R-squared								
Durbin-Watson	1.0615		1.0644		1.0566		1.0562	

Aggregate Supply equation—Malaysia

Real GDP M (log)(RGDPM)	M-peg, T-peg		M-peg, T-float		M-float, T-peg		M-float, T-float	
variable	Est. Value	t-value	Est. Value	t-value	Est. Value	t-value	Est. Value	t-value
constant ©	7.5435	(4.813)**	7.5567	(4.8028)**	7.5568	(4.8161)**	7.5559	(4.8168)**
Real Ringgit–Bahts exchange rate (log)(REXR)	0.7717	1.2081	0.7852	1.2329	0.7838	1.251	0.7843	1.2525
Real Ringgit–Dollar exchange rate (log)(REXRUSM)	1.6977	(5.0035)**	1.7012	(5.0823)**	1.7009	(5.0954)**	1.7017	(5.1178)**
Lending rate M (RIM)	−0.0058	−0.1148	−0.004	−0.08256	−0.0044	−0.0948	−0.0042	−0.0922
Ringgit–Baht Exchange Risk (log)(ERDV2)	2.5402	0.0754	2.5667	0.07615	2.5687	0.0762	2.5569	0.0759
Ringgit–Dollar Exchange Risk (log)(ERDVM)	−0.1481	−0.2226	−0.1595	−0.0243	−0.1573	−0.2419	−0.1585	−0.2443
R-squared								
Durbin-Watson	0.6134		0.6142		0.6143		0.6144	

Aggregate Supply equation—Thailand

Real GDP T (log)(RGDPT)	M-peg, T-peg		M-peg, T-float		M-float, T-peg		M-float, T-float	
variable	Est. Value	t-value	Est. Value	t-value	Est. Value	t-value	Est. Value	t-value
constant ©	12.2745	(7.0992)**	12.3393	(7.0605)**	12.3438	(7.1973)**	12.3292	(7.1974)**
Real Ringgit–Bahts exchange rate (log)(REXR)	2.3372	(3.8872)**	2.3547	(3.9423)**	2.3433	(3.9761)**	2.3464	(3.9836)**
Real Baht–Dollar exchange rate (log)(REXRUST)	1.1346	(2.5155)*	1.1275	(2.5026)*	1.12E+00	(2.5792)**	1.1257	(2.5975)**
Lending rate T (RIT)	−0.0116	−0.3945	−0.0117	−0.4015	−0.0124	(−0.4562)	−0.012	−0.4436
Ringgit–Baht Exchange Risk (log)(ERDV2)	−18.1158	−0.5682	−1.77E+01	−0.5543	−17.3796	−0.5549	−17.6287	−0.5634
Baht–Dollar Exchange Risk (log)(ERDVT)	−0.0253	(−1.9677)*	−0.0253	−1.9645	−0.0252	(−1.9702)*	−0.0252	(1.9722)*
R-squared								
Durbin-Watson	0.7379		0.7426		0.741		0.741	