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## Dynamic analysis of exchange rate regimes: Policy implications for emerging countries in Asia

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**ADB Working Paper Series**

**Dynamic Analysis of Exchange  
Rate Regimes:  
Policy Implications for Emerging  
Countries in Asia**

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Naoyuki Yoshino, Sahoko Kaji,  
and Tamon Asonuma

No. 502  
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**Asian Development Bank Institute**

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**Abstract**

This paper discusses desirable exchange rate regimes and how countries can shift from their current regimes to these regimes over the medium term. We demonstrate the superiority of a basket-peg regime with the basket weight rule over a floating regime with the interest rate rule or the money supply rule in small open economies, during periods when volatility of exchange rates is moderate. Countries which currently have fixed exchange rates would be better moving toward either a basket-peg or a floating regime over the medium term. A shift to a basket-peg regime is preferred when exchange rate fluctuations are large.

**JEL Classification:** E42, F33, F41, F42

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## 1. INTRODUCTION

During the last 2 decades, East Asian countries have engaged in an intensive debate on the most desirable exchange rate regimes for the region. Before the Asian financial crisis, the dollar-peg was regarded as the most appropriate regime and most countries that kept their currencies at a constant rate against the US dollar benefited in terms of increases in trade and capital flows, despite the potential losses associated with giving up some of their monetary autonomy.

However, *de facto* dollar-peg regimes were blamed as one of the two major culprits in the Asian financial crisis. Large fluctuations of the exogenous exchange rate, such as the dollar–yen rate, negatively affected economies through the yen rate, although the dollar rate remained fixed.<sup>1</sup> The other culprit was a discrepancy in maturity between lending and borrowing by financial institutions in East Asian economies. Financial institutions in Indonesia, Republic of Korea, and Thailand borrowed on a short-term basis from abroad and lent to domestic firms on a long-term basis. Sudden withdrawals of funds during the crisis made these East Asian banks vulnerable.

Reflecting this criticism, several economists have supported a move to a basket-peg regime in East Asia, including Kawai (2004, 2007), Ito, Ogawa and Sasaki (1998), Ito and Park (2003), Ogawa and Ito (2002), and Yoshino, Kaji, and Suzuki (2004). These authors have argued that for countries with close economic relationships with multiple partners including members of the eurozone, Japan, and the United States, exchange rate stabilization using a basket of these currencies is beneficial, because countries are less affected by large fluctuations in a particular exchange rate.

Another reasonable alternative is a floating regime, as discussed by Yoshino, Kaji, and Suzuki (2004) and Yoshino, Kaji, and Asonuma (2004).<sup>2</sup> Adams and Semblat (2004) emphasize that one currency regime option is a floating regime with inflation targeting. Sussangkarn and Vichyanond (2007) also stress that managed floating plus inflation targeting suits an emerging market environment such as in Thailand where both the exchange rate and price stabilization are major concerns.

The desirability of a basket-peg or floating regime over a dollar-peg regime has been analyzed intensively but mainly been in a static rather than a dynamic context. Given the circumstances of East Asian countries, which are vulnerable to numerous shocks, it is essential to compare exchange rate regimes in a dynamic environment.

This paper looks at the policy implications of two interrelated dynamic situations. First, we discuss the superiority of the basket-peg and floating regimes over the dollar-peg regime for small open economies, focusing on specified instrument rules. Second, we examine whether a small, open economy, in terms of capital openness and financial liberalization, like the People's Republic of China (PRC), which currently has a fixed exchange rate regime with strict capital controls, would be better off maintaining the status quo or shifting to alternative regimes over the medium term.

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<sup>1</sup> Baig (2001) examines the behavior of the exchange rates of five ASEAN countries (Indonesia, the Republic of Korea, Malaysia, the Philippines, and Thailand) in the aftermath of the crisis and finds that results from the post-crisis data do not support the view that Asia-5 currencies have the same characteristics as they did before the crisis.

<sup>2</sup> However, there is a drawback in the floating regime: large exchange rate fluctuations negatively affect the economy, as shown in Yoshino, Kaji, and Ibuka (2003).

On the first question, by comparing the welfare losses for regimes with policy instruments, we find a basket-peg regime with the basket weight rule is superior to floating regimes using the interest rate rule or money supply rule in small open economies like Singapore and Thailand where the volatility of the exchange rates is moderate (about 5%). There are two reasons for this: (i) the monetary authority can focus only on effects of the yen exchange rate, because the dollar rate is endogenous but determined solely by the yen rate as long as the monetary authority maintains a weighted average of the exchange rates constant by foreign exchange market interventions; and (ii) commitment to the basket weight rule enables the monetary authority to stabilize the impacts on the output gap and the inflation rate through exchange rate channels. In addition, over a longer time span when the exchange rate fluctuations are small, the interest rate rule can also be an option, as shown in Singapore.

The second part of our analysis clearly indicates that countries would be better off shifting toward either a basket-peg or a floating regime over the medium term since the dollar-peg regime is desirable only in the short term. The basket-peg regime is superior to the floating regime if exchange rate fluctuations are large. Shifting toward a managed floating regime is less attractive than moving to a basket-peg regime, given the costs of intervening in the foreign exchange market. Our analysis can be applied to any small open countries in which exchange rate fluctuations are major concerns because they are linked to numerous partners through trade and capital movements.

The rest of the paper is organized as follows. Section 2 summarizes some streams in the literature. Section 3 provides an overview of recent developments in exchange rate regimes in the Association of Southeast Asian Nations, the PRC, Japan, and the Republic of Korea (ASEAN+3) in the post-Asian financial crisis period. A dynamic analysis of exchange rate regimes with rules of monetary and exchange rate policy instruments is presented in Section 4. Section 5 compares shifts toward regimes other than the dollar-peg. A short conclusion summarizes the paper.

## 2. LITERATURE REVIEW

This paper is related to several studies analyzing the desirability of basket-peg regimes in East Asia in a static context. Ito, Ogawa and Sasaki (1998) and Ogawa and Ito (2002) consider an optimal basket-peg regime under a partial equilibrium model that does not involve capital movements. Yoshino, Kaji, and Suzuki (2004) and Yoshino, Kaji, and Asonuma (2004) study an optimal basket-peg regime under a general equilibrium model with capital movements across countries. Bird and Rajan (2002) argue that pegging a currency against a more diversified currency basket would have enabled Southeast Asian countries to have dealt better with the “third currency phenomenon” which contributed to the crisis.<sup>3</sup> In an empirical analysis, McKibbin and Lee (2004) investigate which exchange rates East Asian countries should peg to using several shocks, which involve country-specific (asymmetric) shocks, and regional (symmetric) shocks.<sup>45</sup>

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<sup>3</sup> Any problems for emerging market countries that arise from fluctuations in the values of the currencies of their major trading partners against each other are considered to be the “third currency phenomenon.”

<sup>4</sup> Devereux (2002) also explores the role of the exchange rate regime in small open economies focusing on Hong Kong, China and Singapore.

Another stream of literature provides a dynamic analysis of exchange rate regimes in East Asia. Yoshino, Kaji, and Suzuki (2002) compare three exchange rate regimes, the basket-peg, the dollar-peg, and the floating regime, in the dynamic context and find that the basket-peg leads to the lowest cumulative loss among three options. Shioji (2006a, 2006b) considers exchange rates in a dynamic stochastic environment and focuses on exchange rate pass-through under the basket-peg regime with two different invoicing schemes of firms: producer currency pricing and vehicle currency pricing.

### **3. RECENT DEVELOPMENTS IN EXCHANGE RATES AND REGIMES IN ASEAN+3**

This section provides an overview of the exchange rate movements of ASEAN+3 currencies and the exchange rate regimes adopted by the ASEAN+3 countries in the post-Asian financial crisis period. Figure 1 portrays exchange rate fluctuations of ASEAN+3 currencies against the US dollar, normalized with respect to pre-crisis levels (January 1997). It is obvious that most ASEAN+3 currencies depreciated sharply at the onset of crisis (the yen and renminbi are exceptions) and maintained their levels during the post-crisis period. However, the Japanese yen and Chinese renminbi have been on a depreciating trend since 2006.<sup>6</sup>

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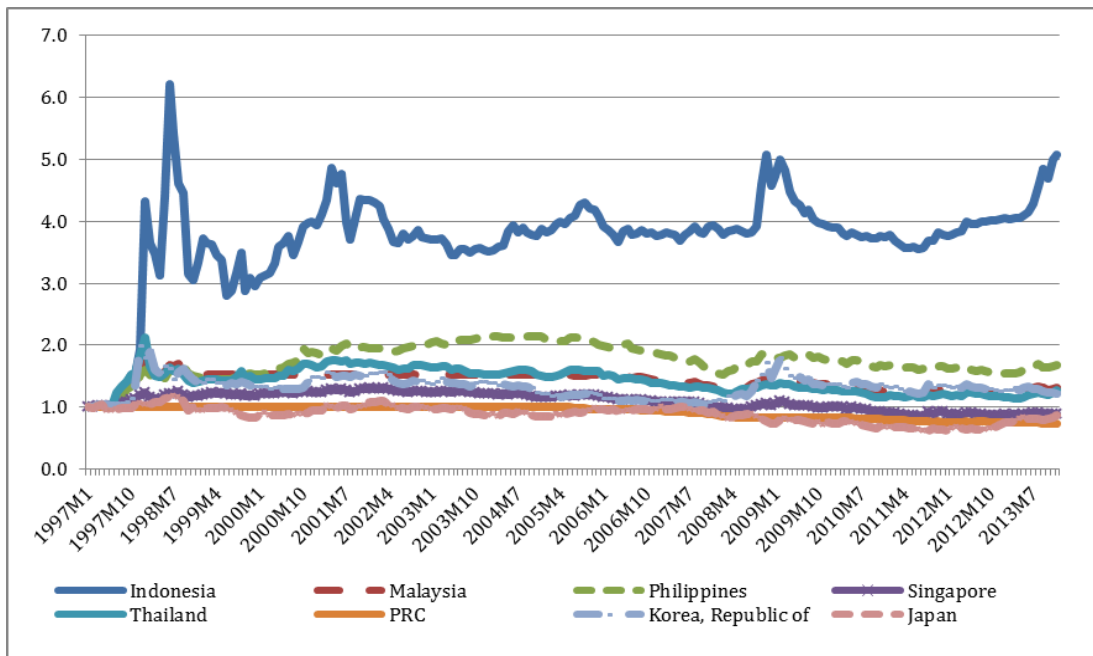
<sup>5</sup> Rajan and Siregar (2002) contrast the experiences of Hong Kong, China and Singapore where the former operates a US dollar-linked currency board arrangement and the latter maintains an adjustable peg in the form of a monitoring band arrangement with the central parity based on an undisclosed trade-weighted currency basket.

<sup>6</sup> Ma and McCauley (2011) find that in 2 years from mid-2006 to mid-2008, the Chinese renminbi strengthened gradually against trading partners' currencies within a narrow band.

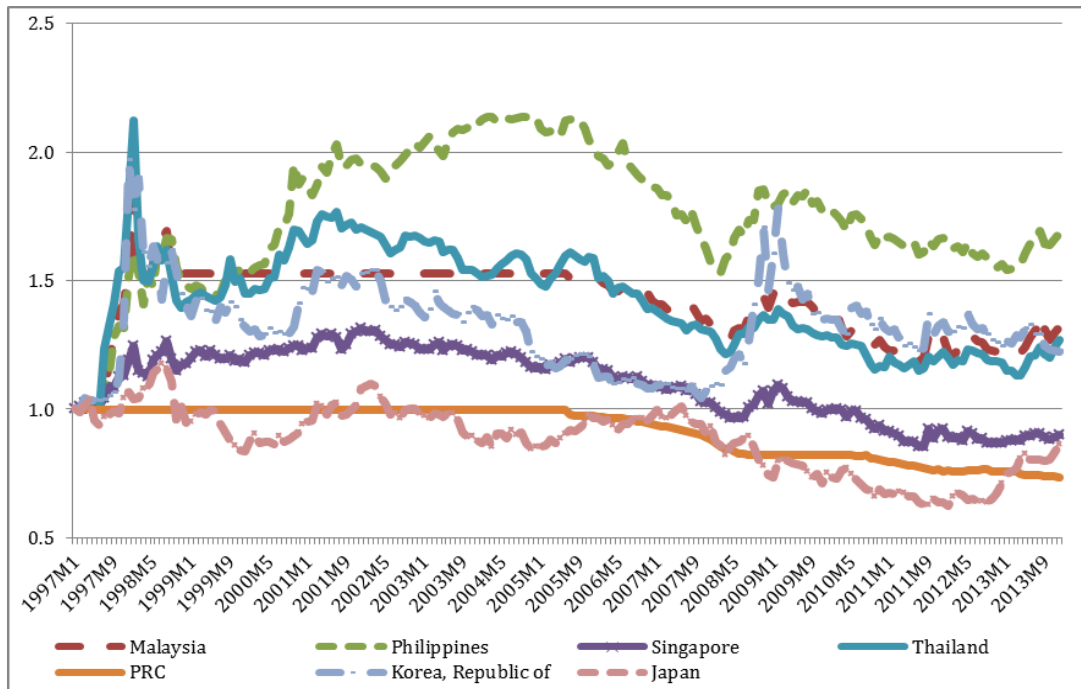


**Figure 1: Nominal Exchange Rates of ASEAN+3 Currencies against the US Dollar**

A. All countries (January 1997 = 1.0)



B. Excluding Indonesia (January 1997 = 1.0)



PRC = People's Republic of China.

Source: IMF International Financial Statistics.

Recent transitions of *de jure* exchange rate regimes in ASEAN+3 are summarized in Table 1.<sup>7</sup> It is noteworthy that most countries in ASEAN+3 except Japan have experienced shifts from one regime to another in the post-Asian financial crisis period and have experienced at least a small degree of change. Among them, we see two patterns of regime change: (i) a deviation from a conventional pegged arrangement associated with an increase in the flexibility of the exchange rate (as in the PRC and Malaysia) and (ii) a departure from a managed floating regime because of a reduction in foreign exchange market interventions (as in Indonesia and Thailand).

**Table 1: Transition of *De Jure* Exchange Rate Regimes in ASEAN+3**

Country	Arrangement in 2002 <sup>a</sup>	Arrangement in 2009 <sup>b</sup>	Arrangement in 2010 <sup>b</sup>
Indonesia	Managed float with no pre-announced path for the exchange rate	Floating	Floating
Malaysia	Conventional pegged arrangement	Floating	Other managed arrangement <sup>c</sup>
Philippines	Independent floating	Floating	Floating
Singapore	Managed float with no pre-announced path for the exchange rate	Floating	Other managed arrangement <sup>d</sup>
Thailand	Managed float with no pre-announced path for the exchange rate	Floating	Floating
People's Republic of China	Conventional pegged arrangement	Stabilized arrangement	Stabilized arrangement
Japan	Independent floating	Free floating	Free floating
Republic of Korea	Independent floating	Free floating	Floating

<sup>a</sup> The categories of exchange rate arrangements in 2002 are (1) hard pegs comprising (a) exchange arrangements with no separate legal tender and (b) currency board arrangement; and (2) soft pegs consisting of (a) conventional pegged arrangements, (b) pegged exchange rates within horizontal bands, (c) crawling pegs, (d) crawling band; (3) floating regimes, under which the exchange rate is market determined and characterized as (a) independent floating or (b) managed floating with no pre-announced path for the exchange rate.

<sup>b</sup> The categories of exchange rate arrangements in 2009 and 2010 are (1) hard pegs comprising (a) exchange arrangements with no separate legal tender and (b) currency board arrangement; and (2) soft pegs consisting of (a) conventional pegged arrangements, (b) pegged exchange rates within horizontal bands, (c) crawling pegs, (d) stabilized arrangements, and (e) crawl-like arrangements; (3) floating regimes, under which the exchange rate is market determined and characterized as (a) floating or (b) free floating; and a residual category, other managed arrangements.

<sup>c</sup> As a result of the ringgit tracking a composite, although not closely enough to be classified as a stabilized arrangement against a composite, effective 1 January 2009, the *de facto* exchange rate arrangement was reclassified retroactively to "other managed arrangement" from "floating."

<sup>d</sup> The Singapore dollar is allowed to fluctuate within a targeted policy band and is managed against a basket of currencies of the country's major trading partners and competitors. The various currencies are assigned weights in accordance with the importance of the country in Singapore's trade relations with the world. The exchange rate policy is announced every 6 months in the Monetary Policy Statement, typically in terms of changes to the slope of the policy band. The US dollar is the intervention currency. Accordingly, the *de facto* exchange rate arrangement was reclassified retroactively to "other managed arrangement" from "floating," effective 1 January 2006. However, the change is reflected as of 1 January 2009, corresponding to the first day of the coverage period in IMF Annual Report.

Source: IMF Annual Report on Exchange Rate Arrangements and Exchange Restrictions 2014.

<sup>7</sup> The classification of the *de facto* exchange rate arrangement, as reported in IMF (2000, 2009, 2010), may differ from countries' officially announced (*de jure*) arrangements.

In parallel with the *de jure* exchange rate regimes announced officially by the authorities, Iizetzki, Reinhart, and Rogoff (2011) provide more detailed classifications of exchange regimes considered as “*de facto*”. As was seen in the *de facto* case, we can see a deviation from a conventional pegged arrangement associated with greater exchange rate flexibility as in the PRC and Malaysia, i.e., a moving band that is narrower than or equal to  $\pm 2\%$  and a *de facto* crawling band that is narrower than or equal to  $\pm 5\%$ . Although the PRC seems to have returned to a *de facto* peg in October 2008 right after the global financial crisis, for the period from June 2010 to June 2012 it is assessed to have reverted to a moving band that is narrower than or equal to  $\pm 2\%$  as shown by the empirical analysis in Yoshino, Kaji, and Asonuma (2014). However, the Philippines and Singapore are assessed to be implementing *de facto* crawling bands that are narrower than or equal to  $\pm 2\%$  and moving band that is narrower than or equal to  $\pm 2\%$  respectively rather than floating or managed floating regimes.

**Table 2: Transition of *De Facto* Exchange Rate Regimes in ASEAN+3**

Country	Arrangement in end-2002 <sup>a</sup>	Arrangement in end-2005 <sup>a</sup>	Arrangement in end-2008 <sup>a</sup>	Arrangement in end-2010 <sup>a</sup>
Indonesia	Managed floating	De facto crawling band that is narrower than or equal to $\pm 5\%$	De facto crawling band that is narrower than or equal to $\pm 5\%$	De facto crawling band that is narrower than or equal to $\pm 5\%$
Malaysia	Pre-announced peg or currency board arrangement	De facto peg	De facto crawling band that is narrower than or equal to $\pm 5\%$	De facto crawling band that is narrower than or equal to $\pm 5\%$
Philippines	De facto crawling band that is narrower than or equal to $\pm 2\%$	De facto crawling band that is narrower than or equal to $\pm 2\%$	De facto crawling band that is narrower than or equal to $\pm 5\%$	De facto crawling band that is narrower than or equal to $\pm 5\%$
Singapore	Moving band that is narrower than or equal to $\pm 2\%$	Moving band that is narrower than or equal to $\pm 2\%$	Moving band that is narrower than or equal to $\pm 2\%$	Moving band that is narrower than or equal to $\pm 2\%$
Thailand	Moving band that is narrower than or equal to $\pm 2\%$	Moving band that is narrower than or equal to $\pm 2\%$	Moving band that is narrower than or equal to $\pm 2\%$	Moving band that is narrower than or equal to $\pm 2\%$
People's Republic of China	De facto peg	Moving band that is narrower than or equal to $\pm 2\%$	De facto peg	De facto peg
Japan	Free floating	Free floating	Free floating	Free floating
Republic of Korea	Free floating	Free floating	Free floating	Free floating

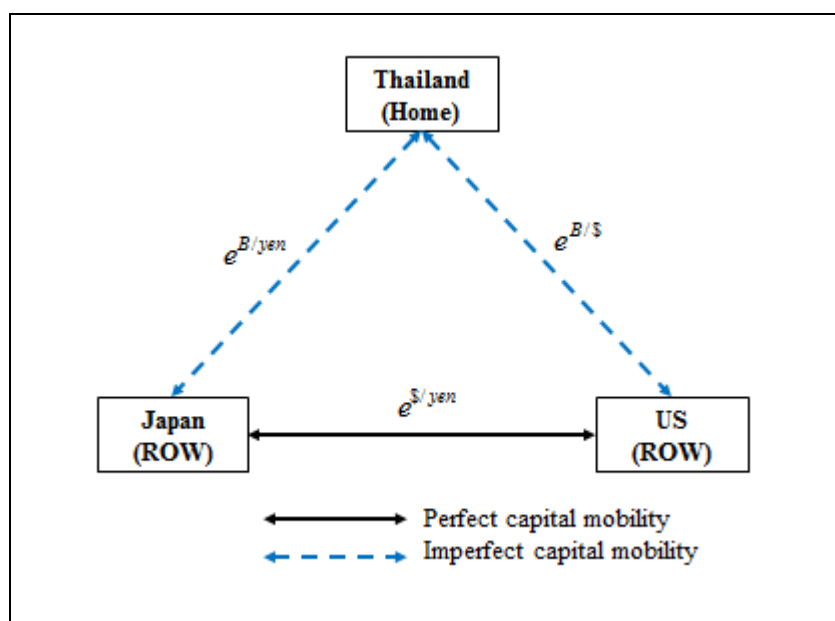
<sup>a</sup> The categories of *de jure* exchange rate arrangements are (1) no separate legal tender, (2) pre-announced peg or currency board arrangement, (3) pre-announced horizontal band that is narrower than or equal to  $\pm 2\%$ , (4) *de facto* peg, (5) pre-announced crawling peg, (6) pre-announced crawling band that is narrower than or equal to  $\pm 2\%$ , (7) *de facto* crawling peg, (8) *de facto* crawling band that is narrower than or equal to  $\pm 2\%$ , (9) pre-announced crawling band that is wider than or equal to  $\pm 2\%$ , (10) *de facto* crawling band that is narrower than or equal to  $\pm 5\%$ , (11) moving band that is narrower than or equal to  $\pm 2\%$ , (12) managed floating, (13) freely floating, (14) freely falling, and (15) dual market in which parallel market data is missing.

Source: Iizetzki, Reinhart, and Rogoff (2010).

## 4. DYNAMIC ANALYSIS BASED ON INSTRUMENT RULES OF MONETARY POLICY

The summary of the transitions of the exchange rates and regimes in the post-crisis period in the previous section supports the need for dynamic analysis. Although some studies attempt to consider the most desirable regime for the region in a dynamic context, the links between the exchange regimes and the instrument rules of monetary policy are not comprehensively discussed. In this regard, Yoshino, Kaji and Asonuma (2012a) analyze the superiority of a basket-peg regime over a floating regime, focusing particularly on possible instrument rules, which the countries implement under these regimes. Their model is a small open economy model where the rest of the world is divided into two countries shown in Figure 2. It assumes Thailand to be the home country and Japan and the US to be the rest of the world (ROW). The yen–dollar rate is exogenous to Thailand.<sup>8</sup>

Figure 2: Model of Small Open Economy and the Rest of the World



ROW = rest of world, US = United States.

Source: Yoshino, Kaji, and Asonuma (2012a).

Some interesting policy implications emerge from Table 3, which reports simulation results based on actual shocks in Singapore and Thailand for Q3 1997–Q2 2006. First, the cumulative loss under the basket weight rule is the smallest among the five policy instrument rules in both countries. It indicates that the central bank can effectively

<sup>8</sup> Yoshino, Kaji, and Asonuma (2012a) assume that domestic and foreign assets are imperfect substitutes whereas US assets and Japanese assets are perfect substitutes for domestic investors.

minimize the impacts on the output gap and inflation through exchange rate channels by committing to its basket weight to specific policy target variables.<sup>9</sup>

Second, the loss under the augmented interest rate rule is smaller than that under the interest rate rule. This shows clearly the advantage of committing to a rule that includes the dollar rate as an additional target because both output gap and inflation are largely affected by fluctuations in the dollar rate. Lastly, the higher values of cumulative losses under the trade weight rule and the fixed rate rule compared to those under the basket weight rule rely on the inefficiency of the rules, such that the central bank cannot adjust the basket weight smoothly to react against shocks.

**Table 3: Discounted Cumulative Loss Values**

Regime	Policy Rule	Loss for Singapore	Loss for Thailand
Floating	Interest rate	0.446	0.279
	Augmented interest rate <sup>a</sup>	0.385	0.277
	Money supply	0.400	0.234
Basket-peg	Basket weight	0.317	0.188
	Trade weight	0.636	0.296
Dollar-peg	Fixed rate	0.907	0.446

<sup>a</sup> The augmented interest rate rule includes the dollar-rate as a third target.

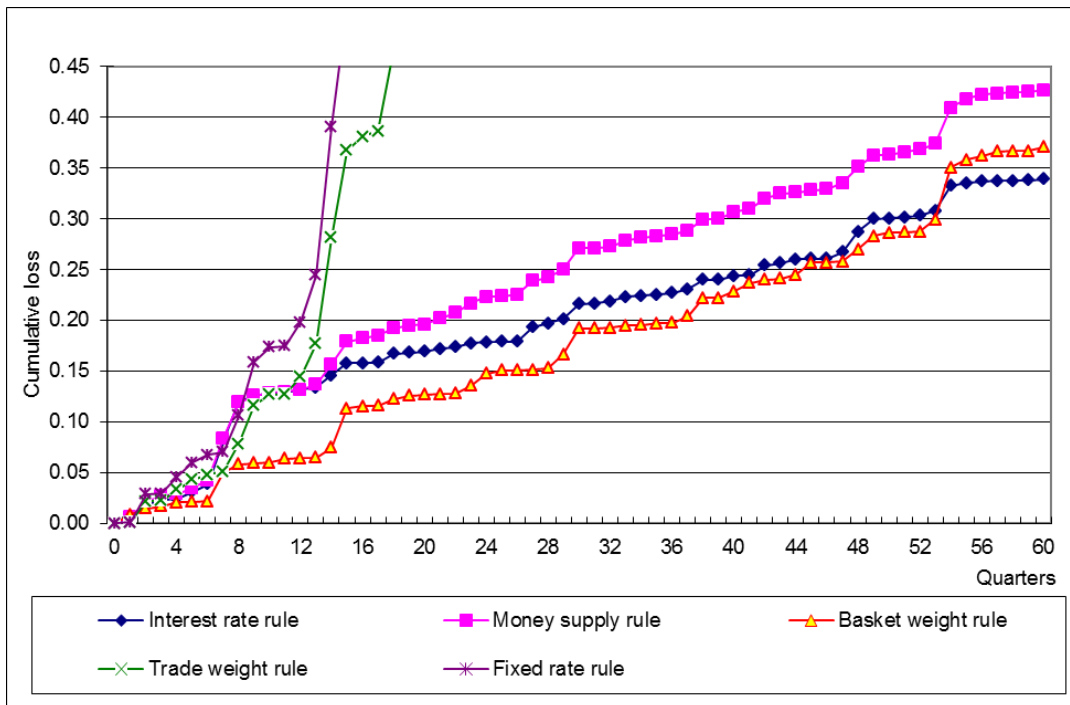
Source: Authors' calculations.

Figure 3 reports the cumulative long-term losses using random exogenous shocks in the post-Asian financial crisis era. Two features can be noted. One is that, in the case of Singapore, the cumulative loss under the interest rate rule is smaller than that under the basket weight rule as the time span is longer (over 53 quarters). The interest rate rule enjoys an advantage during a long and tranquil period during which the variance of the real dollar rate shock is small. The second feature is that the computed loss under the basket weight rule remains the smallest for Thailand even if the sample period is longer. As long as the variances in both the dollar and the yen exchange rates are moderate (around 0.05), the central bank is still able to benefit from a commitment to the rule through exchange rate channels.

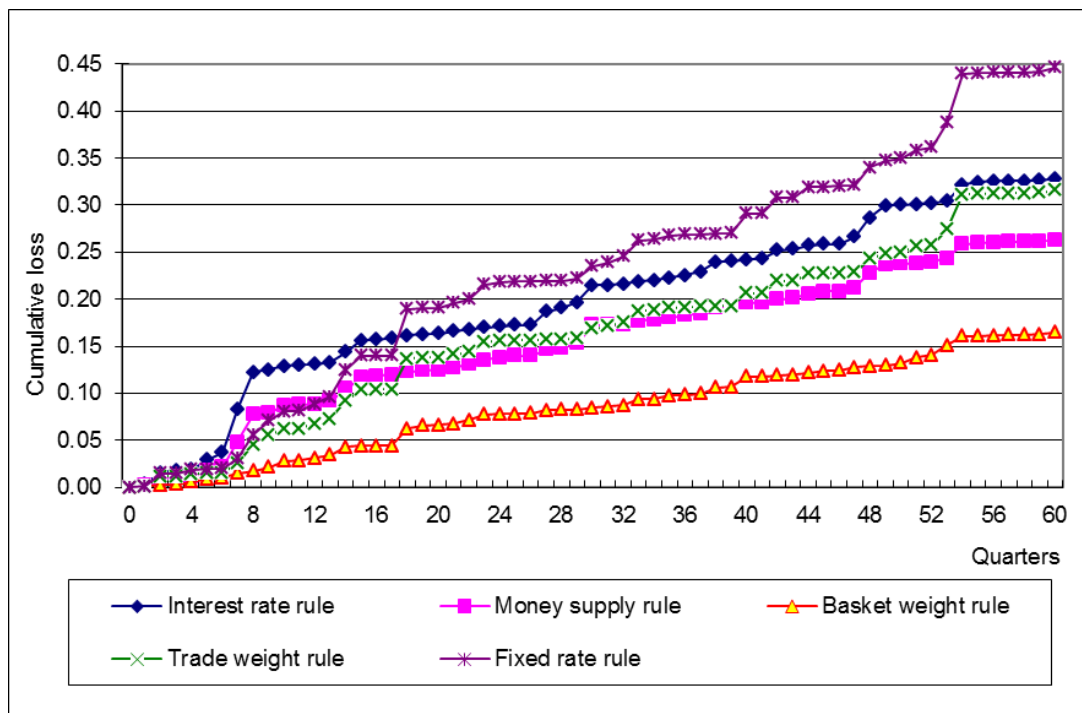
<sup>9</sup> Contrary to the Monetary Authority of Singapore (MAS) framework proposed by McCallum (2007), our basket weight rule is one in which the inflation and output gap are the main target variables with the basket weight being used primarily as an instrument.

**Figure 3: Cumulative Losses with Random Shocks for a Long Time Span**

(1) Singapore



(2) Thailand



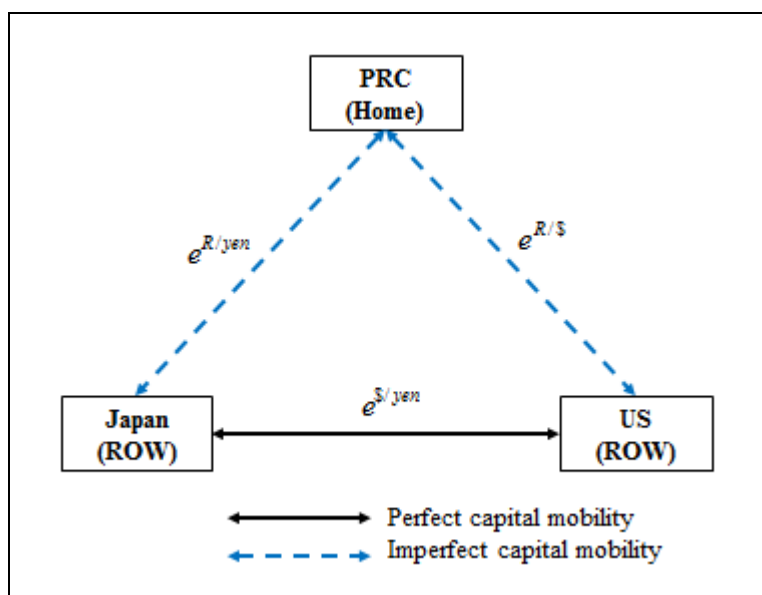
Source: Authors' calculations.

## 5. SHIFTS FROM A FIXED REGIME TO ALTERNATIVE REGIMES

We learned from the previous section that a basket-peg and a floating regime are both desirable for East Asian countries over the medium term. However, there remains a big question: how large are the costs associated with a transition from a fixed regime to alternative regimes for countries which currently have a fixed regime?<sup>10</sup>

Yoshino, Kaji, and Asonuma (2011) consider whether these countries would be better off maintaining the status quo (the fixed regime with strict capital controls) or shifting to an alternative regime, taking into account the costs and benefits that would be generated by moving to other regimes. As in Section 4, the model is a small open economy model where the rest of the world is divided into two countries shown in Figure 4. In this case, the PRC is treated as the home country, i.e., a small open economy given its capital openness and financial liberalization, and Japan and the US as the rest of the world (ROW). Once again the yen-dollar rate remains exogenous to the PRC.<sup>11</sup>

Figure 4: Model in Yoshino, Kaji, and Asonuma (2011)



PRC = People's Republic of China, ROW = rest of world, US = United States.

Source: Yoshino, Kaji, and Asonuma (2011).

Besides maintaining the current regime, shown as policy (1) in Figure 5, the options for the country are to shift to a basket-peg regime or to a floating regime.

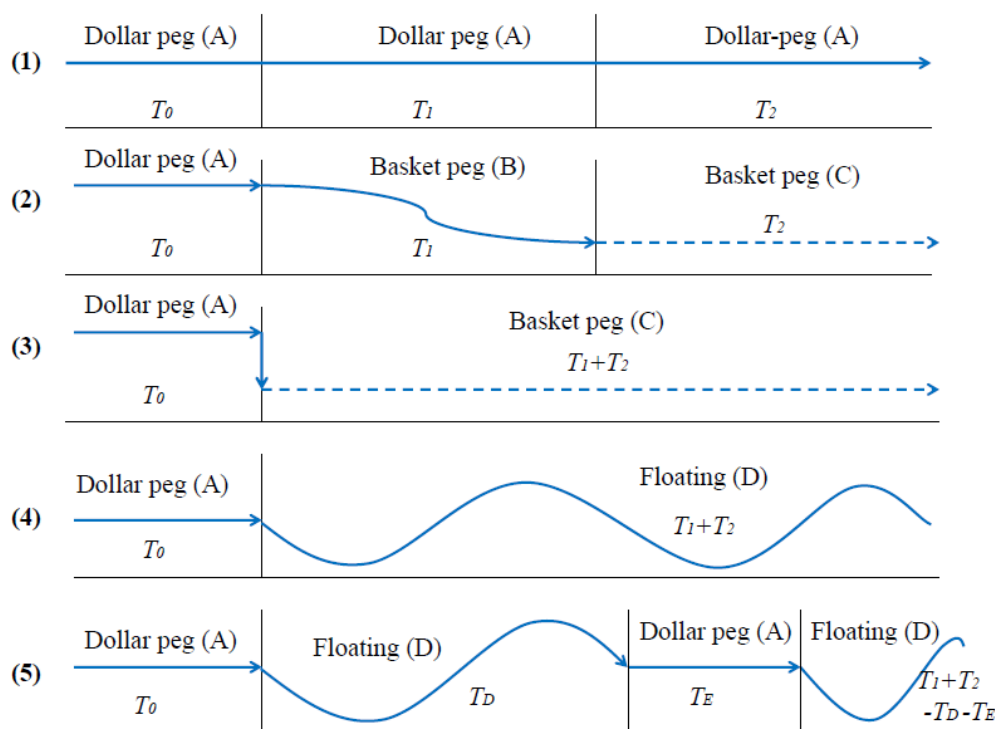
<sup>10</sup> Yoshino, Kaji, and Asonuma (2014) discuss the most desirable dynamic transition policy for the PRC, in line with recent development of exchange rate policy in the country.

<sup>11</sup> Yoshino, Kaji, and Asonuma (2011) assume that domestic and foreign assets are imperfect substitutes whereas US assets and Japanese assets are perfect substitutes for domestic investors.

For the move to a basket-peg regime, Figure 5 shows two possible routes the country can take. Starting with the dollar-peg regime with strict capital controls, under policy (2) the country can shift to a basket-peg regime with loose capital controls, and finally reach the basket-peg with no capital controls, i.e., it can gradually adjust both the degree of capital controls and basket weight. Policy (3) also starts with the dollar-peg regime with strict capital controls, with the country suddenly shifting to the basket-peg regime without capital controls by removing the capital controls, i.e., it can make a sudden shift of both capital controls and basket weight.

The move to a floating regime also involves two options: policy (4) starting with the dollar-peg regime with strict capital controls and suddenly shifting to the free floating regime by removing capital controls, or policy (5) starting with the dollar-peg regime with strict capital controls and suddenly shifting to the managed floating regime by removing capital controls. In this case the country intervenes in the foreign exchange market when a large exchange rate fluctuation adversely affects the economy.

**Figure 5: Policies toward Stable Regimes**



Source: Yoshino, Kaji, and Asonuma (2011).

Tables 4 and 5 are based on simulation results using Chinese and Thai data. The major policy implications of these tables can be summarized as follows.

First, maintaining a dollar-peg regime is desirable only in the short term for both the PRC and Thailand, indicating that they would be better shifting to either a basket-peg regime or a floating regime in the long term. This result does not depend on the policy targets the monetary authorities are aiming to achieve; with regard to both output stability and price level stability, it is desirable to move from a dollar-peg regime.

Second, concerning the choice between a gradual adjustment (policy 2) toward a desired basket-peg regime or a sudden shift to a desired basket-peg regime (policy 3),



the longer the transition period, the greater the benefits the countries receive from reaching the desired regime at once. However, the countries would suffer losses from the shifts and a gradual adjustment would enable them to smooth these out over a period of time. Therefore, countries usually prefer to have a transition period to minimize these losses. A transition period of an intermediate length (18 quarters), enables a gradual adjustment toward a desired basket-peg regime. For both output stability and price level stability, a gradual adjustment is found to be desirable.

Third, comparing the sudden shifts to a basket-peg regime (policy 3) and to a floating regime (policy 4), the welfare of the country would be higher under the shift to the basket-peg regime if exchange rate fluctuations are large.<sup>12</sup> In the case of Thailand, a shift to a basket-peg regime is preferred for both policy targets, while in the case of the PRC, an optimal solution varies depends on the policy targets.

Fourth, a shift to a managed float is less attractive than a move to a basket-peg. This is because intervening in foreign exchange rate markets for certain periods leads to higher losses, as the monetary authority lacks policy autonomy. This is true for both the PRC and Thailand, both of which are concerned with stabilizing output and price level fluctuations.

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<sup>12</sup> The country would be able not only to stabilize the negative impacts of exchange rate fluctuations on trade and capital inflows, but also to let the private sector formulate exchange rate expectation precisely by committing to the basket regime for certain periods.

**Table 4: Comparison of Five Transitional Policies for the PRC****A. Output Stability**

	Policy (1)	Policy (2)	Policy (3)	Policy (4)	Policy (5) <sup>b</sup> ( $T_E=5$ )
<b>Desirable regime</b>	Dollar-peg	Basket-peg	Basket-peg	Floating	Managed floating
<b>Adjustment</b>	n.a.	Gradual	Sudden	Sudden	Sudden
<b>Instrument value</b>	$i^* = 4.34$	$v^* = 0.56$	$v^{**} = 0.68$	$m^* = 0.016$	$m^{**} = 0.017$
<b>Cumulative loss (value)</b>	17.04	1.80	1.91	2.67	2.31
<b>Cumulative loss<sup>a</sup> (% of <math>\bar{y}^2</math>)</b>	23.4	2.4	2.6	3.7	3.2

**B. Price Stability**

	Policy (1)	Policy (2)	Policy (3)	Policy (4)	Policy (5) <sup>d</sup> ( $T_E=5$ )
<b>Desirable regime</b>	Dollar-peg	Basket-peg	Basket-peg	Floating	Managed floating
<b>Adjustment</b>	n.a.	Gradual	Sudden	Sudden	Sudden
<b>Instrument value</b>	$i^* = 4.34$	$v^* = 0.65$	$v^{**} = 0.78$	$m^* = 0.11$	$m^{**} = 0.01$
<b>Cumulative loss (value)</b>	0.30	0.020	0.021	0.013	0.033
<b>Cumulative loss<sup>c</sup> (% of <math>\bar{p}^2</math>)</b>	33.0	2.2	2.3	1.4	3.3

n.a. = not applicable

<sup>a</sup> We calculate the value of  $\bar{y}^2$  and obtain  $\bar{y}^2=72.8$ .<sup>b</sup> If  $T_E=7$ , cumulative loss is 3.54 ( $m^* = 0.017$ ).<sup>c</sup> We calculate the value of  $\bar{p}^2$  and obtain  $\bar{p}^2 = 0.91$ .<sup>d</sup> If  $T_E=7$ , the cumulative loss is 0.35 ( $m^* = 0.015$ ).

Source: Authors' calculations.

**Table 5: Comparison of Five Transitional Policies for Thailand****A. Output Stability**

	Policy (1)	Policy (2)	Policy (3)	Policy (4)	Policy (5) <sup>b</sup> (T <sub>E</sub> =3)
<b>Desirable regime</b>	Dollar-peg	Basket-peg	Basket-peg	Floating	Managed floating
<b>Adjustment</b>	n.a.	Gradual	Sudden	Sudden	Sudden
<b>Instrument value</b>	$i^* = 0.003$	$v^* = 0.68$	$v^{**} = 0.62$	$m^* = 0.082$	$m^{**} = 0.082$
<b>Cumulative loss (value)</b>	0.0069	0.0006	0.0026	0.0052	0.0053
<b>Cumulative loss<sup>a</sup> (% of <math>\bar{y}^2</math>)</b>	15.0	1.3	5.7	11.3	11.5

**B. Price Level Stability**

	Policy (1)	Policy (2)	Policy (3)	Policy (4)	Policy (5) <sup>d</sup> (T <sub>E</sub> =3)
<b>Desirable regime</b>	Dollar-peg	Basket-peg	Basket-peg	Floating	Managed floating
<b>Adjustment</b>	n.a.	Gradual	Sudden	Sudden	Sudden
<b>Instrument value</b>	$i^* = 0.00005$	$v^* = 0.14$	$v^{**} = 0.59$	$m^* = 0.0011$	$m^{**} = 0.0019$
<b>Cumulative loss (value)</b>	0.0044	0.0022	0.0028	0.0038	0.0033
<b>Cumulative loss<sup>c</sup> (% of <math>\bar{p}^2</math>)</b>	5.6	2.8	3.6	4.8	4.2

n.a. = not applicable

<sup>a</sup> We calculate the value of  $\bar{y}^2$  and obtain  $\bar{y}^2 = 0.046$ .

<sup>b</sup> If T<sub>E</sub>=5, cumulative loss is 3.54 ( $m^{**} = 0.082$ ).

<sup>c</sup> We calculate the value of  $\bar{p}^2$  and obtain  $\bar{p}^2 = 0.079$ .

<sup>d</sup> If T<sub>E</sub>=5, the cumulative loss is 0.0033 ( $m^{**} = 0.0024$ ).

Source: Authors' calculations.

## 6. CONCLUSION

This paper has attempted to consider two questions related to the discussion on desirable exchange rate regimes in East Asia, employing a dynamic environment. The first is: what is the most desirable exchange rate regime for countries over the medium term in relation to the functions of instrument rules in monetary policy? The second is: would a small open economy which currently has a fixed exchange rate regime be better staying with the current regime or shifting to an alternative regime over the medium term?

We find first that the basket-peg regime with a basket weight rule is superior to the floating regime with an interest rate rule or a money supply rule in small open economies, over periods when the volatility of the exchange rates is moderate. The latter half of the analysis suggests that the countries would be better off shifting toward either a basket-peg or a floating regime over the medium term. A shift to a basket-peg is preferable relative to a shift to a floating regime when the exchange rate fluctuations are large. Shifting toward a managed floating regime is less attractive than shifting to a basket-peg given the costs of intervening in the foreign exchange markets.

Although our analysis centers on the exchange rate regimes in East Asia, it has implications for any small open economies with similar features. For simplicity, our dynamic exercise was limited to small open economies. The dynamic analysis of two interdependent economies carried out in Yoshino, Kaji, and Asonuma (2012b) may provide additional insights.

## REFERENCES

- Adams, C., and R. Semblat. 2004. Options for Currency Arrangements and Their Policy Implications. In *Exchange Rate Regimes in East Asia*, edited by G. De Brouwer and M. Kawai. London: Routledge.
- Baig, T. 2001. Characterizing Exchange Rate Regimes in Post-Crisis East Asia. IMF Working Paper, WP/01/152. IMF.
- Bird G., and R. Rajan. 2002. Optimal Currency Baskets and the Third Currency Phenomenon: Exchange Rate Policy for Southeast Asia. *Journal of International Development*. 14: 1053–1073.
- Devereux, M. 2003. A Tale of Two Currencies: The Asian Crisis and the Exchange Rate Regimes of Hong Kong and Singapore. *Review of International Economics*. 11: 38–54.
- Kawai, M. 2007. Toward a Regional Exchange Rate Regime in East Asia. ADB Institute Discussion Paper, No. 68. Tokyo: ADBI.
- Kawai, M. 2004. The Case for a Tri-polar Currency Basket System for Emerging East Asia. In *Exchange Rate Regimes in East Asia*, edited by G. De Brouwer and M. Kawai. London: Routledge.
- Ilzetzi, E., C. Reinhart, and K. Rogoff. 2010. Exchange Rate Arrangements Entering the 21st Century: Which Anchor Will Hold?" manuscript, London School of Economics.
- International Monetary Fund. 2014. *Annual Report on Exchange Rate Arrangements and Exchange Restrictions*. Washington, DC.
- Ito, T., E. Ogawa, and Y. N. Sasaki. 1998. How Did the Dollar Peg Fail in Asia? *Journal of the Japanese and International Economies*. 12: 256–304.
- Ito, T., and Y. C. Park. 2003. Exchange Rate Regimes in East Asia. In *Monetary and Financial Integration in East Asia: The Way Ahead, Vol.1*. Basingstoke, UK: Asian Development Bank and Palgrave Macmillan.
- Ma, G., and R. McCauley. 2011. The Evolving Renminbi Regime and Implications for Asian Currency Stability. *Journal of the Japanese and International Economies*. 25: 23–38.
- McCallum, B. 2007. Monetary Policy in East Asia: The Case of Singapore. Institute of Monetary and Economic Studies Working Paper IMES Discussion Paper Series. 07-E-010. Tokyo: Bank of Japan.
- McKibbin, W., and Lee, H. G. 2004. Which Exchange Regime for East Asia? In *Exchange Rate Regimes in East Asia*, edited by G. De Brouwer and M. Kawai. London: Routledge.
- Ogawa, E., and T. Ito. 2002. On the Desirability of Regional Basket Currency Arrangement. *Journal of the Japanese and International Economies*. 16: 317–334.

- Rajan, R., and R. Siregar. 2002. Choice of Exchange Rate Regime: Currency Board (Hong Kong) or Monitoring Band (Singapore)? *Australian Economic Review*, 44: 538–556.
- Shioji, E. 2006a. Invoicing Currency and the Optimal Basket-peg for East Asia: Analyzing Using a New Open Macroeconomic Model. *Journal of the Japanese and International Economies*. 20: 569–589.
- Shioji, E. 2006b. Chinese Exchange Rate Regimes and the Optimal Basket Weights for the Rest of East Asia. RIETI Discussion Paper Series. 06-E-024. Tokyo: RIETI.
- Sussangkarn, C., and P. Vichyanond. 2007. Ten Years after the Financial Crisis in Thailand: What has been learned and not learned? *Asian Economic Policy Review*, 2: 100–118.
- Yoshino, N., S. Kaji, and T. Asonuma. 2014. Dynamic Transition of Exchange Rate Regime in China. *China & World Economy*. 22(3): 36–55.
- Yoshino, N., S. Kaji, and T. Asonuma. 2012a. Choices of Optimal Monetary Policy Instruments under the Floating and the Basket-peg Regimes. *Singapore Economic Review*. 57(4): 1250024.
- Yoshino, N., S. Kaji, and T. Asonuma. 2012b. Dynamic Adjustments toward the Stable Basket-peg or Floating Regime in a Two-Country General Equilibrium Model. Manuscript.
- Yoshino, N., S. Kaji, and T. Asonuma. 2011. Dynamic Effect of Change in Exchange Rate System - From the Fixed Exchange Rate Regime to the Basket-peg Regime or Floating Regime. Keio/Kyoto Global COE Discussion Paper Series. DP2011-026. <http://www.gcoe-econbus.keio.ac.jp/english/cat49/>.
- Yoshino, N., S. Kaji, and T. Asonuma. 2004. Optimal Exchange Rate System in Two Countries with the Rest of the World. *Keio Economic Studies*. 41: 25–75.
- Yoshino, N., S. Kaji, and Y. Ibuka. 2003. The Stabilization of an Open Economy with Capital Controls: An Analysis Using Malaysian Data. *Asian Economic Papers*. 2: 63–83.
- Yoshino, N., S. Kaji, and A. Suzuki. 2004. The Basket-peg, Dollar-peg and Floating: A Comparative Analysis. *Journal of the Japanese and International Economies*. 18: 183–217.
- Yoshino, N., S. Kaji, and A. Suzuki. 2002. A Comparative Analysis of Exchange Rate Regimes. In L. Ho and C.W. Yuen, eds. *Exchange Rate Regimes and Macroeconomic Stability*. New York: Kluwer Academic Publishers.