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Dynamic Effect of Change in Exchange Rate System -From the Fixed Exchange Rate Regime to the Basket-peg or Floating Regime

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We quantify dynamic effect of shifts of exchange rate system from the dollar-peg to the basket-peg or floating and obtain transition paths for the shifts, based on a dynamic small open-economy model. We find that a small open country will be better off shifting to the basket-peg or floating regime than maintaining the dollar-peg regime with capital control, in the long-run. Furthermore, because of welfare costs associated with volatility in nominal interest rates, the longer the transition period, the more benefits a country gains from shifting suddenly to the basket-peg from the dollar-peg regime rather than proceeding gradually. Thirdly, focusing on sudden shifts to desired regimes, welfare gain of the country is higher under a shift to the basket-peg if the exchange rate fluctuates remarkably. Lastly, concerning with shifting to the managed floating, it is less attractive to adopt compared with shifting to the basket-peg as intervening to maintain the exchange rate for certain periods leads to higher losses as the authority lacks monetary policy autonomy.

JEL Classification Codes: F33, F41
Key words: Exchange rate regime, basket-peg, floating regime, transition path

1 Introduction

One of the two major culprits of the 1997-98 Asian financial crisis was adoption of the actual dollar-peg by some countries in East Asia. The other culprit was the discrepancy in maturity between...
lending and borrowing by financial institutions in East Asian economies. Financial institutions in Thailand, Indonesia and Korea borrowed on the short-term from abroad and lent to domestic firms on long-term. Sudden withdrawal of funds made East Asian banks vulnerable to the crisis.\footnote{McKibbin and Martin (1999) also address that the primary cause of the East Asia Crisis was a fundamental reassessment of the profitability of investments in the region.}

Several economists support the desirability of the basket-peg regime in East Asia. For example, Kawai (2004), Ito and Park (2003), Yoshino, Kaji, and Suzuki (2004), and Ogawa and Ito (2002) recommend that East Asian countries embrace the basket-peg regime.\footnote{Concerning the composition of the basket, Ogawa and Ito (2002) and Kawai (2004) claim the G-3 (US dollar, Japanese yen, euro) basket, while Yoshino, Kaji and Asonuma (2005a) emphasize that East Asian countries adopt the basket of both G-3 currencies and also East Asian currencies. Moreover, Yoshino, Kaji, and Asonuma (2005b) discuss the optimal weights and composition of basket currency in East Asia.} The rationale for adopting the basket-peg regime is that for countries with close economic relationships with the European Union, Japan and the United States, exchange rate stabilization vis-a-vis a basket comprising these currencies was beneficial, because it removed the problem of large fluctuations in exchange rates.

Furthermore, Yoshino, Kaji, and Asonuma (2004) insist that together with the basket-peg regime, the floating regime is also an option for East Asian countries.\footnote{However, there is also a drawback in adopting the floating regime; too much fluctuations of the exchange rates affects the economy negatively as shown in Yoshino, Kaji, and Ibuka (2003).} Moreover, Adams and Semblat (2004) emphasize that one of the currency regime options is adopting the floating regime with inflation targeting.

The superiority of the basket-peg or the floating regime relative to the dollar-peg regime has been analyzed in the static context, not in dynamic context. For countries like China and Malaysia, there is still a big question of how to get from the current actual fixed exchange rate with the US dollar to other exchange rate regimes. Before adopting the basket-peg or floating regime, these countries need to abandon the actual dollar-peg.\footnote{The Chinese government announced its change in exchange rate system from the dollar-peg system to a managed floating system "with reference to" a currency basket and also with a band (plus and minus 0.3\%) around the base rate on July 21, 2005. However, observing the reference target, weight on the US dollar is very close to 1, implying that the Chinese government is still adopting the actual dollar-peg regime.} On the one hand, the shift from the dollar-peg regime to the basket-peg regime would involve one of two processes: (i) starting with the dollar-peg regime with strict capital control, shifting to the basket-peg regime with loose capital control, and finally reaching the basket-peg regime with no capital control, that is, gradual adjustment of both degree of capital control and basket weight, or (ii) starting with the dollar-peg regime with strict capital control, then suddenly shifting to the basket-peg regime with no capital control by removing capital control, that is, the sudden shift of both capital control and basket weight. On the other hand, the shift to the floating regime would involve the following process: starting with the dollar-peg regime with strict capital control and suddenly shifting to the floating regime by removing capital control. Therefore, it is necessary to analyze the effects of these shifts in the dynamic context.

This paper computes the dynamic effect of the shifts from the fixed exchange rate regime to the basket-peg regime or the floating regime. We obtain two transition paths from the dollar-peg to the basket-peg regime (gradual adjustment and sudden shift) and one transition path from the dollar-peg to the floating regime (sudden shift).

The major findings are as follows. First, value of the cumulative losses of four policies are obtained theoretically as well as empirically. Five policies which we focus in this paper are (1) maintaining the dollar-peg (with strict capital control), (2) gradual shift from the dollar-peg to the basket-peg without capital controls (gradual adjustment of both capital controls and basket weight), (3) sudden shift from the dollar-peg to the basket-peg without capital controls (sudden shift of both capital controls and basket weight), (4) gradual shift from the dollar-peg to the floating regime (gradual transition), and (5) sudden shift from the dollar-peg to the floating regime (sudden transition).
shift from the dollar-peg to the basket-peg without capital controls (sudden removal of capital controls and sudden shift of basket weights) and lastly (4) sudden shift from the dollar-peg to the floating regime (sudden removal of capital controls and sudden increase of flexibility in exchange rate), and (5) sudden shift from the dollar-peg to the managed floating regime (sudden removal of capital controls, sudden increase of flexibility in exchange rate and occasional interventions). We find that maintaining the dollar-peg regime is desirable only in the short term, indicating that the country will be better off shifting to either the basket-peg regime or the floating regime in the long-run.

Second, concerning a choice between gradual adjustment (policy 2) toward the target basket-peg regime or sudden shift to the target basket-peg regime (policy 3), the longer the transition period, the more benefits the country receives from reaching the desired regime at once.

Thirdly, for a comparison between sudden shifts to the basket-peg regime (policy 3) and to the floating regime (policy 4), the welfare of the country would be higher under the shift to the basket-peg regime if the exchange rate fluctuates significantly. The country would be able not only to stabilize negative impacts of exchange rate fluctuations on trades and capital inflows, but also let the private sector formulate exchange rate expectation precisely by committing to the basket regime for certain periods.

Lastly, concerning with shifting to the managed floating, it is less attractive to adopt compared with shifting to the basket-peg. This is due to the fact that intervening into foreign exchange rate market for certain periods leads to higher losses as the authority lacks monetary policy autonomy. Our numerical analysis using Chinese and Thai data support these findings.7

Needless to say, our analysis can be applied to any small open country considering the shift from the fixed regime to the basket-peg or the floating regime.

The paper is related to two streams of literatures. One of these debates the desirability of the basket-peg regime in East Asia. Ito, Ogawa and Sasaki (1998) and Ogawa and Ito (2002) analyze the optimality of the basket-peg with general equilibrium model which does not include capital movements. Yoshino, Kaji, and Suzuki (2004) and Yoshino, Kaji, and Asonuma (2004) also claim that it is better for the country to adopt the basket-peg rather than the dollar-peg regime based on a general equilibrium model that incorporates capital movements across countries. Bird and Rajan (2002) argue that pegging against a more diversified composite basket of currencies would have enabled the Southeast Asian countries to better deal with the third currency phenomenon which contributed to the crisis.8 From other perspectives, Shioji (2006a, 2006b) consider the basket-peg regime under two different invoicing schemes, producer currency pricing and vehicle currency pricing. For empirical analysis, McKibbin and Le (2004) investigate which exchange rate the East Asian countries should peg to using several shocks, which involve country specific (asymmetric) shock, and regional (symmetric) shocks.

Furthermore, the other stream deals with the desirability of the floating regime in the region. Adams and Semblat (2004) emphasize that one of the currency regime options is adopting the floating regime with inflation targeting. Following this argument, Sussangkarn and Vichyanond (2007) mention that the managed floating plus inflation targeting suits the emerging market environment as in Thailand. Furthermore, Yoshino, Kaji and Asonuma (2004) find that the floating regime is also a possible regime for East Asian countries together with the basket-peg regime. Lastly, Kim and Lee (2008) show that the exchange rate flexibility provides greater monetary policy independence based

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7Moreover, Yoshino, Kaji, and Asonuma (2010) analyze the comparison between the basket-peg and floating regimes by implementing some instrument rules. Our numerical analysis shows that in the case of Singapore and Thailand, applying the basket weight rule under the basket-peg regime will lead to a smaller cumulative loss than adopting the interest rate rule or the money supply rule under the floating regime.

8They also note that the composition of the basket of currencies and the weights attached to individuals currencies will need to change as circumstances change and as the significance of major would currencies to a developing country’s balance of payments change.

3
on their empirical findings.

The rest of the paper proceeds as follows. Section 2 provides a small open economy model. Section 3 analyzes how the economy reaches the stable equilibrium under four regimes. Section 4 defines three transition policies together with maintaining the current regime. Section 5 discusses the optimal transition policy the country should take. Section 6 provides simulation results using Chinese and Thai data. A brief conclusion summarizes the discussion.9

2 Small Open-economy Model

In this section, we provide a small open economy model. As in Yoshino, Kaji and Suzuki (2002) and Dornbusch (1976), we conduct a dynamic analysis with small open general equilibrium model. As China is financially a small economy reflected by development of financial market, we consider the analysis based on small open economy.10 Though our equilibrium conditions are not based on optimal behaviors of households and firms, our equilibrium conditions are quite the same with those in Yoshino, Kaji, and Asomuma (2010) which are derived from optimal conditions of households and firms. There are three countries in this model: China, the US, and Japan. We assume China as home country and the US and Japan as the rest of the world (ROW). The yen-dollar exchange rate is exogenous to China.

Note: all the variables except interest rates and exchange rates are defined in natural log.

We assume that domestic and foreign assets are imperfect substitutes whereas US assets and Japanese assets are perfect substitutes for domestic investors. Thus equation of interest parity condition is

\[ i_{t+1} - i_t = \lambda \left[ i_t - \left( i_{US}^{t+1} + e_{t+1}^{R/\$} - e_t^{R/\$} - \sigma(e_t^{R/\$}) \right) \right] \]

where \( \lambda \) denotes the adjustment speed of domestic interest rate, which also expresses the degree of capital control. If \( \lambda \) approaches to 0, it implies that domestic interest rate does not respond to change in foreign interest rate. It means that domestic interest rate is exogenous and totally independent. We regard it as a case of strict capital control. On contrary, if \( \lambda \) approaches to 1, it implies that domestic interest rate responds completely to change in foreign interest rate, which we consider it as a case without capital control. Furthermore, \( \sigma(e_t^{R/\$}) \) denotes a risk premium. It depends on the renminbi-dollar exchange rate. Depreciation of home currency will increase stock of foreign assets held by domestic investors, and reduce domestic interest rate. If \( \lambda = 1 \), equation (1) can be rewritten as

\[ i_{t+1} = i_{US}^t + e_{t+1}^{R/\$} - e_t^{R/\$} - \sigma(e_t^{R/\$}) \]

As we explain later in Section 3.1., under the dollar-peg regime with capital control, equation (1) will not hold.

Equilibrium condition for money market is

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9 It is obvious that the optimal basket weight obtained from our numerical analysis is different from that mentioned in Ogawa and Shimizu (2006), which is computed based on shares in regional GDP measured at Purchasing Power Parity (PPP) and their trade volume shares (sum of the exports and imports).

10 In Appendix C, we consider an extension where the price levels in the US and Japan are highly influenced by the domestic price level.
\[ m_t - p_t = -\epsilon t_{t+1} + \phi (y_t - \bar{y}) \]  

(2)

Assume that demand for goods depends on real exchange rates, exchange rate expectations next period, real interest rate and exchange rate risks shown as

\[ y_t - \bar{y} = \delta (e_t^{R/S} + p_{US} - p_t) + \theta (e_t^{R/yen} + p_{JP} - p_t) + \rho (e_{t+1} - (p_{t+1} - p_t)) \]

\[-\tau \Delta e^{R/S} - \xi \Delta e^{R/yen} \]

(3)

where the term \((p_{t+1}^e - p_t^e)\) shows expected rate of inflation. \(\Delta e^{R/S}\) expresses the renminbi-dollar exchange rate risk and \(\Delta e^{R/yen}\) denotes the renminbi-yen exchange rate risk.

Since one of three exchange rates is not independent, the renminbi-yen rate can be expressed as

\[ e_t^{R/yen} = e_t^{R/S} + e_t^{$/yen} \]

(4)

The inflation rate depends on total productivity, excess demand for goods, the real renminbi-dollar rate, and expected rate of inflation, shown as

\[ p_{t+1} - p_t = -\alpha_t + \psi (y_t - \bar{y}) + \eta (e_t^{R/S} + p_{US} - p_t) + \eta' e_t^{$/yen} + \mu (e_t^{R/yen} + p_{JP} - p_t) + \mu' e_{t+1}^{R/yen, e} + \epsilon (p_{t+1}^e - p_t^e) + \chi \Delta e^{R/S} + \xi \Delta e^{R/yen} \]

(5)

where the first term on right-hand side shows the total productivity of home country and last term denotes the renminbi-dollar exchange rate risk. We assume aggregate production depends on total productivity, imported materials from the US and Japan, and inflation rate. We assume that China imports materials from Japan and the US, exports final goods to Japan and the US. Both aggregate demand and aggregate supply depend also on exchange rate expectations as exporting and importing firms worry about significant deviations of exchange rates next period from the present level.

Among variables, \(\alpha_t, \bar{y}, p_{US}, p_{JP}, e_t^{$/yen}, \Delta e^{R/S}, \) and \(\Delta e^{R/yen}\) are common exogenous variables under any exchange rate regimes. We assume that all exogenous variables except \(e_t^{$/yen}, p_{t+1}^e, p_t^e, e_t^{$/yen, e},\) and \(e_t^{R/Yen, e}\) are constant (=0) in the analysis below. All the coefficients above are positive.

### 3 Exchange rate regimes

In this section, we solve for long-term equilibrium together with equilibrium values at period \(t\). We consider four cases:

(A) Dollar-peg regime with strict capital control,
(B) Basket-peg regime with weak capital control,
(C) Basket-peg regime without capital control and,
(D) Floating regime without capital control

(E) Dollar-peg regime under perfect capital mobility

At first, we start our analysis from case (A) which the Chinese authority adopts the fixed exchange rate with the US dollar and restricts capital movements. Next, we consider case (B) where the authority embraces the basket-peg regime with loose capital control. This assumption reflects a transition period from the fixed exchange rate with capital control to the basket-peg regime with weak capital control, which is a basket composed of the renminbi-dollar and the renminbi-yen rate. Thirdly, we analyze case (C) where China adopts the basket-peg regime without capital control. Case (D) where the authority implements the floating regime without capital control comes next. Finally, we have case (E) where the authority choose the dollar-peg regime under perfect capital mobility.
3.1 Dollar-peg regime with strict capital control (A)

Under the dollar-peg regime, the renminbi-dollar rate ($e_{t}^{R/\$}$) is totally exogenous ($e_{t}^{R/\$} = \bar{e}^{R/\$}$). Thus, expectation of exchange rate will be equal to current exchange rate. Furthermore, in this case, money supply ($m_{t}$) is endogenous, implying that the authority adjusts money supply by intervening to foreign exchange market in order to maintain the US dollar rate constant. Direct impacts of foreign market interventions have been captured mostly through changes in money supply. Since the authority restricts domestic residents' holding foreign assets, equation (1) does not exit. Domestic interest rate ($i_{t+1}$) is policy instrument (exogenous).

As the renminbi-dollar rate remains fixed, from equation (4),

$$e_{t}^{R/\$} = e_{t}^{\$/yen}$$  \hspace{1cm} (4')

Substituting equation (4') into equation (3), we obtain

$$y_{t} - \bar{y} = \delta (-p_{t}) + \theta \left( e_{t}^{\$/yen} - p_{t} \right) + \theta' \epsilon_{t+1}^{\$/yen,e} - \rho \left( p_{t+1}^{e} - p_{t}^{e} \right) - \varsigma \epsilon_{t}^{R/\$}$$  \hspace{1cm} (3')

Endogenous variables in this case are $m_{t}$, $y_{t}$, and $p_{t}$. Solving equation (2), (3'), and (5) for the price level and money supply, we have following equations:

$$p_{t+1} - p_{t} = -\alpha t - [\psi(\delta + \theta) + (\eta + \mu)] p_{t} + \psi e_{t}^{\$/yen} + \phi e_{t+1}^{\$/yen,e} + (1 + \psi \rho) (p_{t+1}^{e} - p_{t}^{e}) + (\xi - \varsigma \epsilon_{t}) \epsilon_{t}^{R/\$} - \psi \rho t_{i+1}$$  \hspace{1cm} (6)

$$m_{t} = [1 - \phi(\delta + \theta) + (\eta + \mu)] p_{t} + \phi e_{t}^{\$/yen} + \phi e_{t+1}^{\$/yen,e} + \phi (p_{t+1}^{e} - p_{t}^{e}) - \varsigma \epsilon_{t}^{R/\$} - (\epsilon + \phi \rho) i_{t+1}$$  \hspace{1cm} (7)

Long-run equilibrium values for the price level and money supply under the dollar-peg regime are\footnote{1}:

$$\bar{p}_{A} = \frac{1}{E_{1}} \left[ (\psi \left( \theta + \theta' \right) + \mu') e^{\$/yen} - \psi \bar{p} - \bar{\alpha} \right]$$  \hspace{1cm} (8)

$$\bar{m}_{A} = \left[ \frac{E'_{1}}{E_{1}} \left( \psi \left( \theta + \theta' \right) + \mu' \right) + \phi(\theta + \theta') \right] e^{\$/yen} - \left( \frac{E'_{1}}{E_{1}} \psi + (\epsilon + \phi \rho) \psi \right) i$$  \hspace{1cm} (9)

where $E_{1} = \psi(\delta + \theta) + (\eta + \mu)$ and $E_{1}^{'} = 1 - \phi(\delta + \theta) + (\eta + \mu)$

We define that $\bar{X}_{t} = X_{t} - \bar{X}$ expresses the deviation from the long-run equilibrium value. We assume the dollar-yen rate moves from its initial equilibrium value ($= 0$) to $e_{t}^{\$/yen}$ at time $t$ and remains at the new equilibrium from period $t + 1$ ($= e_{t}^{\$/yen}$). As the price level is sticky in the short run, $p_{0} = 0$ at time 0. We assume the initial equilibrium values $\bar{p}_{0} = \bar{e}_{0} = 0$. New equilibrium value after the dollar-yen rate change can be expressed as:

$$\bar{p}'_{A} = \frac{1}{E_{1}} \left[ \psi e_{t}^{\$/yen} + (\psi' + \mu') e_{t+1}^{\$/yen,e} + (1 + \psi \rho) (p_{t+1}^{e} - p_{t}^{e}) + (\xi - \varsigma \epsilon_{t}) \epsilon_{t}^{R/\$} - \psi \rho t_{i+1} \right]$$  \hspace{1cm} (10)

where we assume that total productivity remains unchanged by exchange rate shock i.e. $\bar{\alpha}_{t} = 0$.

Solving equation (6) and (3') with rational expectation, we have following expressions for $y_{t} - \bar{y}'_{A}$ and $p_{t} - \bar{p}'_{A}$\footnote{12}:

$$(y_{t} - \bar{y}'_{A}) = A_{1}(t) \bar{e}_{t}^{\$/yen} + A_{2}(t) \epsilon_{t}^{R/\$} + A_{3}(t) i_{t+1}$$  \hspace{1cm} (11)\footnote{11}$$

We assume that $p_{t+1}^{e} = \bar{p}^{e}$, $\Delta e^{\$/yen} = 0$, and $\epsilon_{t}^{\$/yen,e} = \epsilon_{t}^{R/\$}$ at the long-run equilibrium.

We show how to solve for rational expectation and derive equation (11) in Appendix A.1. Expression $A_{1}(t)$, $A_{2}(t)$, $A_{3}(t)$, $A_{4}(t)$, $A_{5}(t)$, and $A_{6}(t)$ are shown in Appendix A.1.
\[ (p_t - \tilde{p}_A^t) = A_1^p(t)e_{t}^{S/\text{yen}} + A_2^p(t)\Delta e^{R/\text{yen}} + A_3^p(t)i_{t+1} \]  

(11a)

Furthermore, we denote deviations of output and the price level from new long-run equilibrium values under the basket-peg regime without capital control (C) as

\[ (y_t - \tilde{y}_A) = (y_t - \tilde{y}_A') + (\tilde{y}_A - \tilde{y}_A') \]

\[ = \{ A_1(t) + A_1'(t) \} e_{t}^{S/\text{yen}} + A_2(t)\Delta e^{R/\text{yen}} + A_2'(t)\Delta e^{R/\text{yen}} + A_3(t)i_{t+1} \]

(11')

\[ (p_t - \tilde{p}_A^t) = (p_t - \tilde{p}_A') + (\tilde{p}_A' - \tilde{p}_A') \]

\[ = \{ A_1^p(t) + A_1'^p(t) \} e_{t}^{S/\text{yen}} + A_2^p(t)\Delta e^{R/\text{yen}} + A_2'^p(t)\Delta e^{R/\text{yen}} + A_3^p(t)i_{t+1} \]

(11'a)

Note that \( \tilde{y}_A \equiv \tilde{y}_C \) and \( \tilde{p}_A' \equiv \tilde{p}_C' \), which are defined in Section 3.3. A clear drawback of the dollar-peg regime with capital control is that capital inflow is restricted and it leads to lower level of long-run equilibrium value compared with that under the basket-peg regime without capital control. On contrary, the country obtains gains in trade by maintaining dollar rate at the fixed level.

### 3.2 Basket-peg regime with weak capital control (B)

As the basket-peg is one of the fixed exchange rate regimes, endogenous variables are the same with the dollar peg regime. In this case, the monetary authority adjusts money supply by intervening in foreign exchange market in order to maintain the value of basket. Thus, impacts of foreign market intervention have been captured through changes in money supply. As aforementioned, basket is a weighted average of the renminbi-dollar rate and the renminbi-yen rate. We have equation (1) together with basket equation, which is

\[ v_{c_t}^{R/\text{yen}} + (1 - v)e_{t}^{R/\text{yen}} = \Gamma \]  

(12)

where \( \Gamma \) is the value of basket. From this equation and equation (4), we can obtain

\[ e_{t}^{R/\text{yen}} = -(1 - v)e_{t}^{S/\text{yen}}, \quad e_{t}^{R/\text{yen}} = ve_{\text{yen}} \]  

(12a)

Substituting equation (12a), we have

\[ y_t - \bar{y} = -\left( \delta + \theta \right)p_t + \{ -\delta(1 - v) + \theta v \} e_{t}^{S/\text{yen}} + \{ -\delta'(1 - v) + \theta'v \} e_{t}^{S/\text{yen}} - \rho i_{t+1} \]  

+ \rho(p_{t+1}^{e} - p_{t}^{e}) - \tau \Delta e^{R/\text{yen}} - \xi \Delta e^{R/\text{yen}} \]  

(3')

Solving equation (1), (3'), and (5) for the price level and interest rate, following semi-reduced form equations are obtained:

\[ p_{t+1} - p_{t} = -\alpha_t - E_1p_t + \{ \psi (\theta v - \delta(1 - v)) \} e_{t}^{S/\text{yen}} - \rho \psi i_{t+1} + (1 + \psi \rho)(p_{t+1}^{e} - p_{t}^{e}) \]

\[ \{ \psi (\theta' v - \delta'(1 - v)) + \mu_1' - \eta(1 - v) \} e_{t+1}^{S/\text{yen},e} + \lambda(1 - \sigma)(1 - v)e_{t}^{S/\text{yen}} \]  

\[ + \lambda(1 - \sigma)(1 - v)e_{t}^{S/\text{yen}} \]  

(13)

\[ i_{t+1} - i_t = -\lambda i_t - \lambda(1 - v)e_{t+1}^{S/\text{yen},e} + \lambda(1 + \sigma)(1 - v)e_{t}^{S/\text{yen}} \]  

(14)

Long-run equilibrium values are shown as

\[ \bar{p}_B = \frac{1}{E_1} \left[ \psi \{ \theta + \theta' \} v - (1 - v)(\delta + \delta' + \rho \sigma) \} - (\eta + \eta')(1 - v)(1 - v) + (\mu + \mu') v \} e_{t}^{S/\text{yen}} - \frac{1}{\hat{\alpha}} \]  

(15)
As in Section 3.1, we assume the same exogenous dollar-yen rate shock. New equilibrium value after the dollar-yen rate change is

\[
p_t' = \frac{1}{E_1} \left\{ \psi \{ \theta v - (1 - v)(\delta + \rho + \rho \sigma) \} + \mu v - \eta(1 - v) \} e_t^{\$/yen} + (1 + \psi \rho) (\hat{p}_{t+1}^c - \hat{p}_t^c) + \psi' v + \eta(1 - v) \} e_{t+1}^{\$/yen,e} + (\chi - \psi \tau) \Delta e^{R/\$} + (\xi - \psi \varsigma) \Delta e^{R/yen} \right\}
\]

(17)

\[
\bar{t}_B' = (1 - v) \left[ (1 + \sigma) e_t^{\$/yen} - e_{t+1}^{\$/yen,e} \right]
\]

(18)

Solving equation (13), (14) and (3") with rational expectation, we have following expressions for \(y_t - \bar{y}'_B\) and \(p_t - \bar{p}'_B\) as well as \((i_t - \bar{i}'_B)\)\(^{13}\)

\[
(y_t - \bar{y}'_B) = B_1(t) v e_t^{\$/yen} + B_2(t) e_t^{\$/yen} + B_3(t) \tilde{z}_t
\]

(19)

\[
(p_t - \bar{p}'_B) = B_p(t) v e_t^{\$/yen} + B_2(t) e_t^{\$/yen} + B_3(t) \tilde{z}_t
\]

(19a)

\[
(i_t - \bar{i}'_B) = -(1 - v) [(1 + \sigma)(1 - b_t)] (1 - \lambda) t e_t^{\$/yen}
\]

(19b)

where \(B_3(t) \tilde{z}_t\) is comprised of \(\Delta \hat{e}^{R/\$}\) and \(\Delta \hat{e}^{R/yen}\) terms.

### 3.3 Basket-peg regime without capital control (C)

Similar to Section 3.2, we have same equation (12a) and (3") in this case as well. Since we assume perfect capital mobility, we have equation (1') with \(\lambda = 1\). Solving equation (1'), (3''), and (5) for the price level and interest rate, following semi-reduced form equations are obtained:

\[
p_{t+1} - p_t = -\alpha_t - E_1 p_t + \psi \{ \theta v - \delta(1 - v) \} + \mu v - \eta(1 - v) \} e_t^{\$/yen} + \psi \hat{p}_{t+1} + (1 + \psi \rho) (\hat{p}_{t+1}^c - \hat{p}_t^c)
\]

\[
\psi \{ \theta v - \delta(1 - v) \} + \mu v - \eta(1 - v) \} e_{t+1}^{\$/yen,e} + (\chi - \psi \tau) \Delta e^{R/\$} + (\xi - \psi \varsigma) \Delta e^{R/yen}
\]

(13)

\[
i_{t+1} = -(1 - v) e_{t+1}^{\$/yen} + (1 + \sigma)(1 - v) e_t^{\$/yen}
\]

(14')

Long-run equilibrium value is derived as

\[
\bar{p}_C = \frac{1}{E_1} \left\{ \psi \{ \theta + \theta' v - (1 - v)(\delta + \delta' + \rho \sigma) \} - \eta(1 - v) + (\mu + \mu' v) e_t^{\$/yen} - \frac{1}{E_1} \alpha \right\}
\]

(20)

\[
\bar{i}_C = (1 - v) \sigma e_t^{\$/yen}
\]

(21)

Note that \(\bar{p}_C = \bar{p}_B\) and \(\bar{i}_C = \bar{i}_B\). As in Section 3.1, we assume the same exogenous dollar-yen rate change. New equilibrium value after the dollar-yen rate change is

\[
\bar{p}_C' = \frac{1}{E_1} \left\{ \psi \{ \theta v - (1 - v)(\delta + \rho + \rho \sigma) \} + \mu v - \eta(1 - v) \} e_t^{\$/yen} + (1 + \psi \rho) (\hat{p}_{t+1}^c - \hat{p}_t^c)
\]

\[
\psi \{ \theta v - \delta(1 - v) \} + \mu v - \eta(1 - v) \} e_{t+1}^{\$/yen,e} + (\chi - \psi \tau) \Delta e^{R/\$} + (\xi - \psi \varsigma) \Delta e^{R/yen}
\]

(22)

\[
\bar{i}_C' = (1 - v) \left[ (1 + \sigma) e_t^{\$/yen} - e_{t+1}^{\$/yen,e} \right]
\]

(23)

\(^{13}\)We show how to solve for rational expectation and derive equation (19) in Appendix A.2. Expression \(B_1(t), B_2(t), B_3(t), B_1^c(t), B_2^c(t),\) and \(B_3^c(t)\) are shown in Appendix A.2.
Solving equation (13), (14’), and (3”) with rational expectation, we have following expressions for $y_t - \bar{y}'_C$ and $p_t - \bar{p}'_C$ such as

$$
(y_t - \bar{y}'_C) = C_1(t)\dot{e}_t^{\$/yen} + C_2(t)\dot{e}_t^{\$/yen} + C_3(t)\dot{z}_t
$$

(24)

$$
(p_t - \bar{p}'_C) = C_1^p(t)\dot{e}_t^{\$/yen} + C_2^p(t)\dot{e}_t^{\$/yen} + C_3^p(t)\dot{z}_t
$$

(24a)

### 3.4 Floating regime without capital control (D)

Under the floating regime, money supply ($m_t$) becomes exogenous. Solving equation (1’), (3) and (5), we obtain following two equations:

$$
e^{R/\$}_{e_t} = \frac{1}{E_2} \begin{bmatrix} -m_t - \{\epsilon - \phi(\delta + \theta)\}p_t + \phi\theta e_t^{\$/yen} + \phi\rho(\bar{p}'_{t+1} - \bar{p}'_t) \\
+ \{\epsilon + \phi\rho + \phi(\delta' + \theta')\} e_{t+1}^{R/\$} + \phi\theta' e_{t+1}^{\$/yen,e} - \phi\tau \Delta e^{R/\$} - \phi\varphi \Delta e^{R/\$} \end{bmatrix}
$$

(25)

$$
p_{t+1} - p_t = -E_3p_t + E_4m_t + E_5e_t^{\$/yen} + E_6(\bar{p}'_{t+1} - \bar{p}'_t) + E_7e_{t+1}^{R/\$} + E_8e_{t+1}^{\$/yen,e} + E_9\Delta e^{R/\$} + E_10\Delta e^{R/\$} - \alpha t
$$

(26)

where $E_2 = (1 + \sigma)(\epsilon + \phi\rho) - 2\phi(\delta + \theta)$.

Long-run equilibrium can be obtained from two following equations:

$$
e^{R/\$}_{e_D} = -\frac{1}{f_4}m - \frac{\epsilon - \phi(\delta + \theta)}{f_4}\bar{p}_D
$$

(27)

$$
\bar{p}_D = \frac{f_6}{f_5}m + \frac{f_7}{f_5}e^{\$/yen} - \frac{1}{f_5}\bar{a}
$$

(28)

where $f_4 = \sigma(\epsilon + \phi\rho) - 2\phi(\delta + \theta)$.

As in Section 3.1, we assume the same exogenous dollar-yen rate shock. New equilibrium values after the dollar-yen rate shock is

$$
e^{R/\$}_{e_D} = \frac{1}{E_3} \begin{bmatrix} -m_t - \{\epsilon - \phi(\delta + \theta)\}\bar{p}_D + \phi\theta e_t^{\$/yen} + \phi\rho(\bar{p}'_{t+1} - \bar{p}'_t) \\
+ \{\epsilon + \phi\rho + \phi(\delta' + \theta')\} e_{t+1}^{R/\$} + \phi\theta' e_{t+1}^{\$/yen,e} - \phi\tau \Delta e^{R/\$} - \phi\varphi \Delta e^{R/\$} \end{bmatrix}
$$

(29)

$$
\bar{p}_D = \frac{1}{E_3} \begin{bmatrix} E_4m_t + E_5e_t^{\$/yen} + E_6(\bar{p}'_{t+1} - \bar{p}'_t) + E_7e_{t+1}^{R/\$} + E_8e_{t+1}^{\$/yen,e} + E_9\Delta e^{R/\$} + E_10\Delta e^{R/\$} \end{bmatrix}
$$

(30)

Solving equation (25), (26) and (3) with rational expectation, we have following expressions for $y_t - \bar{y}'_D$ and $p_t - \bar{p}'_D$ such as

$$
(y_t - \bar{y}'_D) = D_1(t)\dot{e}_t^{\$/yen} + D_2(t)\dot{z}_t + D_3(t)m_t
$$

(31)

$$
(p_t - \bar{p}'_D) = D_1^p(t)\dot{e}_t^{\$/yen} + D_2^p(t)\dot{z}_t + D_3^p(t)m_t
$$

(31a)

---

14We show how to solve for rational expectation and derive equation (24) in Appendix A.3. Expression $C_1(t)$, $C_2(t)$, $C_3(t)$, $C_1^p(t)$, $C_2^p(t)$, and $C_3^p(t)$ are shown in Appendix A.3.

15Details of expression are shown in Appendix A.4.

16We show how to solve for rational expectation and derive equation (31) in Appendix A.3. Expression $D_1(t)$, $D_2(t)$, $D_3(t)$, $D_1^p(t)$, $D_2^p(t)$, and $D_3^p(t)$ are shown in Appendix A.3.
### 3.5 Dollar-peg regime under perfect capital mobility (E)

Similar to Section 3.1, the renminbi-dollar rate \( e^{R/S}_t \) is totally exogenous \( e^{R/S}_t = \bar{e}^{R/S} \), and money supply is endogenous. Under free capital mobility, we have equation (1') and domestic interest rate \( (i_{t+1}) \) is fixed at the level of US interest rate \( (iUS_t) \).

Long-run equilibrium values for the price level and money supply under the dollar-peg regime are:

\[
\bar{p}_E = \frac{1}{E_1} \left[ \{\psi (\theta + \theta') + \mu'\} \bar{e}^{S/yen} - \psi \bar{m} - \bar{\alpha} \right] \\
\bar{m}_E = \left[ \frac{E'_t}{E_1} \{\psi (\theta + \theta') + \phi(\theta + \theta')\} \bar{e}^{S/yen} - \frac{E'_t}{E_1} \bar{\alpha} - \left[ \frac{E'_t}{E_1} \psi \bar{p} + (\epsilon + \phi \rho) \right] \bar{i} \right] 
\]

As in Section 3.1, we assume the same exogenous dollar-yen rate shock. New equilibrium value after the dollar-yen rate change is:

\[
\bar{p}_E' = \frac{1}{E_1} \left[ \psi \theta \bar{e}^{S/yen}_t + (\psi \theta' + \mu')\bar{e}^{S/yen.e}_t + (1 + \psi \rho) \left( \bar{p}'_{t+1} - \bar{p}'_t \right) + (\xi - \psi \zeta) \Delta \bar{e}^{R/yen}_t \right] 
\]

Solving equations as in Section 3.1, we have following expressions for \( y_t - \bar{y}'_E \) and \( p_t - \bar{p}'_E \):

\[
(y_t - \bar{y}'_E) = A_1(t)\bar{e}^{S/yen}_t + A_2(t)\Delta \bar{e}^{R/yen}_t \\
(p_t - \bar{p}'_E) = A'_1(t)\bar{e}^{S/yen}_t + A'_2(t)\Delta \bar{e}^{R/yen}_t
\]

### 4 Transition path to other exchange rate regimes

In this section, we define four transition policies. Based on results of static analysis shown by Yoshino, Kaji and Suzuki (2004), we denote desirable regime is either the basket-peg regime without capital control \( (C) \) or the floating regime without capital control \( (D) \) in the long-term perspective.\(^{17}\) We consider following three transition paths to the preferred regimes and maintaining the status quo such as the dollar-peg regime with capital control \( (A) \).

1. Maintaining the dollar-peg (with strict capital control) \((A)- (A)- (A)\)
2. Gradual shift from the dollar-peg to the basket-peg without capital controls (gradual adjustment of both capital controls and basket weight) \((A)- (B)- (C)\)
3. Sudden shift from the dollar-peg to the basket-peg without capital controls (sudden removal of capital controls and sudden shift of basket weights) \((A)- (C)- (C)\)
4. Sudden shift from the dollar-peg to the floating regime (sudden removal of capital controls and sudden increase of flexibility in exchange rate) \((A)- (D)- (D)\)
5. Sudden shift from the dollar-peg to the managed floating regime (sudden removal of capital controls and sudden increase of flexibility of exchange rate with occasional intervention) \((A)- (D)- (E)- (D)\)

\[\text{[Insert Figure 2]}\]

\(^{17}\)We assume that \( p'_{t+1} = \bar{p}_t, \Delta \bar{e}^{S/yen} = 0, \text{and} \ e^{R/yen.e}_{t+1} = \bar{e}^{R/yen} \) at the long-run equilibrium.

\(^{18}\)Yoshino, Kaji, and Suzuki (2004) show that for small open economy like Thailand, it would be desirable to adopt basket-peg or floating rather than dollar-peg under static analysis. Furthermore, Yoshino, Kaji, and Asonuma (2004) find that it is also the case under static two-country general equilibrium model.
The first policy is sustaining the dollar-peg regime. The monetary authority restricts capital control and fixes a weight on the dollar rate to 1. Next, the second one is that it includes the transition period (B), which reflects the adjustment period of capital control and basket weights. It starts from the dollar-peg regime and undergoes the transition period (B) and at the end, arrives at the basket-peg regime without capital control (C).

The third is that it does not includes the transition period (B), so therefore, the monetary authority shifts from the dollar-peg regime to the basket-peg regime without transition period, implying the economy will jump to the floating regime. Finally, the last is that it shifts from the dollar-peg regime to the managed floating without transition period. Under the managed floating regime, if the exchange rate fluctuation is remarkably large, the monetary authority intervenes into foreign exchange market to maintain the exchange rate at the fixed rate (E). Otherwise, it lets exchange rate fluctuated as the exchange rate does not deviate significantly from the desired level.

We assume that time interval for initial dollar-peg regime is $T_0$. Furthermore, we regard the transition period as $T_1$ and the time interval after the authority reach the target regime as $T_2$. We assume that discount factor is $\beta$. Figure 2 displays the four policies respectively. Throughout this section, we suppose that the monetary authority aims to minimize output fluctuation. We also derive the cumulative loss for stabilization of the price level in footnotes in each subsection.

### 4.1 Maintaining the dollar-peg regime

In this subsection, we derive the cumulative loss for maintaining the dollar-peg regime. The country keeps the dollar-peg regime for the entire time period $T_0 + T_1 + T_2$. The cumulative loss for sustaining the dollar-peg for $T_1 + T_2$ after the initial dollar-peg period $T_0$ and optimal interest rate are expressed as follows.\(^{19}\)

$$L_1(i^*, T_1 + T_2) = \sum_{t=1}^{T_0} \beta^{t-1}(y_t - \bar{y}_A)^2 + \sum_{t=T_0+1}^{T_0+T_1+T_2} \beta^{t-1}(y_t - \bar{y}_A)^2$$

$$= \sum_{t=1}^{T_0} \beta^{t-1}(y_t - \bar{y}_A)^2 + \sum_{t=T_0+1}^{T_0+T_1+T_2} \beta^{t-1} \left[ \{A_1(t) + A'_1(t)\} \hat{e}_t^{\$} + A_2(t) \Delta \hat{e}^{\$} + A_3(t) i^* \right]^2$$

$$i^* = \arg\min \sum_{t=1}^{T_0+T_1+T_2} \beta^{t-1}(y_t - \bar{y}_A)^2$$

where $(y_t - \bar{y}_A) = [A_1(t) \hat{e}_t^{\$} + A_2(t) \Delta \hat{e}^{\$} + A_3(t) i^*]$. Note that $i^*$ is chosen to minimize the cumulative loss in term of deviation from its stable equilibrium value under the dollar-peg regime.

\(^{19}\)The cumulative loss evaluated in term of deviation of the price level from the steady state level is shown as follows;

$$L_1^p(i^*_p, T_1 + T_2) = \sum_{t=1}^{T_0} \beta^{t-1}(p_t - \bar{p}_A)^2 + \sum_{t=T_0+1}^{T_0+T_1+T_2} \beta^{t-1}(p_t - \bar{p}_A)^2$$

where

$$i^*_p = \arg\min \sum_{t=1}^{T_0+T_1+T_2} \beta^{t-1}(p_t - \bar{p}_A)^2$$
4.2 Gradual adjustment to the basket-peg without capital controls

In this subsection, we first define a cumulative loss for policy (2) with transition period. Then we derive the optimal weight of basket which the monetary authority sets as a goal under the basket-peg regime without capital control.

First, we express the optimal basket weight as $v^*$ assuming that $0 \leq v^* \leq 1$. As we mentioned above, the monetary authority starts with adopting the dollar-peg regime with capital control (A), indicating that basket weight is equal to 1. Then it shifts to the basket-peg regime and gradually loose the degree of capital control under regime (B). At the same time, the monetary authority decreases its weight by $\frac{1-v^*}{T_1}$ each period during the transition period in order to arrive at $v^*$ when it reaches the basket-peg regime without capital control. Once the monetary authority adopts the target basket-peg regime, it maintains the optimal basket weight ($v^*$). The cumulative loss of transition policy (2) with optimal basket weight $v^*$, transition period $T_1$, and target regime period $T_2$, and can be expressed as

$$L_2(v^*, T_1, T_2) = \sum_{t=1}^{T_0} \beta^{t-1}(y_t - \tilde{y}_A)^2 + \sum_{t=T_0+1}^{T_0+T_1} \beta^{t-1}(y_t - \tilde{y}_B)^2 + \sum_{t=T_0+T_1+1}^{T_0+T_1+T_2} \beta^{t-1}(y_t - \tilde{y}_C)^2$$

$$= \sum_{t=1}^{T_0} \beta^{t-1}(y_t - \tilde{y}_A)^2 + \sum_{t=T_0+1}^{T_0+T_1} \beta^{t-1} \left[ B_1(t)v(t)\hat{e}_t^{\$/yen} + B_2(t)\hat{e}_t^{\$/yen} + B_3(t)\hat{z}_t \right]^2$$

$$+ \sum_{t=T_0+T_1+1}^{T_0+T_1+T_2} \beta^{t-1} \left[ C_1(t)v^*\hat{e}_t^{\$/yen} + C_2(t)\hat{e}_t^{\$/yen} + C_3(t)\hat{z}_t \right]^2$$

(33)

where $(y_t - \tilde{y}_A) = \left[ A_1(t)\hat{e}_t^{\$/yen} + A_2(t)\Delta \hat{e}^{\$/yen} + A_3(t)v^* \right]$ and $v(t) = 1 - \frac{1-v^*}{T_1}(t - T_0)$. Note that the second and the third terms on right-hand side of equation (33) show losses under transition periods and losses under the basket-peg regime (C) respectively.

We differentiate the cumulative loss $L_2(v^*, T_1, T_2)$ respect to $v^*$ and obtain the optimal basket weight as

$$v^* = -\frac{1}{H_1} \left[ \sum_{t=T_0+1}^{T_0+T_1} \frac{T_0}{T_1} \beta^{t-1} \left( B_1(t)\hat{e}_t^{\$/yen} \left( \frac{T_0-t}{T_1} \right) + B_2(t)\hat{e}_t^{\$/yen} + B_3(t)\hat{z}_t \right) \right]^2$$

(34)

where $H_1 = \left[ \sum_{t=T_0+T_1+1}^{T_0+T_1+T_2} \beta^{t-1} \left( C_1(t)\hat{e}_t^{\$/yen} \right)^2 \right] + \sum_{t=T_0+T_1+2}^{T_0+T_1+T_2} \beta^{t-1} \left( C_1(t)\hat{e}_t^{\$/yen} \right)^2$

$^{20}$The cumulative loss evaluated in term of deviation of the price level from its steady-state level is defined as follows;

$$L_2^p(v^*_p, T_1, T_2) = \sum_{t=1}^{T_0} \beta^{t-1}(p_t - \tilde{p}_A)^2 + \sum_{t=T_0+1}^{T_0+T_1} \beta^{t-1}(p_t - \tilde{p}_B)^2 + \sum_{t=T_0+T_1+1}^{T_0+T_1+T_2} \beta^{t-1}(p_t - \tilde{p}_C)^2$$

$$= \sum_{t=1}^{T_0} \beta^{t-1}(p_t - \tilde{p}_A)^2 + \sum_{t=T_0+1}^{T_0+T_1} \beta^{t-1} \left[ B_1^p(t)v(t)\hat{e}_t^{\$/yen} + B_2^p(t)\hat{e}_t^{\$/yen} + B_3^p(t)\hat{z}_t \right]^2$$

$$+ \sum_{t=T_0+T_1+1}^{T_0+T_1+T_2} \beta^{t-1} \left[ C_1^p(t)v^*_p\hat{e}_t^{\$/yen} + C_2^p(t)\hat{e}_t^{\$/yen} + C_3^p(t)\hat{z}_t \right]^2$$

(33a)

where $(p_t - \tilde{p}_A) = \left[ A_1^p(t)\hat{e}_t^{\$/yen} + A_2^p(t)\Delta \hat{e}^{\$/yen} + A_3^p(t)v^*_p \right]$, $v_p(t) = 1 - \frac{1-v^*_p}{T_1}(t - T_0)$ and $v^*_p$ is optimal basket weight for the transition policy of stabilizing the price level.
4.3 Sudden shift to the basket-peg without capital control

In this sub-section, we first define a cumulative loss for transition policy (3) with sudden shift. Then, we calculate an optimal basket weight under the desired basket-peg, which is different from one derived in previous subsection.

First of all, we denote the optimal basket weight as $v^{**}$ under the target basket-peg regime. As we mentioned above, the monetary authority starts with the dollar-peg regime with capital control (A) implying that basket weight is fixed at 1, and suddenly shifts to the basket-peg regime implementing the optimal weight ($v^{**}$) with no capital control (C). The cumulative loss for policy (3) with optimal basket weight $v^{**}$ and target regime period $T_1 + T_2$ is shown as follows:

$$L_3 \left( v^{**}, T_1 + T_2, \hat{e}_t^{R/S,2} \right) = \sum_{t=1}^{T_2} \beta^{t-1} (y_t - \hat{y}_A)^2 + \sum_{t=T_0+1}^{T_0+T_1+T_2} \beta^{t-1} (y_t - \hat{y}_C)^2$$

$$= \sum_{t=1}^{T_2} \beta^{t-1} (y_t - \hat{y}_A)^2 + \sum_{t=T_0+1}^{T_0+T_1+T_2} \beta^{t-1} \left[ C_1(t) v^{**} \hat{e}_t^{$/yen$} + C_2(t) \hat{e}_t^{$/yen$} + C_3(t) \hat{z}_t \right]^2$$

where $(y_t - \hat{y}_A) = \left[ A_1(t) \hat{e}_t^{$/yen$} + A_2(t) \Delta \hat{e}^{R/yen} + A_3(t) i^* \right]$ and impacts of exchange rate volatility after the shift are included in the second terms on the right-hand side of equation (35). $e_t^{R/S,2} = \sum_{t=T_0+T_1+T_2}^{t} \beta^{t-1} \left( \hat{e}_t^{R/S} \right)^2$ is denoted as a sum of discounted squares of dollar exchange rates.

We differentiate the cumulative loss respect to $v^{**}$ and acquire the optimal weight as

$$v^{**} = -\frac{1}{H_2} \left[ \sum_{t=T_0+1}^{T_0+T_1+T_2} \beta^{t-1} C_1(t) \hat{e}_t^{$/yen$} \left( C_2(t) \hat{e}_t^{$/yen$} + C_3(t) \hat{z}_t \right) \right]$$

where $H_2 = \left[ \sum_{t=T_0+1}^{T_0+T_1+T_2} \beta^{t-1} \left( C_1(t) \hat{e}_t^{$/yen$} \right)^2 \right]$

Comparing with a basket weight obtained in section 4.2., $v^{**}$ is different from $v^*$ as long as $T_1 \neq 0$. This is because $v^{**}$ is a weight which minimizes cumulative loss under the basket-peg regime without capital controls, while $v^*$ is a weight which minimizes sum of discounted losses under transition period and desired basket-peg regime period.

4.4 Sudden shift from dollar-peg to the floating regime

Then, we calculate the cumulative loss for policy (4) which the monetary authority shifts from the dollar-peg regime to the floating regime (D) without transition period. We assume the optimal money supply under the floating regime as $m^*$. The monetary authority starts with adopting the dollar-peg

$$L_3 \left( v^{**}, T_1 + T_2, \hat{e}_t^{R/S,2} \right) = \sum_{t=1}^{T_2} \beta^{t-1} (p_t - \tilde{p}_A)^2 + \sum_{t=T_0+1}^{T_0+T_1+T_2} \beta^{t-1} (p_t - \tilde{p}_C)^2$$

$$= \sum_{t=1}^{T_2} \beta^{t-1} (p_t - \tilde{p}_A)^2 + \sum_{t=T_0+1}^{T_0+T_1+T_2} \beta^{t-1} \left[ C_1(t) v^{**} \hat{e}_t^{$/yen$} + C_2(t) \hat{e}_t^{$/yen$} + C_3(t) \hat{z}_t \right]^2$$

where $(p_t - \tilde{p}_A) = \left[ A_1^p(t) \hat{e}_t^{$/yen$} + A_2^p(t) \Delta \hat{e}^{R/yen} + A_3^p(t) i^*_p \right]$ and $v^{**}_p$ is the optimal weight for stabilizing the price level.
regime with capital control (A), and suddenly it jumps to the floating regime without capital control. The cumulative loss under policy (4) with target regime period \( T_1 + T_2 \) and optimal money supply \( m^* \) is shown as follows,\(^{22}\)

\[
L_4 \left( m^*, T_1 + T_2, e^{R/\$/2}_t \right) = \sum_{t=1}^{T_0} \beta^{t-1} (y_t - y'_A)^2 + \sum_{t=T_0+1}^{T_0+T_1+T_2} \beta^{t-1} (y_t - y'_D)^2 
\]

\[
= \sum_{t=1}^{T_0} \beta^{t-1} (y_t - y'_A)^2 + \sum_{t=T_0+1}^{T_0+T_1+T_2} \beta^{t-1} \left[ D_1(t)e^{$/yen}_t + D_2(t)\hat{z}_t + D_3(t)m^* \right]^2 
\]

where \((y_t - y'_A) = [A_1(t)e^{$/yen}_t + A_2(t)\Delta\hat{e}^{R/\$/2}_t + A_3(t)\hat{e}^*] \) and impacts of exchange rate volatility associated with the shift are included in the second term on the right-hand side of equation (37).

We again differentiate this cumulative loss respect to \( m^* \) and obtain an optimal money supply, such as

\[
m^* = -\frac{1}{H_3} \left[ \sum_{t=T_0+1}^{T_0+T_1+T_2} \beta^{t-1} D_3(t) \left( D_1(t)e^{$/yen}_t + D_2(t)\hat{z}_t \right) \right] 
\]

where \( H_3 = \left[ \sum_{t=T_0+1}^{T_0+T_1+T_2} \beta^{t-1} (D_3(t))^2 \right] \)

4.5 Sudden shift from dollar-peg to the managed floating

Lastly, we calculate the cumulative loss for policy (5) which the monetary authority shifts from the dollar-peg regime to the managed floating without transition periods. Under the managed floating regime, the authority intervenes into foreign exchange market when the dollar rate remarkably deviates from desired level. Otherwise, it lets the dollar rate fluctuate under perfect capital mobility.

We denote the optimal money supply under the floating regime as \( m^{**} \). The monetary authority starts with adopting the dollar-peg regime with capital control (A), and it suddenly shifts to the floating regime without capital control. Occasionally when the dollar rate fluctuates significantly, it intervenes into the foreign exchange market to maintain the dollar rate at the constant level under perfect capital mobility (E). After fluctuation of the dollar rate moderates, it resumes adopting floating regime. These interventions are implemented only temporarily to avoid large fluctuations of exchange rate. The cumulative loss under policy (5) with whole period \( T_1 + T_2 \), period of the floating

\(^{22}\)The cumulative loss for stabilizing the price level is defined as follows;

\[
L_4^{\rho} \left( m^*_p, T_1 + T_2, e^{R/\$/2}_t \right) = \sum_{t=1}^{T_0} \beta^{t-1} (p_t - \bar{p}^{\rho}_A)^2 + \sum_{t=T_0+1}^{T_0+T_1+T_2} \beta^{t-1} (p_t - \bar{p}^{\rho}_D)^2 
\]

\[
= \sum_{t=1}^{T_0} \beta^{t-1} (p_t - \bar{p}^{\rho}_A)^2 + \sum_{t=T_0+1}^{T_0+T_1+T_2} \beta^{t-1} \left[ D_1^{\rho}(t)e^{$/yen}_t + D_2^{\rho}(t)\hat{z}_t + D_3^{\rho}(t)m^*_p \right]^2 
\]

where \((p_t - \bar{p}^{\rho}_A) = [A_1^{\rho}(t)e^{$/yen}_t + A_2^{\rho}(t)\Delta\hat{e}^{R/\$/2}_t + A_3^{\rho}(t)\hat{e}^*] \) and \( m^*_p \) is optimal money supply for stabilizing the price level.

14
$T_D$, temporal period of the dollar-peg $T_E$ is shown as follows:  

$$L_5 \left( m^{**}, T_1 + T_2, T_D, T_E, \hat{e}_{t,E}^{R/\$} \right) = \sum_{t=1}^{T_0} \beta^{t-1}(y_t - \bar{y}_A)^2 + \sum_{t=T_0+1}^{T_0+T_D} \beta^{t-1}(y_t - \bar{y}_D)^2 + \sum_{t=T_D+T_E}^{T_0+T_D+T_E} \beta^{t-1}(y_t - \bar{y}_E)^2$$

where \((y_t - \bar{y}_A) = \left[ A_1(t) \hat{e}_t^{\$/yen} + A_2(t) \Delta \hat{e}^{R/\$} + A_3(t)i^* \right]\) and \((y_t - \bar{y}_E) = \left[ A_1(t) \hat{e}_t^{\$/yen} + A_2(t) \Delta \hat{e}^{R/\$} \right]\).

\(e^{R/\$} = \sum_{t=T_D+T_E}^{T_0+T_D+T_E} \beta^{t-1} \left( \hat{e}_t^{R/\$} \right)^2\) is defined as a sum of discounted squares of dollar exchange rates during intervention periods. Impacts of exchange rate volatility associated with the shift are included in the second on the right-hand side of equation (39).

We again differentiate this cumulative loss respect to \(m^{**}\) and obtain an optimal money supply, such as

$$m^{**} = -\frac{1}{H_4} \left[ \sum_{t=T_0+1}^{T_0+T_D} \beta^{t-1}D_3(t) \left( D_1(t) \hat{e}_t^{\$/yen} + D_2(t) \hat{e}_t \right) + \sum_{t=T_D+T_E+1}^{T_0+T_D+T_E} \beta^{t-1}D_3(t) \left( \sum_{t=T_D+T_E+1}^{T_0+T_D+T_E} \beta^{t-1} \left( D_3(t) \right)^2 \right) \right]$$

where \(H_4 = \left[ \sum_{t=T_0+1}^{T_0+T_D} \beta^{t-1} \left( D_3(t) \right)^2 + \sum_{t=T_D+T_E+1}^{T_0+T_D+T_E} \beta^{t-1} \left( D_3(t) \right)^2 \right].\) Comparing with an optimal money supply obtained in section 4.4, \(m^{**}\) is different from \(m^*\) as long as \(T_E \neq 0\).

## 5 Comparison of cumulative losses

In this section, we consider optimal policy for the monetary authority to stabilize output fluctuation. Our discussion centers on two questions throughout this section: one is whether it is desirable to maintain the dollar-peg regime for the monetary authority in the long-term perspective and the other is what would be an optimal policy, given that the authority gains benefits of deviating from the status quo regime. We proceed our argument in three steps. At an initial step, we apply some implications from static analysis into this dynamic context. Then, we compare cumulative loss of current policy (policy (1)), with other transition policies to preferred basket-peg regime or floating regime. After we find that the dollar-peg is not suitable in the long-run, we analyze an optimal outcome for the authority among three transitional policies.

---

23 The cumulative loss for stabilizing the price level is defined as follows;

$$L_5^p \left( m^{**}, T_1 + T_2, T_D, T_E \right) = \sum_{t=1}^{T_0} \beta^{t-1}(p_t - p_{A,t})^2 + \sum_{t=T_0+1}^{T_0+T_D} \beta^{t-1}(p_t - p_{D,t})^2 + \sum_{t=T_D+T_E}^{T_0+T_D+T_E} \beta^{t-1}(p_t - p_{E,t})^2$$

where \((p_t - p_{A,t}) = \left[ A_1(t) \hat{e}_t^{\$/yen} + A_2(t) \Delta \hat{e}^{R/\$} + A_3(t)i^* \right]\) and \((p_t - p_{E,t}) = \left[ A_1(t) \hat{e}_t^{\$/yen} + A_2(t) \Delta \hat{e}^{R/\$} \right]\). \(m^{**}\) is optimal money supply for stabilizing the price level.

24 Discussion concerning stabilizing the price level is also provided in the footnotes.
5.1 Implications from static analysis

First of all, we reflect some implications from static analysis in this subsection. Using a static small open-economy general equilibrium model, Yoshino, Kaji, and Suzuki (2004) show that it is not desirable for the country to adopt the dollar-peg compared with the basket-peg or the floating regimes: 25 value of welfare loss under the dollar-peg is higher than those under the basket-peg or the floating regime at the steady state.

We can express these implications by using one-period losses in this model as follows 26:

\[(y_t - \bar{y}_A^t) > (y_t - \bar{y}_C^t)\] (41)
\[(y_t - \bar{y}_A^t) > (y_t - \bar{y}_D^t)\] (42)

Note that these results hold under regimes which have been sustained for certain periods.

5.2 Comparison of policy (1) and other transition policies

In this subsection, we discuss desirability of the dollar-peg in the long-term by comparing policy (1) with other transition policies to the basket-peg or the floating regime. We start with a contrast between maintaining the dollar-peg (policy (1)) and a sudden shift to the basket-peg regime without capital control (policy (3)). We denote a threshold time period \( T^*_C \) such that

\[L_1(i^*, T^*_C) = L_3(v^{**}, T^*_C, \bar{e}_t^{R/S.2})\]

showing a time interval under which cumulative loss of maintaining the dollar-peg is equal to that of shift to the basket-peg. Taking into account that equation (39) holds during desired regime period 27, we obtain following statements:

\[L_1(i^*, t) < L_3(v^{**}, t, \bar{e}_t^{R/S.2}) \quad \text{if } t < T^*_C\] (43)
\[L_1(i^*, t) > L_3(v^{**}, t, \bar{e}_t^{R/S.2}) \quad \text{if } t > T^*_C\]

It means that if \( t \) is shorter than the threshold time period \( T^*_C \), then cumulative loss of maintaining the dollar-peg is smaller than that of shift to the basket-peg. This could happen if excessive exchange

25 Furthermore, Yoshino, Kaji, and Asonuma (2004) derive the same implication under a static two-country general equilibrium model.
26 Similarly, we can express these implications by using one-period losses in term of the deviation of the price level from the steady state as follows:
\[(p_t - \bar{p}_A^t) > (p_t - \bar{p}_C^t)\] (39a)
\[(p_t - \bar{p}_A^t) > (p_t - \bar{p}_D^t)\] (40a)

27 For the price level stability, a similar statement will be satisfied;
\[L^*_1(i^*, t) < L^*_3(v^{**}, t, \bar{e}_t^{R/S.2}) \quad \text{if } t < T^*_C\]
\[L^*_1(i^*, t) > L^*_3(v^{**}, t, \bar{e}_t^{R/S.2}) \quad \text{if } t > T^*_C\]

where
\[L^*_3(v^{**}, T^*_C, \bar{e}_t^{R/S.2}) = L^*_3(v^{**}, T^*_C, \bar{e}_t^{R/S.2})\]
rate volatility affects negatively to the economy through financial and trade linkages\textsuperscript{28}. On contrary, if \( t \) is longer than the threshold time period \( T_C \), then cumulative loss of maintaining the dollar-peg regime is higher than that of transition policy to the basket-peg regime. We can interpret it as longer the time period of adopting the basket-peg, larger benefits the country would obtain from shifting to basket-peg regime as shown in equation (35).

Similar arguments can be applied to a choice between maintaining the dollar-peg (1) and shift to the floating (4). We define a threshold time period \( T_D^* \) such that

\[
L_1(i^*, T_D^*) = L_4\left(m^*, T_D^*, e_t R/\$^{2}\right)
\]

denoting time interval under which cumulative loss of maintaining the dollar-peg is equal to one of shift to the floating regime. Reflecting that equation (40) holds during desired regime period after the shift, similar conditions hold;\textsuperscript{29}

\[
L_1(i^*, t) < L_4\left(m^*, t, e_t R/\$^{2}\right) \quad \text{if } t < T_D^* \tag{44}
\]

\[
L_1(i^*, t) > L_4\left(m^*, t, e_t R/\$^{2}\right) \quad \text{if } t > T_D^*
\]

These imply that longer the period of adopting the floating regime, the more gains the country can obtain from shifting to the floating regime as shown in equation (40).

Summarizing the results mentioned above, maintaining the dollar-peg regime is desirable only in the short-term, i.e. \( t < Min\left[T_C, T_D^*\right] \).\textsuperscript{30} As the target time period gets longer, the country would be better off shifting to the dollar-peg or the floating regime.

\subsection*{5.3 Comparison among transition policies}

We now examine an optimal choice among three transition policies, given that it is appropriate to depart from the dollar-peg regime. There are costs and benefits associated with three transition policies (2), (3), (4), and (5) as shown in Table 2. For each component of costs, we provide estimates of both Chinese and Thai cases based on quantitative analysis in Table 3.

\[\text{[Insert Table 2 here]}\]
\[\text{[Insert Table 3 here]}\]

Moreover, these benefits and costs are taken into account by evaluating cumulative losses expressed by equation (33), (35), (37), (39). We compare welfare losses between gradual adjustment to the basket-peg (policy (2)) and sudden shift to the basket-peg (policy (3)). Given time period \( T_0 \) and \( T_2 \), we define \( T_1^* \) such that

\begin{itemize}
\item As we explain in section 4.3, effect of large exchange rate fluctuations due to the shift are captured in cumulative loss of policy (3). Thus, in short horizon, loss of sustaining the current regime is smaller than that of policy (3) because the monetary authority can successfully avoid exchange rate fluctuations by fixing the exchange rate.
\item For the price level stability, the similar conditions will be satisfied;
\item For the case of the price stability, \( t < Min\left[T_C^p, T_D^p\right] \)
\end{itemize}

\textsuperscript{28}As we explain in section 4.3, effect of large exchange rate fluctuations due to the shift are captured in cumulative loss of policy (3). Thus, in short horizon, loss of sustaining the current regime is smaller than that of policy (3) because the monetary authority can successfully avoid exchange rate fluctuations by fixing the exchange rate.

\textsuperscript{29}For the price level stability, the similar conditions will be satisfied;

\[
L_1^p(i^*, t) < L_4^p\left(m^*, t, e_t R/\$^{2}\right) \quad \text{if } t < T_D^{p}\]

\[
L_1^p(i^*, t) > L_4^p\left(m^*, t, e_t R/\$^{2}\right) \quad \text{if } t > T_D^{p}\]

where

\[
L_1^p(i^*, T_D^{p}) = L_4^p\left(m^*, T_D^{p}, e_t R/\$^{2}\right)
\]

\textsuperscript{30}For the case of the price stability, \( t < Min\left[T_C^{p}, T_D^{p}\right] \)
L_2 (v^*, T_1^*, T_2) = L_3 (v^{**}, T_1^* + T_2, \varepsilon_t^{R/\$;2})
reflecting the time interval for transition period under which cumulative loss of gradual adjustment policy is equal to one of sudden shift policy to basket-peg. Based on the fact that terms in L_3 (v^{**}, T_1 + T_2) includes high volatility of exchange rate and interest rate due to the shift, it is apparent that following results will hold:

L_2 (v^*, T_1, T_2) < L_3 (v^{**}, T_1 + T_2, \varepsilon_t^{R/\$;2}) \quad \text{if} \quad T_1 < T_1^*

(45)

L_2 (v^*, T_1, T_2) > L_3 (v^{**}, T_1 + T_2, \varepsilon_t^{R/\$;2}) \quad \text{if} \quad T_1 > T_1^*

It implies that longer the transition period of adjustment, more welfare gains the country can have from reaching the target regime suddenly. On contrary, as long as interval for transition period is in the certain range, T_1 < T_1^*, the monetary authority would take advantages of avoiding large fluctuations of exchange rates.

Next, we contrast the welfare policy (3) to that of policy (4). Given time period T_0, T_1^*, T_2 and optimal basket weight v^{**}, monetary supply m^*, we define \varepsilon_t^{R/\$;2} such that

L_3 (v^{**}, T_1 + T_2, \varepsilon_t^{R/\$;2}) = L_4 (m^*, T_1 + T_2, \varepsilon_t^{R/\$;2})
reflecting a sum of discounted squares of dollar exchange rate which cumulative loss of shifting to the basket is equal to that of sudden shift to the floating regime. If the exchange rate fluctuates significantly, the country enjoys higher welfare by committing to basket-peg through stabilizing negative impacts of exchange rate fluctuations on trade and capital flows and minimizing the unexpected deviation of exchange rate expectations. Thus, following statements hold:

L_3 (v^{**}, T_1 + T_2, \varepsilon_t^{R/\$;2}) < L_4 (m^*, T_1 + T_2, \varepsilon_t^{R/\$;2}) \quad \text{if} \quad \varepsilon_t^{R/\$;2} > \varepsilon_t^{R/\$;2*}

(46)

L_3 (v^{**}, T_1 + T_2, \varepsilon_t^{R/\$;2}) > L_4 (m^*, T_1 + T_2, \varepsilon_t^{R/\$;2}) \quad \text{if} \quad \varepsilon_t^{R/\$;2} < \varepsilon_t^{R/\$;2*}

It shows clearly that the country will be better offf choosing a sudden shift to the basket-peg rather than to the floating regime, given large exchange rate fluctuations. On contrary, if size of exchange rate fluctuations is relatively modest, the authority would be better offf adopting the floating regime.

Lastly, we consider whether it is desirable to shift to the managed floating rather (5) than the free floating (4). Given time period T_0, T_1 + T_2, T_D, T_E, monetary supply m^* and m^{**}, exchange rates for the whole period \varepsilon_t^{R/\$;2}, we define \varepsilon_t^{R/\$;2*} such that

L_5 (m^{**}, T_1 + T_2, T_D, T_E, \varepsilon_t^{R/\$;2*}) = L_4 (m^*, T_1 + T_2, \varepsilon_t^{R/\$;2*})

^31 For the case of the price level stability, the similar statements will hold as follows:

L_2^p (v^*_p, T_1, T_2) < L_3^p (v^{**}_p, T_1 + T_2, \varepsilon_t^{R/\$;2}) \quad \text{if} \quad T_1 < T_1^*_p

L_2^p (v^*_p, T_1, T_2) > L_3^p (v^{**}_p, T_1 + T_2, \varepsilon_t^{R/\$;2}) \quad \text{if} \quad T_1 > T_1^*_p

where

L_2^p (v^*_p, T_1^*_p, T_2) = L_3^p (v^{**}_p, T_1^*_p + T_2, \varepsilon_t^{R/\$;2})
reflecting a sum of discounted squares of dollar exchange rate during intervention periods which cumulative loss of shifting to the managed floating is equal to that of shift to the free floating regime. If the exchange rate fluctuates remarkably during the short periods, the country will be better of intervening to avoid the negative impacts of the exchange rate swing on trade and capital flow. This can be expressed as:

\[ L_5 \left( m^{**, T_1 + T_2, T_D, T_E, \epsilon_{t,E}^{R_{/2,2**}} \right) < L_4 \left( m^{*, T_1 + T_2, \epsilon_{t,E}^{R_{/2,2**}} \right) \quad \text{if} \quad \epsilon_{t,E}^{R_{/2,2**}} > \epsilon_{t,E}^{R_{/2,2**}} \] (47)

\[ L_5 \left( m^{**, T_1 + T_2, T_D, T_E, \epsilon_{t,E}^{R_{/2,2**}} \right) > L_4 \left( m^{*, T_1 + T_2, \epsilon_{t,E}^{R_{/2,2**}} \right) \quad \text{if} \quad \epsilon_{t,E}^{R_{/2,2**}} < \epsilon_{t,E}^{R_{/2,2**}} \]

Thus, it is desirable for the country to shift to the managed floating rather than to the free floating regime, given large exchange rate fluctuations during the short periods of interventions. On contrary, if size of exchange rate fluctuations during the short period is relatively small, the country will be better off shifting to the free floating regime to take advantage of having monetary policy autonomy for whole period.

For comparison between shift to the basket-peg and to the managed floating, we can not derive explicit theoretical conditions. Instead, we reply on our quantitative analysis explained in next section.

Summarizing results in this subsection, concerning optimality between policy (2) and policy (3), the longer the transition period of adjustments, more benefits the monetary authority will gain from reaching the basket-peg regime at once. For a comparison between sudden shifts to the basket-peg regime (policy 3) and to the floating regime (policy 4), the welfare of the country is higher under shift to the basket-peg if fluctuations in exchange rate are large. Similarly, if we compare sudden shift to the managed floating (5) and to the free floating, the country will be better off shifting to managed floating, given large exchange rate fluctuations during the short periods.

6 Simulation exercise using Chinese and Thai data

In this section, we provide simulation results using Chinese and Thai data. Using estimated parameters for two countries, we quantify the cumulative losses for transitional policies. Our quantitative results support theoretical findings explained in Section 5.2 and 5.3: first, among the four policies, maintaining dollar-peg (policy 1) leads to highest losses in both Chinese and Thai cases. Second, contrasting two transition policies to the basket-peg regime, it is desirable for the country to adopt gradual adjustment rather than sudden shift in both countries. Lastly, comparing shifting to the basket-peg with shifting to the floating, for Thailand, it is better to shift to the basket-peg. For China, results depend on policy goals: for stabilizing output, shift to the basket-peg is desirable, while for stabilizing the price level, shift to the floating is optimal.

6.1 Data and estimation results

We use Chinese and Thai quarterly data from the IMF International Financial Statistics (IFS).\(^{32}\) Most variables except interest rates are defined in natural log. Concerning with exchange risks, we use variance of monthly exchange rate data as proxy. Applying Dicky-Fuller General Least Square (DF-GLS) unit root tests, we find some variables have unit roots. Then we move on Johansen co-integration tests, and prove that all variables in both Chinese and Thai samples are stationary.\(^{33}\)

\(^{32}\)Data as well as methods of calculation are available upon requests.

\(^{33}\)Results of unit-root tests and co-integration tests are shown in Appendix B.
We apply the Instrumental Variable (IV) method to estimate parameters simultaneously. We differentiate two sample periods based on regimes: for Chinese case (1) 1999Q1-2005Q2 for the dollar-peg, and (2) 2005Q3-2010Q4 for the floating. As China has never adopted *de facto* floating regime, we use estimated coefficients obtained for basket-peg regime (2). For Thai case, we set (1) 1993Q1-1997Q2 for the dollar-peg and basket-peg, (2) 1997Q3-2006Q1 for the floating A dummy variable is used to exclude impacts of the Asian currency crisis period 1997Q3-1998Q2 for Thai case. Table 4 shows estimation results. Values inside parentheses denote *t*-values of coefficients.

6.2 Simulation using estimated parameters

We quantify optimal values of instruments and values of cumulative losses according to the transition policies. For the exchange rates and exchange rate risks, we use the actual data for period 1999Q1-2010Q4 for China and period 1993Q1-2006Q1 for Thailand respectively. As we define exogenous shocks and other variables as deviations from the long-run values, we use deviation from the Hodrick–Prescott (H-P) filtered trend values. We assume time period for the dollar-peg as 1 quarter ($T_0 = 1$), interval for transition period as 18 quarters ($T_1 = 18$), and periods for target regime as 18 ($T_2 = 18$) quarters. Table 5 and 6 report values of cumulative losses and optimal instruments of four policies stabilizing output and the price level respectively.

From two tables above, we confirm theoretical findings discuss in Section 5. First, among the four policies, maintaining dollar-peg (policy (1)) leads to highest losses in both cases of stabilizing output and the price level for both China and Thailand. It implies that the country will be better off shifting to the target basket-peg regime or floating regime.

Second, contrasting two transition policies to the basket-peg regime, it is desirable for the country to adopt gradual adjustment rather than sudden shift in both cases of stabilizing output and the price level for these two countries. This is because interval of transition periods is not long enough for the country to gain benefits of shifting suddenly to the target regime. Moreover, the optimal weights of policy (2) and policy (3) are different as explained in Section 4.2 and 4.3.

Thirdly, comparing shifting to the basket-peg with shifting to the floating, for Thailand, the latter leads to higher losses showing that the country will be better off shifting to the desired basket-peg regime in both cases of stabilizing output and the price level. As mentioned in Section 5.3, this is the case where the country can receive benefits of committing to basket-peg through smoothing negative impacts of exchange rate fluctuations and deviation of exchange rate expectation. In the case of China, the results are mixed and depend on policy goals. If the authority prefers stabilizing output, it will be better off shifting to the desired basket-peg regime. On contrary, if the authority chooses to attain the price stability, its decision will be to shift to the floating regime. This is because, compared to output, there are less negative impacts associated with exchange rate fluctuations on domestic price level.

Finally, concerning with shifting to the managed floating, it is less attractive to adopt compared with shifting to the basket-peg. For Thailand, implementing shifts to the basket-peg is more desirable than to the managed floating, in both output and price level stability. It is also the case for China as well: shift to the managed floating results in higher losses than shift to the basket-peg. These results are due to the fact that intervening into foreign exchange rate market for certain periods leads to higher losses as the authority lacks monetary policy autonomy.
7 Conclusion

There is broad debate on desirable exchange regimes for East Asian countries. The dollar-peg which the most of East Asian country adopted before the Asian currency crisis, is blamed as one of the culprits of the crisis. Several economists advocate desirability of the basket-peg regimes in Asia. The main reason for adopting the basket-peg regime was that for countries with close economic relationships with the United States, Japan and the European Union, exchange rate stabilization vis-a-vis a basket comprising these currencies was beneficial, because it removed the problem of large fluctuations of exchange rates. Furthermore, Yoshino, Kaji, and Asonuma (2004) show that together with the basket-peg regime, the floating regime is also one of the options for East Asian countries.

The states which the previous research analyzes are those that an East Asian country reaches, once it has adopted the basket-peg or the floating. For countries like China and Malaysia, which currently adopts the de facto dollar-peg on the other hand, there is still a big question of how to get there.

This paper attempts to compute the dynamic effect of changing from the fixed exchange rate regime to the stable basket peg regime or the stable floating regime. We obtain two transition paths from the dollar-peg to the basket-peg regime (gradual adjustment of basket weight, or sudden shift) and one transition path from the dollar-peg to the floating regime.

The major findings are as follows. First, value of the cumulative losses of four policies are obtained theoretically as well as empirically. We find that maintaining the dollar-peg regime is desirable only in the short term, indicating that the country will be better off shifting to either the basket-peg regime or the floating regime in the long-run

Second, concerning a choice between gradual adjustment (policy 2) toward the target basket-peg regime or sudden shift to the target basket-peg regime (policy 3), the longer the transition period, the more benefits the country receives from reaching the desired regime at once.

Finally, for a comparison between sudden shifts to the basket-peg regime (policy 3) and to the floating regime (policy 4), the welfare of the country would be higher under the shift to the basket-peg regime if the exchange rate fluctuates significantly. The country would be able not only to stabilize negative impacts of exchange rate fluctuations on trades and capital inflows, but also let the private sector formulate exchange rate expectation precisely by committing to the basket regime for certain periods. Our numerical analysis using Chinese and Thai data support these findings.

However, our analysis is still limited to middle-term perspective compared with one based on longer time span such as 20 years or more. There is some possibility that the country might be better off adopting the floating regime in longer time horizons (more than 20 years or so). If so, a question concerning how the country shifts from the basket-peg regime to the floating regime remains as a future research topic.

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Moreover, for dollar-yen exchange rate which is exogenous and follows persistent process, we assume

\[ y_t - \bar{y}_t = \frac{(\delta + \theta)(1 - E_1)}{E_1} \left[ \psi \theta \epsilon_t^{$/yen} + (\psi \theta' + \mu') \epsilon_{t+1}^{$/yen,e} + (1 + \psi \rho) (\hat{p}_{t+1} - \hat{p}_t) + (\xi - \psi \varsigma) \Delta \hat{e}_{t}^{R/yen} - \psi \hat{p}_{it+1} \right] \]  

(A1)

Substituting equation (A1) into equation (3'), we obtain following equation such as

\[ y_t - \bar{y}_t = \frac{(\delta + \theta)(1 - E_1)}{E_1} \left[ \psi \theta \epsilon_t^{$/yen} + (\psi \theta' + \mu') \epsilon_{t+1}^{$/yen,e} + (1 + \psi \rho) (\hat{p}_{t+1} - \hat{p}_t) + (\xi - \psi \varsigma) \Delta \hat{e}_{t}^{R/yen} - \alpha_t - \psi \hat{p}_{it+1} \right] \]

(A2)

We take the expectation of both sides of equation (6) and (A2)\(^{34}\) and solve for \( \hat{p}_{t+1} \) and \( \hat{p}_t \):

\[ \hat{p}_{t+1} = a_1 \epsilon_t^{$/yen} + a_2 \epsilon_t^{$/yen,e}, \quad \hat{p}_t = a_3 \epsilon_t^{$/yen} \]  

(A3)

Moreover, for dollar-yen exchange rate which is exogenous and follows persistent process, we assume following expectation form:

\[ \epsilon_{t+1}^{$/yen,e} = a_4 \epsilon_t^{$/yen} \]  

(A4)

Substituting equation (A3) and (A4) into equation (A1) and (A2) respectively, we obtain

\[ y_t - \bar{y}_t = A_1(t) \epsilon_t^{$/yen} + A_2(t) \Delta \hat{e}_{t}^{R/yen} + A_3(t) \hat{p}_{it+1} \]  

(11)

\[ p_t - \bar{p}_t = A_1^p(t) \epsilon_t^{$/yen} + A_2^p(t) \Delta \hat{e}_{t}^{R/yen} + A_3^p(t) \hat{p}_{it+1} \]  

(11a)

\[ A_1(t) = -(\delta + \theta) A_1^p(t) + \theta + \theta' a_4 + \rho(a_1 + a_2 a_3 - a_3), \]

\[ A_2(t) = -(\delta + \theta) A_2^p(t) - \varsigma, \quad A_3(t) = -(\delta + \theta) A_3^p(t) - \rho, \]

\[ A_1^p(t) = -\frac{[\psi \theta + (\psi \theta' + \mu) a_4 + (1 + \psi \rho)(a_1 + a_2 a_3 - a_3)]}{E_1} (1 - E_1)^t, \quad A_2^p(t) = \frac{-(\xi - \psi \varsigma)}{E_1} (1 - E_1)^t, \quad \text{and} \quad A_3^p(t) = \frac{\psi \rho}{E_1} (1 - E_1)^t \]

A.2 Basket-peg regime with weak capital control (B)

Solving for equation (13), we obtain

\[ (p_t - \bar{p}_t) = -\frac{(1 - E_1)^t}{E_1} \left[ (\bar{G}_1 v + \bar{G}_1') \epsilon_t^{$/yen} + (\bar{G}_2 v + \bar{G}_2') \epsilon_{t+1}^{$/yen,e} + (1 + \psi \rho) (\hat{p}_{t+1} - \hat{p}_t) + (\xi - \psi \varsigma) \Delta \hat{e}_{t}^{R/yen} \right] \]  

(A5)

where \( \bar{G}_1 = \psi \left\{ \theta + \delta - \rho \sigma (1 - \lambda)^t \right\} + \eta + \mu, \quad \bar{G}_1' = \psi \left\{ -\delta + \rho \sigma (1 - \lambda)^t \right\} - \eta, \quad \bar{G}_2 = \psi \left\{ \theta' + \delta' + \rho (1 - \lambda)^t \right\} + \eta' + \mu' \quad \text{and} \quad \bar{G}_2' = \psi \left\{ -\delta' - \rho (1 - \lambda)^t \right\} - \eta' \]

\(^{34}\)We assume that exchange rate risk terms are mean zero, implying \( E(\Delta R/R) = 0 \) and \( E(\Delta R/yen) = 0 \).
Substituting equation (A5) into equation (3’), we obtain following equation such as

\[
(y_t - \bar{y}_B') = \frac{(\delta + \theta) (1 - E_1)^t}{E_1} \left[ \left( \bar{G}_1 v + \bar{G}_1' \right) \bar{e}_t^{$/yen$} + \left( \bar{G}_2 v + \bar{G}_2' \right) \bar{e}_{t+1}^{$/yen,e} + (1 + \psi \rho) (\bar{p}_{t+1}^e - \bar{p}_t^e) \right] \\
+ \{ -\delta(1 - v) + \theta v + \rho \sigma (1 - v)(1 - \lambda)^t \} \bar{e}_t^{$/yen$} + \rho (\bar{p}_{t+1}^e - \bar{p}_t^e) - \tau \Delta \bar{e}^{$/yen$} - \varsigma \Delta \bar{e}^{$/yen$}
\]

We take the expectation of both sides of equation (13) and (A5) and solve for \( \bar{p}_{t+1}^e \) and \( \bar{p}_t^e \),

\[
\bar{p}_{t+1}^e = (b_1 v + b_1') \bar{e}_t^{$/yen$} + b_2 \bar{p}_t^e, \quad \bar{p}_t^e = (b_3 v + b_3') \bar{e}_t^{$/yen$}
\]

Moreover, for dollar-yen exchange rate which is exogenous and follows persistent process, we assume following expectation form:

\[
\bar{e}_t^{$/yen,e} = b_4 \bar{e}_t^{$/yen}
\]

where \( b_4 = a_4 \). Substituting equation (A7) and (A8) into equation (A5) and (A6), we obtain

\[
(y_t - \bar{y}_B') = B_1(t) v \bar{e}_t^{$/yen$} + B_2(t) \bar{e}_t^{$/yen$} + B_3(t) \bar{e}_t
\]

where \( B_1(t) = -((\delta + \theta) B_1(t) + (\delta + \theta) + (\delta' + \theta') b_4 - \rho \sigma (1 - \lambda)^t + \rho (b_1 + b_2 b_3 - b_3),

B_2(t) = -((\delta + \theta) B_2(t) - \delta - \delta' b_4 + \rho \sigma (1 - \lambda)^t + \rho (b_1' + b_2 b_3 - b_3), B_3(t) \bar{e}_t = \left\{ \frac{(\delta + \theta)}{E_1} (\chi - \psi \tau) (1 - E_1)^t - \tau \right\} \Delta \bar{e}^{$/yen$} + \left\{ \frac{(\delta + \theta)}{E_1} (\xi - \psi \varsigma) (1 - E_1)^t - \varsigma \right\} \Delta \bar{e}^{$/yen$}

\]

A.3 Basket-peg regime with no capital control (C)

Solving equation (13) with (14’), we obtain following expression:

\[
(p_t - \bar{p}_C) = -\frac{(1 - E_1)^t}{E_1} \left[ \left( \bar{G}_3 v + \bar{G}_3' \right) \bar{e}_t^{$/yen$} + \left( \bar{G}_4 v + \bar{G}_4' \right) \bar{e}_{t+1}^{$/yen,e} + (1 + \psi \rho) (\bar{p}_{t+1}^e - \bar{p}_t^e) \right] \\
+ \{ -\delta(1 - v) + \theta v + \rho \sigma (1 - v)(1 - \lambda')^t \} \bar{e}_t^{$/yen$} + \rho (\bar{p}_{t+1}^e - \bar{p}_t^e) - \tau \Delta \bar{e}^{$/yen$} - \varsigma \Delta \bar{e}^{$/yen$}
\]

We take the expectation of both sides of equation (13) and (A9) and solve for \( \bar{p}_{t+1}^e \) and \( \bar{p}_t^e \),

\[
\bar{p}_{t+1}^e = (c_1 v + c_1') \bar{e}_t^{$/yen$} + c_2 \bar{p}_t^e, \quad \bar{p}_t^e = (c_3 v + c_3') \bar{e}_t^{$/yen$}
\]
Moreover, for dollar-yen exchange rate which is exogenous and follows persistent process, we assume following expectation form:

$$e_{t+1}^{$/yen,e} = c_4 e_t^{$/yen}$$  \hspace{1cm} (A12)

where $c_4 = a_4$. Substituting equation (A11) and (A12) into equation (A9) and (A10), we obtain

\begin{align*}
(y_t - y'_D) &= C_1(t) v e_t^{$/yen} + C_2(t) e_t^{$/yen} + C_3(t) \dot{z}_t \\
(p_t - p'_D) &= C_1^p(t) v e_t^{$/yen} + C_2^p(t) e_t^{$/yen} + C_3^p(t) \dot{z}_t \\
C_1(t) &= - (\delta + \theta) C_1'(t) + (\delta' + \theta' + \rho) c_4 + \rho(1 + \sigma) + \rho(c_1 + c_2 c_3 - c_3), \\
C_2(t) &= - (\delta + \theta) C_2'(t) - \delta + \rho(1 + \sigma) - (\delta + \rho) c_4 + \rho(c_1' + c_2 c_3' - c_3'), \\
C_3(t) &= \left\{ \frac{\delta(\delta+\theta) (1 - E_1)}{E_1} \right\} \Delta e^{R/yen} + \left\{ \frac{\delta(\delta+\theta) (1 - E_1)}{E_1} \right\} \Delta e^{R/yen}, \\
C_1^p(t) &= - \left\{ \frac{(1 - E_1^t)}{E_1} \right\} \left\{ \left( \Delta e^{R/yen} - (1 - \psi) \Delta e^{R/yen} \right) \right\}. \\
C_3^p(t) &= \left\{ \frac{(1 - E_1^t)}{E_1} \right\} \left\{ \left( \Delta e^{R/yen} - (1 - \psi) \Delta e^{R/yen} \right) \right\}. \\
\end{align*}

\section*{A.4 Floating regime without capital control (D)}

Solving equation (1') (3), and (5), we obtain the following equation:

\begin{equation}
\begin{aligned}
p'_{t+1} - p_t &= - E_3 p_t + E_4 m_t + E_5 e_t^{$/yen} + E_6 (p'_{t+1} - p'_t) + E_7 e_t^{R/yen} + E_8 e_t^{$/yen,e} + E_9 \Delta e^{R/yen} + E_{10} \Delta e^{R/yen} - \alpha t \\
\end{aligned}
\end{equation}

where

\begin{align*}
E_3 &= F_1 + F_2 \left\{ \epsilon - \phi(\delta + \theta) \right\}, \\
E_4 &= \frac{E_1}{E_1} \left( \epsilon - \phi(\delta + \theta) \right), \\
E_5 &= \frac{E_1}{E_1}, \\
E_6 &= \frac{E_1}{E_1}, \\
E_7 &= \frac{E_1}{E_1} \left( \epsilon - \phi(\delta + \theta) \right), \\
E_8 &= \frac{E_1}{E_1}, \\
E_9 &= \frac{E_1}{E_1}, \\
E_{10} &= \frac{E_1}{E_1}. \\
\end{align*}

Solving equation (26), we obtain following expression:

\begin{equation}
\begin{aligned}
(p_t - p'_D) &= - \left\{ \frac{(1 - E_3)}{E_3} \right\} \left\{ E_4 m_t + E_5 e_t^{$/yen} + E_6 (p'_{t+1} - p'_t) + E_7 e_t^{R/yen} + E_8 e_t^{$/yen,e} + E_9 \Delta e^{R/yen} + E_{10} \Delta e^{R/yen} \right\} \\
\end{aligned}
\end{equation}

We take the expectation of both sides of equation (26) and (A13) and solve for $p'_{t+1}$ and $p_t$:

\begin{equation}
\begin{aligned}
p'_{t+1} &= d_1 e_t^{$/yen} + d_2 p'_t, \\
p_t &= d_3 e_t^{$/yen}. \\
\end{aligned}
\end{equation}

Moreover, for dollar-yen exchange rate which is exogenous and follows persistent process, we assume following expectation form:

\begin{equation}
\begin{aligned}
e_{t+1}^{$/yen,e} &= d_4 e_t^{$/yen}, \\
e_{t+1}^{R/yen} &= d_5 e_t^{R/yen} = d_5 d_6 e_t^{$/yen} \\
\end{aligned}
\end{equation}

where $d_4 = a_4$. Substituting equation (A14) and (A15) into equation (3), we obtain

\begin{align*}
(y_t - y'_D) &= D_1(t) e_t^{$/yen} + D_2(t) \dot{z}_t + D_3(t) m_t \\
(p_t - p'_D) &= D_1^p(t) e_t^{$/yen} + D_2^p(t) \dot{z}_t + D_3^p(t) m_t \\
D_1(t) &= F_0 D_1^p(t) + F_7 \left\{ \frac{\phi}{F_8} + \frac{\phi(\phi(d_1 + d_2 d_3 - d_2))}{F_8} + \frac{\phi(\phi d_1)}{F_8} \right\}, \\
D_1^p(t) &= F_0 D_1(t) + F_7 \left\{ \frac{\phi(\phi d_1 + d_2 d_3 - d_2)}{F_8} + \frac{\phi(\phi d_1)}{F_8} \right\}. \\
\end{align*}

\begin{equation}
\begin{aligned}
D_1(t) &= F_0 D_1^p(t) + F_7 \left\{ \frac{\phi}{F_8} + \frac{\phi(\phi(d_1 + d_2 d_3 - d_2))}{F_8} + \frac{\phi(\phi d_1)}{F_8} \right\} + \frac{(\delta' + \theta') d_5}{\epsilon + \phi d_5}. \\
\end{aligned}
\end{equation}
\[ D_2(t) \hat{z}_t = F_6 D_2^p(t) \hat{z}_t - \left\{ \frac{F_7}{F_8} + \frac{\epsilon}{\epsilon + \rho} \right\} \{ \tau \Delta e^{R/\$} + \varsigma \Delta e^{R/yen} \} \]

\[ D_3(t) = F_6 D_3^p(t) - \frac{F_7}{F_8} + \frac{\rho}{\epsilon + \rho} \]

\[ D_4^p(t) = -\frac{1}{F_8} (1 - E_3) \frac{1}{E_3} \left[ E_5 \hat{e}_t^{\$/yen} + E_6 (d_1 + d_2d_3 - d_3) + E_8d_4 \right] \]

\[ \{ \frac{\epsilon(\delta + \theta) + (\delta' + \theta')d_3}{\epsilon + \rho} \} \frac{\epsilon - \phi(\delta + \theta)}{F_4} \]

\[ D_5^p(t) \hat{z}_t = -\frac{1}{F_8} (1 - E_3) \frac{E_9 \Delta e^{R/\$}}{E_3} + E_9 \Delta e^{R/yen} \] and \[ D_6^p(t) = -\frac{1}{F_8} (1 - E_3) \frac{E_4}{E_3} \]

\[ F_6 = -\frac{\epsilon(\delta + \theta) + \rho}{\epsilon + \rho} \]

**B Details of simulation exercise**

**B.1 Unit root and co-integration tests**

In this Appendix B, discusses results of unit root and co-integration tests. We start from applying Dicky-Fuller General Least Square (DF-GLS) unit root tests. Results of unit root test are presented in Table A1. Reflecting 10% significance critical value on DF-GLS statistics, some variables such as real interest rates and output gap have a unit root. Then we move on Johansen co-integration tests for equations shown in Table 6. Using 5% significance critical criteria, we find co-integration relationships among the variables in these equations.

[Insert Table B1 here]
[Insert Table B2 here]

**B.2 Initial impacts and total impacts of the shock**

With estimated parameters, we calculate the initial impacts and total impacts by one-unit by one-unit exogenous dollar-yen shock on endogenous variables under four regimes in Thai case, as presented in Table A3.

[Insert Table B3 here]

**B.3 Optimal weights and time span**

In Section 6.2, we derive optimal weights and values of cumulative losses given the fixed time span \((T_0 = 1, T_1 = 18, \text{ and } T_2 = 18)\). In this subsection, we focus on the relationship between the optimal weights under basket-peg and time span.

First, we consider the case of gradual adjustment to the basket-peg regime (policy (2)). using Thai data In general, optimal weight of basket is increasing respect to both the period for transition period and the period for stable regime.

[Insert Figure B1]

Next, we move on to the case sudden shift to the basket-peg regime (policy (3)) using Thai data as well. As before, as total time period gets longer, the optimal weight of basket is larger.

[Insert Figure B2]
C Case where foreign price levels are influenced by domestic price level

C.1 Theoretical values

We assume that the price level in both the US and Japan is highly influenced by price level in China reflecting both large share of imported goods from China in consumption basket and indirect impacts of low imported goods on other domestically produced goods:

\[ p^{US}_t = \bar{p}_1 p_t, \quad p^{JP}_t = \bar{p}_2 p_t \]  
(C1)

We obtain following equilibrium values for each regime respectively.

\[ y_t - \tilde{y}_A = A'_1(t)\tilde{e}_t^{$/yen} + A'_2(t)\Delta \tilde{e}_t^{R/\$} + A'_3(t)i_{t+1} \]  
(C2)

\[ p_t - \tilde{p}'_A = A'_p(t)\tilde{e}_t^{$/yen} + A'_2(t)\Delta \tilde{e}_t^{R/\$} + A'_3(t)i_{t+1} \]  
(C3)

\[ A'_1(t) = E_a A'_1(t) + \theta + \theta'a_4 + \rho(a_1 + a_2a_3 - a_3), \]
\[ A'_2(t) = E_a A'_2(t) - \varsigma, \quad A'_3(t) = E_a A'_3(t) - \rho, \]
\[ A'_p(t) = \frac{\psi(\theta + \psi \theta' + \mu)a_4 + (1 + \psi)\rho(a_1 + a_2a_3 - a_3)}{E_p} (1 - E_p) \]

\[ y_t - \tilde{y}'_B = B'_1(t)v\tilde{e}_t^{$/yen} + B'_2(t)\tilde{e}_t^{$/yen} + B'_3(t)\tilde{z}_t \]  
(C4)

\[ (p_t - \tilde{p}'_B) = B'_p(t)\tilde{e}_t^{$/yen} + B'_2(t)v\tilde{e}_t^{$/yen} + B'_3(t)\tilde{z}_t \]  
(C5)

where \( B'_1(t) = E_a B'_1(t) + \delta + \delta' + \rho(1 - \lambda) + \rho(b_1 + b_2b_3 - b_3), \)
\[ B'_2(t) = E_a B'_2(t) - \delta - \delta'b_4 + \rho(1 - \lambda) + \rho(b_1 + b_2b_3 - b_3), \]
\[ B'_3(t) = \frac{\psi(\theta + \psi \theta' + \mu)(1 + \psi)^2}{E_p} (1 - E_p) \}

and

\[ B''_3(t)\tilde{z}_t = \frac{(C_1 + b_4G'_2 + (1 + \psi)p)(b_1 + b_2b_3 - b_3)}{E_p} \]

\[ C_1(t) = E_a C'_1(t) + \delta + \delta' + \rho(1 + \sigma) + \rho(1 + \sigma) + \rho(c_1 + c_2c_3 - c_3), \]
\[ C_2(t) = E_a C'_2(t) - \delta - \delta'c_4 + \rho(1 + \sigma) - \delta - \delta(1 + \sigma) + \rho(c_1' + c_2c_3' - c_3'), \]
\[ C'_3(t)\tilde{z}_t = \frac{\psi(\theta + \psi \theta' + \mu)(1 + \psi)^2}{E_p} (1 - E_p) \]

and

\[ C''_3(t)\tilde{z}_t = \frac{(C_3 + b_4G'_3 + (1 + \psi)p)(c_1 + c_2c_3 - c_3)}{E_p} \]

\[ p_t - \tilde{p}'_D = D'_p(t)\tilde{e}_t^{$/yen} + D'_2(t)v\tilde{e}_t^{$/yen} + D'_3(t)v\tilde{e}_t^{$/yen} \]  
(C9)

\[ D'_1(t) = F_0 D'_1(t) + F_7 \left\{ \frac{\phi \theta d_1 + d_2d_3d_4 - d_3}{F_8} + \frac{\phi \theta d_3}{F_8} \right\} \frac{(\delta + \theta' + \mu)d_5}{\epsilon + \phi p} \]
\[ D'_2(t)\tilde{z}_t = F_0 D'_2(t)\tilde{z}_t - \left\{ F_0 F_8 + \frac{\epsilon}{\epsilon + \phi p} \right\} \frac{\tau \Delta \tilde{e}_t^{R/\$} + \varsigma \Delta \tilde{e}_t^{R/\$}}{E_p} \]
\[
D'_3(t) = F_6 \frac{D''_3(t)}{E_5} + \frac{\rho}{\epsilon + \phi p}, \\
D'_1(t) = -\frac{1}{E_5} (1 - E'_3) t \left[ E_5 \beta^g + E_6 (d_1 + d_2 d_3 - d_3) + E_8 d_4 \right], \\
D'_2(t) \beta_t = -\frac{1}{E_5} (1 - E'_3) t E_9 \Delta R^g + E_4 \Delta R^g \\
F'_6 = -\frac{\epsilon(\delta + \theta) + \rho}{\epsilon + \rho p} - \frac{\epsilon(\delta + \theta - \delta p_1 - \theta p_2) + (\delta' + \theta') d_2}{\epsilon + \rho p} \left( -\phi(\delta + \theta) \right)
\]

C.2 Simulation results

We follow the same procedure explained in Section 6. The estimated coefficients in equation C1 are shown in Table C1.

[Insert Table C1 here]

Table C2 summarizes values of cumulative losses for five transition policies stabilizing output and inflation rate. We find that main results discussed in Section 6.2 remain the same. First, among the five transition policies, maintaining the dollar-peg leads to highest losses in both cases of output and the price level stability. Second, contrasting two transition policies to the basket-peg regime, it is desirable to adopt gradual adjustment rather than sudden shift. Comparing shifts to the basket-peg or to the floating, results are again mixed: if the authority prefers to minimize output fluctuation, shift to the basket-peg is desirable. If the authority chooses to attain the price stability, then it will be better to shift to the floating regime. Finally, shift to managed floating results in higher loss values in both cases of output and price stability.

[Insert Table C2 here]

References


D Figure legends

Figure 1: The model

China (Home country)

\[ e^{R/S} \]

Imperfect Substitutes

\[ e^{S/yen} \]

Imperfect Substitutes

U.S. (Rest of the World) → Japan (Rest of the World)

Perfect Substitutes

Figure 2: Five policies toward stable regimes

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<th>(1)</th>
<th>Dollar-peg (A)</th>
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<th>Dollar-peg (A)</th>
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<td>( T_E )</td>
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Time
Figure A1: Optimal weight and time span under policy (2)

Figure A2: Optimal weight and time span under policy (3)
### E Tables

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<tr>
<th>Table 1: Table of notation:</th>
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<td>(2) Gradual shift to basket-peg</td>
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<td>(3) Sudden shift to basket-peg</td>
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<td>(4) Sudden shift to free floating</td>
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<td>(5) Sudden shift to managed floating</td>
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<td>Policy</td>
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<tr>
<td>(5) Sudden shift to managed floating during interventions</td>
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Note: *1 A proxy is based on the cumulative loss for time period of total 9 quarters (one initial period and two years).
*2 An estimate is based on the difference between values of the cumulative loss under transition period of 14 quarters and 18 quarters.
*3 An estimate of adjustment costs is based on difference between the cumulative losses based on the baseline $\lambda$ and based on 20% deviation from the baseline $\lambda$.
*4 A proxy of high volatility of $i$ is based on cumulative losses of change in interest rate originally caused by 0.001 unit deviation of $e^{$/yen} shock.
*5 An estimate of high volatility of $e^{R/$yen}, $e^{R/yen}$ is based on cumulative losses caused by 0.001 unit deviation of $e^{$/yen} shock.
*6 An estimate of high volatility of $e^{R/$yen}, $e^{R/yen}$, $e^{R/yen}$ is based on cumulative losses caused by 0.001 unit deviation of $e^{$/yen} shock.
*7 An estimate of not having monetary policy autonomy under interventions is based on values of cumulative loss under intervention periods.
### Table 4: Estimation Results using Chinese and Thai Data

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<th>Thailand</th>
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</tr>
<tr>
<td>ε</td>
<td>3.20*** (0.89)</td>
<td>10.13*** (1.89)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>δ, δ'</td>
<td>-1.20 (2.51)</td>
<td>1.27* (0.69)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>θ, θ'</td>
<td>0.70** (0.33)</td>
<td>-0.007 (0.42)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ρ</td>
<td>-0.52 (0.38)</td>
<td>0.63** (0.25)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>τ</td>
<td>-36.11 (46.78)</td>
<td>-0.14 (0.77)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>α</td>
<td>0.40 (1.50)</td>
<td>8.66 (15.91)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ψ</td>
<td>-0.04* (0.02)</td>
<td>0.13*** (0.04)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>η, η'</td>
<td>-0.06* (0.03)</td>
<td>-0.15** (0.07)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>μ, μ'</td>
<td>-1.32*** (0.26)</td>
<td>-0.35*** (0.11)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>δ</td>
<td>-7.28** (3.13)</td>
<td>-0.001 (0.14)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ξ</td>
<td>-5.87*** (0.88)</td>
<td>-7.80*** (2.80)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a_4, b_4</td>
<td>0.71*** (0.16)</td>
<td>0.49*** (0.19)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d_5</td>
<td>0.98*** (0.07)</td>
<td>0.71*** (0.14)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d_6</td>
<td>0.49*** (0.06)</td>
<td>-0.001 (0.14)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>β</td>
<td>0.99</td>
<td>0.99</td>
<td>0.99</td>
<td>0.99</td>
</tr>
</tbody>
</table>

Note: Note: ***, **, * denote rejecting the hypothesis at the 1%, 5%, and 10% significance levels.

*1 As China has never adopted de facto floating, we use estimated coefficients for the basket-peg period.
### Table 5: Values of cumulative loss for output stability

<table>
<thead>
<tr>
<th></th>
<th>Policy (1)</th>
<th>Policy (2)</th>
<th>Policy (3)</th>
<th>Policy (4)</th>
<th>Policy (5) (TE = 5)**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stable regime</td>
<td>Dollar-peg</td>
<td>Basket-peg</td>
<td>Basket-peg</td>
<td>Floating</td>
<td>Managed Floating</td>
</tr>
<tr>
<td>Adjustment</td>
<td>-</td>
<td>gradual</td>
<td>sudden</td>
<td>sudden</td>
<td>sudden</td>
</tr>
<tr>
<td>Instrument value</td>
<td>$i^* = 4.34$</td>
<td>$v^* = 0.58$</td>
<td>$v^{**} = 0.68$</td>
<td>$m^* = 0.016$</td>
<td>$m^{**} = 0.017$</td>
</tr>
<tr>
<td>Cumulative loss (value)</td>
<td>17.04</td>
<td>1.80</td>
<td>1.91</td>
<td>2.67</td>
<td>2.31</td>
</tr>
<tr>
<td>Cumulative loss (% of ($y^2$)*))</td>
<td>23.4</td>
<td>2.4</td>
<td>2.6</td>
<td>3.7</td>
<td>3.2</td>
</tr>
</tbody>
</table>

* We calculate the value of $y^2$ shown in section 3 and obtain $y^2 = 72.8$.
** If $TE = 7$, cumulative loss is 3.54 ($m^{**} = 0.017$).

### B. Thailand

<table>
<thead>
<tr>
<th></th>
<th>Policy (1)</th>
<th>Policy (2)</th>
<th>Policy (3)</th>
<th>Policy (4)</th>
<th>Policy (5) (TE = 3)**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stable regime</td>
<td>Dollar-peg</td>
<td>Basket-peg</td>
<td>Basket-peg</td>
<td>Floating</td>
<td>Managed Floating</td>
</tr>
<tr>
<td>Adjustment</td>
<td>-</td>
<td>gradual</td>
<td>sudden</td>
<td>sudden</td>
<td>sudden</td>
</tr>
<tr>
<td>Instrument value</td>
<td>$i^* = 3.0$</td>
<td>$v^* = 0.68$</td>
<td>$v^{**} = 0.62$</td>
<td>$m^* = 0.0082$</td>
<td>$m^{**} = 0.0082$</td>
</tr>
<tr>
<td>Cumulative loss (value)</td>
<td>0.0069</td>
<td>0.0006</td>
<td>0.0026</td>
<td>0.0052</td>
<td>0.0053</td>
</tr>
<tr>
<td>Cumulative loss (% of ($y^2$)*))</td>
<td>15.0</td>
<td>1.3</td>
<td>5.7</td>
<td>11.3</td>
<td>11.5</td>
</tr>
</tbody>
</table>

* We calculate the value of $y^2$ shown in section 3 and obtain $y^2 = 0.046$.
** If $TE = 5$, cumulative loss is 0.0057 ($m^{**} = 0.082$).

### Table 6: Values of cumulative loss for price stability

A. China

<table>
<thead>
<tr>
<th></th>
<th>Policy (1)</th>
<th>Policy (2)</th>
<th>Policy (3)</th>
<th>Policy (4)</th>
<th>Policy (5) (TE = 5)**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stable regime</td>
<td>Dollar-peg</td>
<td>Basket-peg</td>
<td>Basket-peg</td>
<td>Floating</td>
<td>Managed Floating</td>
</tr>
<tr>
<td>Adjustment</td>
<td>-</td>
<td>gradual</td>
<td>sudden</td>
<td>sudden</td>
<td>sudden</td>
</tr>
<tr>
<td>Instrument value</td>
<td>$i^* = 1.14$</td>
<td>$v^* = 0.65$</td>
<td>$v^{**} = 0.78$</td>
<td>$m^* = 0.11$</td>
<td>$m^{**} = 0.01$</td>
</tr>
<tr>
<td>Cumulative loss (value)</td>
<td>0.30</td>
<td>0.020</td>
<td>0.021</td>
<td>0.013</td>
<td>0.033</td>
</tr>
<tr>
<td>Cumulative loss (% of ($p^2$)*))</td>
<td>33.0</td>
<td>2.2</td>
<td>2.3</td>
<td>1.4</td>
<td>3.3</td>
</tr>
</tbody>
</table>

* We calculate the value of $p^2$ shown in section 3 and obtain $p^2 = 0.91$.
** If $TE = 7$, cumulative loss is 0.050 ($m^{**} = 0.015$).

### B. Thailand

<table>
<thead>
<tr>
<th></th>
<th>Policy (1)</th>
<th>Policy (2)</th>
<th>Policy (3)</th>
<th>Policy (4)</th>
<th>Policy (5) (TE = 3)**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stable regime</td>
<td>Dollar-peg</td>
<td>Basket-peg</td>
<td>Basket-peg</td>
<td>Floating</td>
<td>Managed Floating</td>
</tr>
<tr>
<td>Adjustment</td>
<td>-</td>
<td>gradual</td>
<td>sudden</td>
<td>sudden</td>
<td>sudden</td>
</tr>
<tr>
<td>Instrument value</td>
<td>$i^* = 5.0e^{-3}$</td>
<td>$v^* = 0.14$</td>
<td>$v^{**} = 0.59$</td>
<td>$m^* = 0.0011$</td>
<td>$m^{**} = 0.0019$</td>
</tr>
<tr>
<td>Cumulative loss (value)</td>
<td>0.0044</td>
<td>0.0022</td>
<td>0.0028</td>
<td>0.0038</td>
<td>0.0033</td>
</tr>
<tr>
<td>Cumulative loss (% of ($p^2$)*))</td>
<td>5.6</td>
<td>2.8</td>
<td>3.6</td>
<td>4.8</td>
<td>4.2</td>
</tr>
</tbody>
</table>

* We calculate the value of $p^2$ shown in section 3 and obtain $p^2 = 0.079$.
** If $TE = 5$, cumulative loss is 0.0033 ($m^{**} = 0.0024$).
<table>
<thead>
<tr>
<th>Variable</th>
<th>Degree</th>
<th>Trend</th>
<th>Lag</th>
<th>DF-GLS Stat.</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>$e_{R/$}$</td>
<td>level 0</td>
<td>0</td>
<td>0</td>
<td>-2.67***</td>
<td>I(0)</td>
</tr>
<tr>
<td>$e_{R/\text{yen}}$</td>
<td>level 0</td>
<td>0</td>
<td>0</td>
<td>-3.06***</td>
<td>I(0)</td>
</tr>
<tr>
<td>$i$</td>
<td>level 0</td>
<td>0</td>
<td>0</td>
<td>-1.65*</td>
<td>I(0)</td>
</tr>
<tr>
<td>$i - (p_{t+1}^e - p_t^e)$</td>
<td>level 0</td>
<td>0</td>
<td>8</td>
<td>0.17</td>
<td></td>
</tr>
<tr>
<td>$i^{US}$</td>
<td>level 0</td>
<td>0</td>
<td>7</td>
<td>-5.32***</td>
<td>I(1)</td>
</tr>
<tr>
<td>$m - p$</td>
<td>level 0</td>
<td>0</td>
<td>5</td>
<td>-1.88*</td>
<td>I(0)</td>
</tr>
<tr>
<td>$e_{R/$} + p^{US} - p$</td>
<td>level 0</td>
<td>0</td>
<td>0</td>
<td>-2.57**</td>
<td>I(0)</td>
</tr>
<tr>
<td>$e_{R/\text{yen}} + p^{yen} - p$</td>
<td>level 0</td>
<td>0</td>
<td>2</td>
<td>-3.22***</td>
<td>I(0)</td>
</tr>
<tr>
<td>$e_{$/\text{yen}}$</td>
<td>level 0</td>
<td>0</td>
<td>0</td>
<td>-2.80***</td>
<td>I(0)</td>
</tr>
<tr>
<td>$\Delta e_{R/$}$</td>
<td>level 0</td>
<td>0</td>
<td>0</td>
<td>-3.31***</td>
<td>I(0)</td>
</tr>
<tr>
<td>$\Delta e_{R/\text{yen}}$</td>
<td>level 0</td>
<td>0</td>
<td>0</td>
<td>0.17</td>
<td></td>
</tr>
<tr>
<td>$p_{t+1} - p_t$</td>
<td>level 0</td>
<td>0</td>
<td>8</td>
<td>-6.84***</td>
<td>I(1)</td>
</tr>
<tr>
<td>$y - \bar{y}$</td>
<td>level 0</td>
<td>0</td>
<td>4</td>
<td>-1.61*</td>
<td>I(0)</td>
</tr>
</tbody>
</table>

(2) Thailand

<table>
<thead>
<tr>
<th>Variable</th>
<th>Degree</th>
<th>Trend</th>
<th>Lag</th>
<th>DF-GLS Stat.</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>$e_{R/$}$</td>
<td>level 0</td>
<td>0</td>
<td>0</td>
<td>-2.90***</td>
<td>I(0)</td>
</tr>
<tr>
<td>$e_{R/\text{yen}}$</td>
<td>level 0</td>
<td>0</td>
<td>0</td>
<td>-3.27***</td>
<td>I(0)</td>
</tr>
<tr>
<td>$i$</td>
<td>level 0</td>
<td>0</td>
<td>0</td>
<td>-5.24***</td>
<td>I(0)</td>
</tr>
<tr>
<td>$i - (p_{t+1}^e - p_t^e)$</td>
<td>level 0</td>
<td>0</td>
<td>0</td>
<td>-1.07</td>
<td></td>
</tr>
<tr>
<td>$i^{US}$</td>
<td>level 0</td>
<td>0</td>
<td>0</td>
<td>-5.60</td>
<td>I(1)</td>
</tr>
<tr>
<td>$m - p$</td>
<td>level 0</td>
<td>0</td>
<td>2</td>
<td>-4.04***</td>
<td>I(1)</td>
</tr>
<tr>
<td>$e_{R/$} + p^{US} - p$</td>
<td>level 0</td>
<td>0</td>
<td>0</td>
<td>-3.03***</td>
<td>I(0)</td>
</tr>
<tr>
<td>$e_{R/\text{yen}} + p^{yen} - p$</td>
<td>level 0</td>
<td>0</td>
<td>0</td>
<td>-2.21***</td>
<td>I(0)</td>
</tr>
<tr>
<td>$e_{$/\text{yen}}$</td>
<td>level 0</td>
<td>0</td>
<td>0</td>
<td>-2.20**</td>
<td>I(0)</td>
</tr>
<tr>
<td>$\Delta e_{R/$}$</td>
<td>level 0</td>
<td>0</td>
<td>0</td>
<td>-3.81***</td>
<td>I(0)</td>
</tr>
<tr>
<td>$\Delta e_{R/\text{yen}}$</td>
<td>level 0</td>
<td>0</td>
<td>0</td>
<td>-5.81***</td>
<td>I(0)</td>
</tr>
<tr>
<td>$p_{t+1} - p_t$</td>
<td>level 0</td>
<td>0</td>
<td>3</td>
<td>-3.23***</td>
<td>I(0)</td>
</tr>
<tr>
<td>$y - \bar{y}$</td>
<td>level 0</td>
<td>0</td>
<td>2</td>
<td>-0.93</td>
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</tr>
</tbody>
</table>

Note: ***, **, * denote rejecting the hypothesis at the 1%, 5%, and 10% significance levels.
### Table B2: Johansen Co-Integration Test

#### (1) China

<table>
<thead>
<tr>
<th>Equation</th>
<th>Variables</th>
<th>Trend</th>
<th>Hypothesis</th>
<th>Trace Stati.</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aggregate</td>
<td>$y - \ddot{y}$</td>
<td>Deter.</td>
<td>None*</td>
<td>162.3 ***</td>
<td>0.00</td>
</tr>
<tr>
<td>demand</td>
<td>$e_R^/$ + $p^* - p$</td>
<td></td>
<td>at most 1*</td>
<td>118.9 ***</td>
<td>0.00</td>
</tr>
<tr>
<td></td>
<td>$e_R^{yen} + p_{yen} - p$</td>
<td></td>
<td>at most 2*</td>
<td>75.8 ***</td>
<td>0.00</td>
</tr>
<tr>
<td></td>
<td>$i - (p_{t+1}^e - p_t^e)$</td>
<td></td>
<td>at most 3*</td>
<td>36.9 ***</td>
<td>0.00</td>
</tr>
<tr>
<td></td>
<td>$\Delta e_R^/$</td>
<td></td>
<td>at most 5</td>
<td>14.0 *</td>
<td>0.08</td>
</tr>
<tr>
<td></td>
<td>$\Delta e_R^{yen}$</td>
<td></td>
<td>at most 6</td>
<td>2.7 *</td>
<td>0.09</td>
</tr>
<tr>
<td>Aggregate</td>
<td>$p_{t+1} - p_t$</td>
<td>Deter.</td>
<td>None*</td>
<td>171.3 ***</td>
<td>0.00</td>
</tr>
<tr>
<td>supply</td>
<td>$y - \ddot{y}$</td>
<td></td>
<td>at most 1*</td>
<td>121.8 ***</td>
<td>0.00</td>
</tr>
<tr>
<td></td>
<td>$e_R^/$ + $p^* - p$</td>
<td></td>
<td>at most 2*</td>
<td>78.8 ***</td>
<td>0.00</td>
</tr>
<tr>
<td></td>
<td>$e_R^{yen} + p_{yen} - p$</td>
<td></td>
<td>at most 3*</td>
<td>37.8 ***</td>
<td>0.00</td>
</tr>
<tr>
<td></td>
<td>$\Delta e_R^/$</td>
<td></td>
<td>at most 5</td>
<td>14.8 *</td>
<td>0.04</td>
</tr>
<tr>
<td></td>
<td>$\Delta e_R^{yen}$</td>
<td></td>
<td>at most 6</td>
<td>2.7 *</td>
<td>0.09</td>
</tr>
</tbody>
</table>

Note: ***, **, * denote rejecting the hypothesis at the 0.01, 0.05, and 0.1 significance levels.

*1 Trace test indicates 4 cointegrating equations at the 0.05 level.

*2 Trace test indicates 4 cointegrating equations at the 0.05 level.

#### (2) Thailand

<table>
<thead>
<tr>
<th>Equation</th>
<th>Variables</th>
<th>Trend</th>
<th>Hypothesis</th>
<th>Trace Stati.</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aggregate</td>
<td>$y - \ddot{y}$</td>
<td>Deter.</td>
<td>None*</td>
<td>139.0 ***</td>
<td>0.00</td>
</tr>
<tr>
<td>demand</td>
<td>$e_R^/$ + $p^* - p$</td>
<td></td>
<td>at most 1*</td>
<td>83.3 ***</td>
<td>0.00</td>
</tr>
<tr>
<td></td>
<td>$e_R^{yen} + p_{yen} - p$</td>
<td></td>
<td>at most 2*</td>
<td>47.6 *</td>
<td>0.05</td>
</tr>
<tr>
<td></td>
<td>$i - (p_{t+1}^e - p_t^e)$</td>
<td></td>
<td>at most 3*</td>
<td>23.7</td>
<td>0.21</td>
</tr>
<tr>
<td></td>
<td>$\Delta e_R^/$</td>
<td></td>
<td>at most 5</td>
<td>10.9</td>
<td>0.22</td>
</tr>
<tr>
<td></td>
<td>$\Delta e_R^{yen}$</td>
<td></td>
<td>at most 6</td>
<td>1.8</td>
<td>0.19</td>
</tr>
</tbody>
</table>

Note: ***, **, * denote rejecting the hypothesis at the 0.01, 0.05, and 0.1 significance levels.

*1 Trace test indicates 2 cointegrating equations at the 0.05 level.
Table B3: Impacts of 1% exogenous dollar-yen exchange rate shocks (denominated in term of %)

<table>
<thead>
<tr>
<th></th>
<th>((y_t - \bar{y}))</th>
<th>((p_t - \bar{p}))</th>
<th>((m_t - \bar{m}))</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A. Dollar-peg</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>initial impact</td>
<td>0.034</td>
<td>0.0005</td>
<td>0.076</td>
</tr>
<tr>
<td>total impact</td>
<td>1.3382</td>
<td>0.0496</td>
<td>0.0496</td>
</tr>
<tr>
<td><strong>B. Basket-peg (weak capital control)</strong></td>
<td>((y_t - \bar{y}))</td>
<td>((p_t - \bar{p}))</td>
<td>((i_t - \bar{i}))</td>
</tr>
<tr>
<td>initial impact</td>
<td>0.0486</td>
<td>0.029</td>
<td>0.1864</td>
</tr>
<tr>
<td>total impact</td>
<td>-0.7149</td>
<td>-3.0518</td>
<td>0.1864</td>
</tr>
<tr>
<td><strong>C. Basket-peg (no capital control)</strong></td>
<td>((y_t - \bar{y}))</td>
<td>((p_t - \bar{p}))</td>
<td>((i_t - \bar{i}))</td>
</tr>
<tr>
<td>initial impact</td>
<td>0.0502</td>
<td>0.0288</td>
<td>0.3937</td>
</tr>
<tr>
<td>total impact</td>
<td>0.7579</td>
<td>0.6877</td>
<td>0.3937</td>
</tr>
<tr>
<td><strong>D. Floating</strong></td>
<td>((y_t - \bar{y}))</td>
<td>((p_t - \bar{p}))</td>
<td>((i_t - \bar{i}))</td>
</tr>
<tr>
<td>initial impact</td>
<td>0.195</td>
<td>0.006</td>
<td>-1.456</td>
</tr>
<tr>
<td>total impact</td>
<td>1.508</td>
<td>2.107</td>
<td>-1.456</td>
</tr>
</tbody>
</table>

Table C1: Estimation Results using Chinese Data

<table>
<thead>
<tr>
<th>Coeffi.</th>
<th>China Fixed, Basket</th>
<th>Floating*</th>
<th>Sample</th>
<th>1999Q1-2005Q2</th>
<th>2005Q3-10Q4</th>
</tr>
</thead>
<tbody>
<tr>
<td>(\hat{p}_1)</td>
<td>0.09 (0.11)</td>
<td>0.54*** (0.18)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(\hat{p}_2)</td>
<td>-0.05 (0.08)</td>
<td>0.22** (0.09)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table C2: Values of cumulative loss for China

### A. Output stability

<table>
<thead>
<tr>
<th>Stable regime</th>
<th>Policy (1)</th>
<th>Policy (2)</th>
<th>Policy (3)</th>
<th>Policy (4)</th>
<th>Policy (5) ((T_E = 5))</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adjustment</td>
<td>Dollar-peg</td>
<td>Basket-peg</td>
<td>Basket-peg</td>
<td>Floating</td>
<td>Managed Floating</td>
</tr>
<tr>
<td>Cumulative loss (value)</td>
<td>11.56</td>
<td>1.20</td>
<td>1.28</td>
<td>2.82</td>
<td>2.66</td>
</tr>
<tr>
<td>Cumulative loss (% of ((\bar{y}^2)*)</td>
<td>13.3</td>
<td>0.01</td>
<td>0.02</td>
<td>0.03</td>
<td>0.03</td>
</tr>
</tbody>
</table>

* We calculate the value of \(\bar{y}^2\) shown in section 3 and obtain \(\bar{y}^2 = 86.8\).

### B. Price stability

<table>
<thead>
<tr>
<th>Stable regime</th>
<th>Policy (1)</th>
<th>Policy (2)</th>
<th>Policy (3)</th>
<th>Policy (4)</th>
<th>Policy (5) ((T_E = 5))</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adjustment</td>
<td>Dollar-peg</td>
<td>Basket-peg</td>
<td>Basket-peg</td>
<td>Floating</td>
<td>Managed Floating</td>
</tr>
<tr>
<td>Cumu. loss (value)</td>
<td>0.031</td>
<td>0.023</td>
<td>0.025</td>
<td>0.020</td>
<td>0.029</td>
</tr>
<tr>
<td>Cumu. loss (% of ((\bar{p}^2)*)</td>
<td>4.8</td>
<td>3.6</td>
<td>3.9</td>
<td>3.1</td>
<td>4.5</td>
</tr>
</tbody>
</table>

* We calculate the value of \(\bar{p}^2\) shown in section 3 and obtain \(\bar{p}^2 = 0.64\).