IS 'THE IMPOSSIBLE TRINITY' TRUE?

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ABSTRAK

Aliran modal masuk ke kawasan Asia-Pasifik meningkat secara signifikan pada akhir tahun 1980-an dan cenderung berlebih pada paruh pertama tahun 1990-an. Aliran modal masuk yang berlebih tidak akan berdampak buruk apabila 'The Impossible Trinity' benar terjadi. Tulisan ini bertujuan menelaah fenomena 'The Impossible Trinity (Kemustahilan Tritunggal)' yaitu independensi kebijakan moneter, eksogenitas kurs, dan aliran modal internasional yang bebas. Kawasan Asia-Pasifik tidak dapat menghindari terjadinya 'Kemustahilan Tritunggal'. Salah satu komponen Tritunggal harus diendogenkan. Di samping itu, sterilisasi juga terbukti tidak efektif dalam mengantisipasi aliran modal masuk.

INTRODUCTION

Capital flows to the Asia-Pacific region increased significantly in the late 1980s and the first half of the 1990s. The folowing table shows the capital flows as percentages of GDP in some selected Asian-Pacific countries.

Tabel 1. Capital Flows in Selected Asian-Pacific Countries (% of GDP)

	1985	1989	1990	1992	1993	1994
Indonesia	1.60	3.09	4.08	4.66	3.65	2.19
Korea	1.81	-1.19	1.13	2.26	0.96	2.79
Malaysia	5.66	3.53	4.16	15.08	17.06	2.14
Philippines	-1.98	3.43	3.87	6.16	5.82	7.40
Singapore	3.95	1.51	12.55	-2.68	9.64	2.59
Thailand	4.21	8.63	10.30	8.78	8.98	9.88
China	3.16	0.91	0.78	-0.06	4.49	6.79

Source : Leung (1996), Appendix, Table Ai, P.22-23.

Increased inflow of private capital is a sign of good health for developing economie However, surges in capital flows pose problems for macroeconomic management. For countries that adopt fixed exchange rate regimes, surges in capital inflows add directly to the money base and money supply, making control of inflation

difficult in an environment of deregulated financial sector, if the impossible trinity (exogeneous exchange rates, monetary independence, and free flows of international capital) were true, surge; in capital inflows may not cause problems for macroeconomic management {Leung, 1996, p.1-2). This paper will discuss whether coun tries in Asia-Pacific can escape from the impossible trinity. The effectiveness of mone tary policy depends on the degree of financial sector development and the exchange rate regime. The first two sections of this paper will discuss the exchange rate regimes and the financial deregulation in the region. Escape from the impossible trinity hinges crucially on the countries' ability to sterilize the effects of the inflows. The final section of this paper presents the sterilization of capital inflows in the region.

THE EXCHANGE RATE REGIMES IN ASIA-PACTFIC

There exists different historical versions of exchange rate regimes, but countries can generally be classified in terms of combinations of the basic types: a freely flexible exchange rates, a fixed (pegged) exchange rates, and a managed (controlled) exchange rate regime. A freely flexible exchange rate regime exists whenever exchange rates are freely determined by the demand for and supply of currencies by private parties. A fixed exchange rate regime exists whenever the government intervenes in the foreign exchange markets through its central bank in an effort to maintain the exchange rate within narrowly prescribed limits. A managed exchange rate regime exists when government intervenes in the foreign exchange market in order to influence the exchange rate but does not commit itself to maintaining a certain fixed excange rate or some narrow limits around it (Rivera-Batiz and Rivera-Batiz, 1994, p.50-51). Many developing countries have altered their exchange rate regimes from pegging to a single currency toward either pegging to a basket of currencies or adopting a more flexible arrangement under which the domestic currency is frequently adjusted. A number of the pegs being crawling variety (Aghevli, Khan, and Montiel, 1991, p.2; Leung, 1994, p.l).

Prior to the Asian currencies crisis started in July 1997, all countries of Indonesia, Malaysia, Philippines, Singapore, Thailand, Korea, and China have some form of managed regime. The domestic currencies of the Asia-Pacific countries are on a 'crawling' peg with a basket of currencies (Leung, 1996, p.3).

There is a relationship between the exchange rate regime and financial discipline. A flexible exchange rate does not free the authorities from the external constraint on their domestic policies, in the presence of capital mobility, domestic policies greatly influence movements in the exchange rate and the current account balance, and in turn, constrain domestic policies. The adoption of a fixed exchange rate regime imposes a degree of financial discipline that would be absent under a flexible regime. A fixed exchange rate would be viable only if the public sector is perceived to be financially solvent over the longer term. To the extent that the solvency condition is not satisfied, the government would have to rely on the inflation tax. The consequent acceleration of domestic inflation and the decline in international reserves would lead to recurrent devaluations. A pegged arrangement does not necessarily impose financial discipline so long as the government retains the option of periodically devaluing the currency (Aghevli, Khan, and Montiel, 1991, p.20-21).

FINANCIAL DEVELOPMENT IN ASIA-PACIFIC

In mid 1980s developing countries in Asia Pacific tend to phase out the direct instruments they used to operate monetary policy (credit controls, interest rate ceilings, and directed credits) and began moving toward full reliance on indirect instruments, such as open market operations, rediscount facilities, and reserve requirements. Indirect monetary instruments are utilized to enhance the role of price signals in the economy. In a more open economic environment, direct instruments have become increasingly ineffective, leading to inefficiencies and disintermediation (Alexander, et al, 1995, p.l).

1. Why Do Countries Liberalize Their Financial Sector?

World Bank Development Report (1989) provides an excellent synthesis about the relationship between financial systems and economic development. Studies suggest that rigid ceilings on interest rates have hindered the growth of financial saving, and reduced the efficiency of investment. In most countries this overall rigidity has been compounded by a pattern of interest rates that failed to discriminate between borrowers on the basis of ioan maturity, risk, or administration cost (World Bank Development Report, 1989, p.128-9).

Furthermore, liberalization should not be limited to the reform of the banking system but should seek to develop a more broadly based financial system that will include money, capital markets, and non-bank intermediaries. A balanced and competitive system of finance contributes to macroeconomic stability by making the system more robust in the face of external and internal shocks. Active security markets increase the supply of equity capital and longer term credit, which are vital to industrial investment (World Bank Development Report, 1989, p.130).

2. Shallow (Repressed) versus Deep (Liberalized) Finance

Policies for financial deepening (financial liberalization) seek to promote growth in the real size of the financial system: the growth of financial assets at a pace faster than income growth. In all but the highest-income developing countries, private sector financial savings predominantly take the form of currency and deposits in commercial banks, savings and loan associations, postal savings accounts, and mortgage banks. Therefore, for most developing countries, growth in the real size of the financial system is primarily reflected in the growth of liquid assets share in GDP. Under shallow (repressed) finance, the ratio of liquid assets to GDP grows slowly or not at all over time and typically will fall, hence, the real size of the financial system shrinks. Countries which are able to mobilize large volumes of government savings or foreign savings can sustain high growth rates even if they adopt shallow finance policies. Yet, for countries where mobilization of savings is difficult, deep finance may be essential for sustained growth since the growth of the share of liquid assets in GDP provides an indication of the banking system's ability to increa e its lending for investment purposes (Gilli etal 1996,p.376).

When governments tax and otherwise distort their domestic capital market, the economy is said to be financially repressed. Ceilings on interest rates, high reserve requirements, and compulsory credit allocations are the characteristics of repressed finance. These characterisics, interact with ongoing price inflation, reduce the attractiveness of holding claims on the domestic banking system. In such a repressed financial system, real deposit rates of interest on monetary assets are often negative. Negative real interest rates tend to lower the marginal efficiency of investment. Sharply negative interest rates lead to a shrinkage in the system since the demand for liquidity assets contracts. Contraction in the financial system results in a reduction in the real supply of credit and thus constricts investment in productive assets. Under such circumstances, nonprice rationing of resources must occur and can take many forms. Credit subsidies are utilized to promote the goals of the development plan in developing countries. The minister of finance is usually hard-pressed to raise revenue m order to provide grants to subsidize production activities. Tariffs and other restrictions on foreign trade are usually adopted to protect certain industries. Furthermore, the central bank is often under the direct control of the minister of finance or other important economics ministers in the cabinet. Therefore, selective credit subsidies to favoured borrowers on an industry-by-industry basis or firm-by-firm basis are easy to administer. Repressed financial strategies cause higher capital-output ratios. Therefore, growth in national income and growth in savings tend to be lower than in the case where real rates of interest are positive. Repressed finance retards income and employment growth (McKinnon, 1982, p. 43-44; Meier, 1995, p.43-44; Gillis, et al, 1996, p.377-380).

Financial repression as an impediment to economic development is a central paradigm. If growth takes investment, then three conditions must be met: firms or government must be willing to invest, savings must be available, and these savings must be channeled to those who plan to invest and face the most attractive investment opportunities (Dornbusch and Reynoso, 1989, p.204). Shaw and Meier (Meier, 1995, p.205) suggested to remedy financial repression by keeping positive and more uniformly high real rates of interest within comparable categories of bank deposits and loans by eliminating undue reserve requirements, interest ceilings, and mandated

credit allocations on the one hand, while stabilizing the price level through appropriate Tuacroeconomic measures on the other. Liberalized finance as a strategy has several objectives: 1) mobilizing a larger volume of savings from the domestic economy, 2) enhancing the accessibility of savings for a!l types of domestic investors, 3) securing a more efficient allocation of investment throughout me economy, 4) permitting the financial process to mobilize and allocate savings to reduce reliance on the fiscal process, foreign aid, and inflation. One of the main advantages of liberalization is that prices are allowed to income signals for allocation of resources in the economy. Deep finance will involve a move toward positive real interest rates by allowing higher nominal rates on deposits and loans, curbing the rate of inflation, or some combinations of both. As the real rate of interests move toward positive levels, savers strongly tend to increase their holdings of liquid assets, which in turn, will lead to a real expansion in the suppiy of credit to investors. Under deep finance, inflation tends to be moderate, therefore, savers are not subject to persistently high inflation taxes on liquid asset holdings. As a result, financial resources will flow to the financial system which is more accessible to prospective investors. Nonprice rationing of credit will diminish as well. The capacity of the financial system to identify and support investment opportunities expands, and as a result, growth prospects are accordingly enhanced (Gillis, et. al, 1996, p.380-382; Meier, 1995, p.205; Leung, 1991,p.139).

Empirical studies seem to support the theoretical propositions for the financial liberalization. Dombusch and Reynoso (1989, p.2O4-206) found that positive real deposit rates raise the saving rate. There is a strong belief that the abiiity of higher interest rates will mobilize saving. Major stabilization programs appear to affect the saving rate Stabilization is associated with fiscal reform that directly raises the national saving rate. Following stabilization, a sharp reduction in durable purchases leads to a dramatic increase in saving. Dombusch and Reynoso also found a positive correlation between finanual deepening and growth, although the correlation is not tight. Furthermore, they found that increased Teal rates raise investment. Higher real deposit interest rates raise savings and hence the equilibrium rate of investment. In addition, McKinnon provides additional explanation: since investment projects are

lumpy, investors must accumulate their investment balances in the form of deposits until the required principal is reached. Higher return on deposits increases investors' motivation to engage in the accumulation process. Dornbusch and Reynoso also found that increased real deposit rates promote growth. There are two channels that can be considered. The first deals with the external resources. The removal of ceilings allows the domestic financia! system to draw in resources that would not otherwise be available. The second link to growth comes through the quality of investment. It is commonly argued that a repressed financial system allocates saving inefficiently. Rationing leads to unqualified investment financing. In contrast, higher reai interest rate, which characterizes deep finance, raises domestic saving and hence increases the available supply of resources for investment.

3. From Shallow Finance to Deep Finance: The Growing Interdependence of Financial Markets in Asia Pacific

The first step involved in a shift from shallow to deep financial strategies is raising ceilings on nominal rates for both deposits and loans. In some cases, it requires nominal interest rates as high as 30 percent on time deposits (Korea in 1966 and Indonesia in 1968 and 1974) or as high as 50 percent (in Argentina and Uruguay in 1976). Marked increases in flows of savings to financial institutions have been observed when nominal rates were increased substantially, as in Uruguay in 1976, Indonesia in 1968 and 1983, and Taiwan and South Korea in 1965. There is now widespread agreement (hat flows of saving and investment should be voluntary and significantly decentralized in an open capital market at close to equilibrium interest rates. Countries that have sustained higher real rates of interest have generally had robust real financial growth leading to higher real economic growth. The rapid growth economies in Asia Pacific -Japan, South Korea, Taiwan and Singapore- have high and rising ratio of broad money to GNP which indicates a large real flow of loanable funds. This ratio is about 0.75 or more in Singapore, Taiwan, and Japan by 1980 (Gillis, et. al, 1996., p.380, Meier, 1996, p.205-206).

Deep finance strategies combined with technological advances that have greatly reduced transaction and information costs have led to the growing

interdependence of world financial markets. Financial flows to Pacific Basin countries have grown faster than either output or foreign trade during the last two decades. The group of Four Asian Newly Industrializing Economies (NIEs) - Hongkong, South Korea, Taiwan, and Singapore-became significant net capital exporters in the second half of the 1980s, primarily as a result of a sharp rise in domestic savings rates. These four NIEs' share in total world gross savings increased fivefold in less than two decades. However, the increased integration of financial markets has not been associated with a marked increase in the transfer of savings to Asian developing countries as a group. This suggests that for Asian developing countries as a group, increasing globalization of financial markets has not made a large direct contribution -in the form of higher inflows of foreign savings- to increased domestic capital formation. The most significant impact on economic growth is likely to stem from an increased efficiency of investment. Meanwhile, the importance of external borrowing has declined substantially since 1983, while inflows of foreign direct investment have become relatively more significant as a source of foreign savings (Goidsbrough andTeja, 199I,p.3-4).

Financial deregulation results in the development of forward exchange markets because of the direct relationship between domestic interest rates and the spot and forward rates. This relationship results from the activities of international traders and investors who wish to hedge their foreign transactions, international interest arbitragers, and currency speculators who expect to make profits from currency fluctuations. Korea, Indonesia, and Thailand embarked on financial deregulation from the mid-1980s, and foreign exchange turnovers expanded rapidly. In the Philippines, with its combination of macro-economic instability and low growth, the process of financial liberalization itself is threatened. Australia and New Zealand liberalized their financial sectors early in the 1980s and their foreign exchange markets grew rapidly. In a financially deregulated environment, financial intermediaries would be able to set market-clearing forward rates once the domestic interest rates and spot exchange rates were determined in the market. Exchange risks are borne by currency speculators. If domestic interest rates and or spot rates were highly regulated, then exchange risks are borne by the central bank either directly

through providing cover for international traders and debtors or indirectly by providing cover for commercial banks. Financial environment is crucial to the development of markets for financial hedging. In a relatively deregulated environment, where interest rates and spot rates are market determined, forward exchange markets and other derivative markets will grow to meet the needs of firms to manage risks associated with international trade and investment. Continued financial liberalization in the region should enable financial hedging to be a more accessible and cost-effective tool for managing short-term exchange rate fluctuations (Leung, 1996, p.8-12).

DO ASIAN-PACIFIC COUNTRIES ESCAPE FROM THE IMPOSSIBLE TRINITY?

This section will discuss whether the impossible trinity is no exception for the Asia-Pacific region. Firstly, it will present the ineffectiveness of monetary policy under fixed exchange rates and perfect capital mobility. Secondly, it will discuss the implications of capital inflows on the monetary policy. And lastly, it will comment on the use of sterilization in the region.

Monetary policy is a major component of economic policy in market economies. In an economy under fixed exchange rates and perfect capital mobility, monetary policy is completely ineffective in influencing the economy's equilibrium. Suppose, for example, there is a once-and-for-all increase in the central bank's holdings of bonds. This would increase the money supply, reduce domestic interest rates, and spur investment and output. The LM curve will shift rightward, with increased output and lower domestic interest rate. Capital outflow will occur, moving the capital account and the balance of payments into deficit. As domestic income increases, imports increase and the trade balance deteriorates. As a result, the balance of payments will be worsened. It implies an excess private demand for foreign exchange as investors try to acquire foreign exchange to buy the more profitable foreign financial assets. The central bank satisfies this excess private demand for foreign exchange by selling some of its holdings of foreign exchange reserves. The money suppfy then will decrease in response to the loss in international reserves. The LM curve wiM shift back toward the initial level. The capital outflow will continue as

long as the domestic interest rate tends to be below the world level. The adjustment process of the economy, which occurs instantenously under perfect capital mobility, stops only when there are no pressures on domestic interest rates to decrease below the world interest rate. At that point, the deficit is eliminated. The domestic money supply thus returns to the initial level.

Central bank credit creation can change the composition of the asset structure of the central bank portfolio by increasing its holdings of bonds and decreasing foreign exchange reserves. The overall change in the monetary base, dH, is, however, equal to zero. Changes in the monetary base can be broken down into changes in central bank credit and changes in international reserves:

$$dH = dCBC + dIR = 0$$

An increase in central bank credit, (dCBC greater than zero), would lead to offsetting capital flows, reducing international reserves (dIR less than zero), by the same amount as the initial increase in central bank credit (dCBC = ■ dIR). Under a regime of fixed exchange rates with perfect capilal mobility, domestic monetary authorities would not be able to affect the domestic interest rate, which has to align with the interest rate given by world capital market. The increase in central bank credit generates an excess supply of money -at the given world interest rate- that tends to push down the domestic interest rate. This downward pressure on the domestic interest rate induces capital outflows, reducing the domestic money supply and eliminating the excess supply of money created initially. In the case of perfect capital mobility, monetary policy is not able to influence the domestic money supply, even in the short run. Ineffective monetary policy can occur regardless the degree of capital mobility. Monetary authorities might face difficulty in controlling money supply especially over the long run. With imperfect capital mobility, sterilization is a feasible policy in the short run, although over the longer run, the central bank runs me risk of running out of foreign exchange reserves {Alexander, et al, 1995, p.7; Rivera-Bati?. and Rivera-Batiz, 1994, p.395-396, p.409-410).

International capital mobility places stringent boundaries on how much domestic interest rates can diverge from the world interest rates. It also makes very difficult the task of controlling the money supply under fixed exchange rates. An expansionary monetary policy increases the central bank credit component of the monetary base but lowers the domestic interest rates and induces capita! outflows. Capital outflows can thus offset the effects of an open market operation on the money supply. If the central bank credit expansion is fully offset, the only net effect of the operation is then to aiterthe central bank's portfolio composition and domestic residents' portfolios. A critical question concerns how fast the offset can be completed. What do the data say regarding the offsetting capital flows? The following paragraph will present the offsetting capital flows in Asia-Pacific.

The coexistence of exchange rate stability, free movement of international capital, and monetary autonomy has been called the 'impossible trinity'. If exchange rates were allowed to float, capital inflows would not affect money suppEy and inflation, but nominal exchange rate appreciation could still impact negatively on export-led growth. If fixed exchange rates were maintained and the country reverted to credit rationing to curb inflation, microeconomic distortions would be created (Leung, 1996, p.2).

Kouri and Porter (1974) developed a model of international capital flows from a general equilibrium model of the financial markets of an open economy. Capital flows are viewed as the mechanism by which a domestic excess demand for money is removed and consequently the key explanatory variables in the model are changes ia domestic income, the current account balance, changes in domestic monetary instruments, and changes in foreign interest rates. All of the explanatory variables will affect either the demand for or supply of money. The inflow of capital funds may be fully explained by changes in the distribution of domestic wealth between alternative assets and the demand for domestic financial assets from overseas (Kouri and Porter, 1974, p.443; Murray, 1978, p.271-272).

The financial sector model assumes three assets: domestic money, financial assets denominated in domestic currrency (domestic bonds), and financial assets denominated in foreign currencies (foreign bonds). Equilibrium in the money and bond markets simultaneously determines the domestic interest rate and exchange rate.

If exchange rates were pegged or determined exogeneously, then the level of international reserves become endoge-neously determined. Using the data of Asian-Pacific countries (Indonesia, Korea, Malaysia, Philippines, Taiwan, and Thailand), Fry (1995) and Leung (1996) estimated the impact of the change in domestic assets, current account balance, change in real gross domestic product, domestic inflation, change in world interest rates, and expected depreciation in exchange rate on capital flows.

The coefficient on the net domestic assets is called the 'offset' coefficient. It measures the degree to which a monetary policy change becomes offset by international capital flows. Fry (1995) found that during 1960-1991, the offset coefficients were relatively small, implying that the countries were able to maintain relatively independent monetary policies since direct controls over domestic interest rates and bank lending enabled monetary authorities to exercise monetary policy independently of changes in international reserves. However, Leung (1996) argued that Fry's data are heavily weighted towards the sample period prior to financial deregulation. Leung estimated the data from 1984-4 to 1995 and found out that there is an increased offset to monetary policy in the region. Countries are facing an increasingly difficult trade-off between maintaining pegged exchange rates and pursuing independent monetary policies.

Capital inflows to Asia Pacific have grown faster than either output or foreign trade during the last two decades. The upsurge in gross flows represents a massive expansion in the international trading of risk and maturity transformation (Goldsbrough and Teja, 1991). This is widely regarded as a very welcome phenomenon, raising levels of investment and encouraging economic growth. However, surging capital inflows can result in destabilizing side effects, including a tendency for the local currency to gain in value, undermining the competitiveness of export industries, and potentially giving rise to inflation. Capital inflows result in a buildup of foreign exchange reserves. As these reserves are used to buy domestic currency, the domestic monetary base expands without a corresponding increase in production, and as a result, too much money begins to chase too few goods and services. To ease the threat of currency appreciation or inflation, central banks often attempt what is known as the sterilization of capital flows. Sterilization is one

kind of government intervention which aims to restrict the growth of domestic money caused by capital inflows. Sterilization of capital inflows via the banking channel includes the use of indirect instruments such as the open market operation and the change in reserve requirements. It also includes the more direct instruments such as shifting government deposits from commercial banks to the central bank and direct lending controls over commercial banks. Indonesia. Korea, Malaysia, Philippines, Singapore, and Thailand used all the above instruments to sterilize their capital inflow surges in the past decade. Sterilization could also be conducted through nonbanking channel such as inter vening in forward exchange market, ea ing restrictions on capital outflow, and widening exchange rate bands. The following paragraphs will present several measures of sterilization (Leung, 1996, p.6-15, Lee, 1997, p.l-I6):

a). Open Market Operation

Under a regime of fixed exchange rates, the centra! bank's actions in the foreign exchange market are linked fo the country's balance of payments surplus or deficit. In the case of a deficit, the central bank has to sell its foreign exchange reserves to the public. As a result, the monetary base tends to decline. In this situation, if the central bank wants to sterilize the effects of the deficit on the monetary base, it has to increase domestic credit creation by exactly the same amount. A typical sterilization operation in this case would then be a purchase of bonds by the central bank in the open market. The purchase would have to be of an amount equal to the loss of international reserves induced by the balance of payments deficit. However, under perfect capital mobility, sterilization may not be able to fulfill its mission. Suppose, an economy is in balance of payment deficit. The deficit implies a loss in the central bank's holdings of international reserves. If the central bank does not sterilize, this reduction in reserves would tend to reduce the domestic money supply until the excess money supply is eliminated and the downward pressure on domestic interest rates ends. Suppose, however, the central bank sterilizes by buying an amount of bonds in the open market equal to the loss of international reserves. In this case, the downward pressures on domestic interest rates would be sustained because the domestic money supply is not allowed to adjust in response to the payments deficit. Massive capita! outflows would continue to occur. As long as the

central bank remains committed to maintaining a fixed exchange rate, it would not be able to support its sterilization operations to any significant extent. International reserves would be quickly depleted and a devaluation would become necessary. Sterilization policies and fixed exchange rates are inconsistent (Rivera-Batiz and Rivera-Batiz, 1994, p.391-409). Moreover, the scope for classical open market operation may be severely restricted by the available instruments, which are unlikely to have well developed financial markets, particularly in developing countries. In particular go\ era ment bonds may be an imperfect substitute for the financial assets foreign investors actually want to hold, such as stocks. Even if sterilization pushes up interest rates, which may in itself encourage more inflows, the prices of preferred assets, which are in limited supply, may still continue to rise, acceleratip the inward flow. Sterilization is often limited by an inadequate supply of marketable in mi ments or by segmented local market condi tions. Furthermore, heavy fiscal cost may eventually derail the sterilization effort. Sterilization through the sale on the open market of government bonds carries a quasi fiscal cost. This cost is measured by the difference between the yield by holding the bonds versus holding international re er\e Such costs are estimated to be 0.8 percent of GDP for Chile in 1991. The sale of government bonds increases the interest rates on these assets and it represents the increased burden on the government's debt service. In turn, it can lead to a deterioration in the fiscal balance. Tt
tends also to exacerbate the surge in inflows by keeping domestic interest rates higher than without sterilization. Therefore, reliance on bank sterilization tends to slacken, particularly in Korea, Philippines, and Thailand.

b). Change in Reserve Requirement

Increasing statutory reserve requirements-the proportion of assets that commercial banks must hold on deposit with the central bank- is another method of limiting the expansion of credit. The effect of increasing requirements to sterilize capital flows is substantially the same as with open market operations. When interest is paid at or close to market-determined rates, the cost is likely to be much the same as with open market sales of interest-bearing instruments. Reserve requirements have

several practical limitations. Some banks may have already hold reserve assets in excess of statutory requirements. For weak banks which are numerous in developing countries, higher requirements are difficult or dangerous to implement. Frequent changes can be disruptive to the efficient management of bank portfolios. Furthermore, in economies that are trying to liberalize their financial markets, changing reserve requirements is often seen as sending the wrong signal. They are in effect a tax on banks and may cause financial disinterme-diation with financial activities moving outside the banking system, hence, weakening the central bank's monetary control. In Korea, sterilization through increases in reserve requirement was much less effective.

c). Management of Public Sector Deposit

Another way to absorb reserves is to shift public sector deposits from commercial banks to the central bank. If the public sector deposits account for a large slice of the banking system deposit base, as in Malaysia and Thailand, this method has been highly effective. Unless the interest paid on government depo-its is higher at the central bank than at the commercial banks, there is no fiscal cost. However, if the transfers to and from are frequent and unpredictable, uncertainty is much greater for commercial banks, hence, it is harder for them to manage portfolio efficiently. This method is also limited by the availability of government deposits.

d). Foreign Exchange Swaps

Another method to sterilize capital inflow is to do a foreign exchange swap in which the central bank agrees to sell foreign exchange against the domestic currency and simulta neously agrees to buy it back at a specified date in the future, using the forward exchange rate. The swap facility gives an incentive to banks to export the funds, generating an offset-ling capital outflow. This can be achieved by pricing the swap in such a way that the difference between the spot rate and the forward rate is bigger than the interest rate differential between the foreign and domestic markets. If the swap market is liquid, they can be traded whenever necessary at the prevailin; market rates in a similar way to open market operations in the domestic market. Nevertheless, like open market operations, swaps can cause losses for the central

bank, especially when it is giving away favourable margins on the interest rate differentials. There is also a risk that foreign exchange sold by the central bank could be sold back against the loca! currency, nullifying the intended effect.

e). Widening Exchange Rate Bands

In 1992 and 1993, respectively, in response to large and persistent capital inflows, Chile and Colombia have widened the exchange rate band for their currencies. By allowing some exchange rate appreciation, import prices tend to fall, therefore, the inflation rate will go down, and hence, reducing the need to sterilize all capital inflows. A wider band gives more flexibility for the central bank to intervene in the foreign exchange market, which can be important if there is a sudden reversal of sentiment. A wider band, however, can be disruptive to the economy as a whole since it can provoke large and sudden inflows or outflows of capita!. It can aiso have the perverse effect of stimulating expectations that the rate may devalue if the market believes that the central bank is trying to improve export competitiveness rather than to bear down on inflation. Before the currency crisis started in July 1997, Indonesia and Malaysia have responded to the surges of capital inflow by widening their intervention bands for their exchange rate pegs. This action resulted in a greater exchange rate flexibility.

f). Intervening in Forward Exchange Market

By offering a forward exchange facility, the central bank gives domestic investors the opportunity to hedge the vaiue of their foreign investments by locking in a forward exchange rate. It can thereby encourage offsetting capital outflows. Offering a forward exchange facility, however, can aiso be risky. To the extent that it exposes the central bank to financial losses, it can have fiscal costs. To avoid such costs, the central bank needs to refrain from offering excessively favourable premiums above the existing interest differentials. The best way to make forward exchange intervention more effective is to encourage the private sector's demand for forward transactions, enhancing the liquidity and efficiency of the forward market as adopted in Korea in 1994.

g). Easing Restrictions on Capital Outflows

Philippines and Thailand ease capital outflow restrictions to sterilize their capital inflows. Relaxing restrictions on outflows may include such measures as easing surrender requirements on foreign exchange earnings, permitting local institutions to make investments abroad, or allowing nondomestic entities to issue local currency bonds in the domestic market. Unfortunately, such measures may also be self-defeating. Simplifying the process for exporting capital, for instance, may itself increase confidence in the exchange system, hence, encouraging more inflows. In countries that have accumulated large external debts, such changes could exacerbate the threat of a large and prolonged current account deficit.

h). Interest Equalization Taxes

Interest equalization tax have direct impact on inflows and outflows of capital. If the tax is applied for capital inflow purposes, it could be called a capital import tax. When imposed on outward-bound transactions, the tax is imposed on the acquisition of foreign securities by domestic investors. For domestic agents, it effectively increases the cost of foreign capital, bringing it more into line with ioca! rates. The main advantage of the tax is that it can exert an influence on the exchange rate without the need for changes in interest rates of intervention in the currency markets. This method also shares the disadvantages of other capital controls, including the administrative costs of implementation. It can raise the cost of capita! and distort the allocation of resources.

i). Fiscal Contraction and The Use of Government Pension Funds

Sterilization of capital inflows could also involve fiscal contraction (adopted in Thailand) and the use of the government pension funds (Malaysia and Singapore). To the extent that they restrict the provision of physical and social infrastructure, fiscal contractions can retard growth. Furthermore, fiscal contractions could be viewed as increased fiscal discipline and hence as a sign of the government's commitment to structural reforms. This would tend to attract more capital inflows. Beside, regulations over the use of govenment pension funds introduce microeconomic distortions that could retard growth.

Countries tend to rely more on nonbank sterilization due to the practical difficulties of relying on bank sterilization alone. Bank sterilization has tended to be temporary, and the offset to bank sterilization via increased capital inflows has become much more problematic. The resort to nonbank sterilization confirms the difficulties in trying to maintain pegged exchange rates and monetary independence. Sterilization in a pegged exchange rates economies with continued deregulation of the financial sector does not appear to be viable (Leung, 1996, p.16).

CONCLUSIONS

Asian-Pacific countries are no exception to the impossible trinity. It appears that maintaining pegged exchange rates and the recent pace of financial deregulation while sterilizing capital flows are ineffective. Meanwhile, maintaining pegged exchange rates and reintro-ducing credit rationing and more stringent controls over capita! flows appear to be more costly and unsustainable as a long-term strategy. Therefore, countries should move towards greater exchange rate flexibility and maintain the momentum of domestic financial reforms.

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