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Working Paper

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ADBI Discussion Paper, No. 100

Provided in Cooperation with:
Asian Development Bank Institute (ADBI), Tokyo

Suggested Citation: Kawai, Masahiro; Takagi, Shinji (2008) : A survey of the literature on managing capital inflows, ADBI Discussion Paper, No. 100, Asian Development Bank Institute (ADBI), Tokyo

This Version is available at:
https://hdl.handle.net/10419/53527

A Survey of the Literature on Managing Capital Inflows

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March 2008

ADB Institute Discussion Paper No. 100

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This discussion paper is part of the "Managing Capital Flows: Search for a Model" project.

Suggested citation:

Kawai, Masahiro, and Shinji Takagi. 2008. A Survey of the Literature on Managing Capital Inflows. ADBI Discussion Paper 100. Tokyo: Asian Development Bank Institute. Available: http://www.adbi.org/discussion-paper/2008/03/27/2514.managing.capital.inflows.lit.survey/

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Abstract

How to manage capital inflows remains an important policy issue for many emerging market economies. This paper presents a brief survey of the literature on managing capital inflows, with a focus on developing and emerging market economies. The paper, after discussing the economic characteristics of capital inflows, provides an overview of the evolution of thinking on capital account liberalization, the use of capital controls as an instrument of managing capital inflows, and the effectiveness and limitations of conventional macroeconomic and structural instruments. Although the literature is still evolving, it provides little practical guidance on capital account liberalization. For those countries facing a surge in capital inflows, consensus seems to be that, aside from learning to live with an appreciating (and fluctuating) currency, and strengthening the financial system, there is no effective and sustainable policy measure either to reduce the size of inflows or to prevent the adverse consequence of such inflows. Additional work is especially needed to develop tools to identify and quantify the various risks of capital inflows.

JEL Classification: F21, F32, F34

Contents

I. INTRODUCTION

This paper presents a brief survey of the literature on managing capital inflows, with a focus on developing and emerging market economies. Background papers prepared for this report, Grenville (2008) and Schadler (2008), from which some parts of this paper are drawn, provide additional perspectives on the issues discussed here. Grenville (2008) discusses the macroeconomic consequences of capital inflows and how policy should respond to them (as well as how to manage a crisis when it occurs), while Schadler (2008) draws lessons on policy options from over 90 recent episodes of large capital inflows.

The rest of the paper is organized as follows. Section II discusses the economic characteristics of capital inflows, including a review of empirical work on the benefits of free capital mobility. Section III provides an overview of the evolution of thinking on the pace and sequencing of capital account liberalization. Section IV discusses the use of capital controls as an instrument of managing capital inflows, while Section V reviews the effectiveness and limitations of conventional macroeconomic and structural (microeconomic) instruments. Finally, Section VI presents concluding remarks.

II. CHARACTERISTICS OF CAPITAL INFLOWS

Measuring the Benefits of Capital Mobility

In a perfect world, capital moves from a country with a lower rate of return to a country with a higher rate of return. Compared with what would be the case under autarky, the higher-return country both invests and consumes more in the current period, and consumes more in the future while paying back the interest on international borrowing from greater income. On the other hand, the lower-return country produces more but invests less in the current period, and augments its consumption in the future from the interest income from international lending. It is easy to show that welfare is improved in both countries as interest rates are equalized internationally. In a perfect world, free capital mobility is welfare-enhancing (Fischer, 1998).

There is disagreement over the benefits of unfettered international capital flows because we do not live in a perfect world. There are at least three reasons why free capital flows may not be optimal (Eichengreen et al., 1998; Cooper, 1999; Stiglitz, 2000). First, information is imperfect and asymmetric, especially in financial transactions. It is not possible to know the rate of return from investment with certainty, and borrowers typically know more about the probability of repayment than the lender. Neither is there a guarantee that borrowed funds are invested as promised. Second, there can be distortions in the real economy. If certain industries are protected for political reasons, capital inflows could reduce welfare by increasing production in industries with little comparative advantage. Third, the marginal rate of tax on capital differs from country to country. Thus, capital may in reality flow from a high tax country to a low tax country, irrespective of the productivity of capital.

Much of the empirical work on the benefits of capital flows has focused on the contribution of capital account openness to economic growth. Although capital inflows should at least in theory contribute to faster growth (especially in developing countries) through more efficient resource allocation, enhancing domestic savings, and transferring technological or managerial know-how, evidence is inconclusive at best (see Edison et al., 2002 for a survey).[1] For example, while Quinn (1997) finds a positive association between capital

[1] Empirical work involves a joint test of the effect of liberalization on growth and the particular method of quantifying the degree of liberalization or effectiveness of capital controls. Empirical results are therefore sensitive to the quantitative measure of capital account openness as well as the choice of sample and methodology. Another complication is the endogeneity of capital controls, which makes it difficult to disentangle

account liberalization and economic growth, Grilli and Milesi-Ferretti (1995) and Rodrik (1998) fail to find any such relationship. The more recent study of Prasad et al. (2003), by using the ratio of the gross stock of foreign financial assets and liabilities to GDP as the measure of capital account openness, concludes that financial integration is neither a necessary nor a sufficient condition for achieving a high rate of growth.

The inconclusiveness of these studies may be due to a fundamental misspecification of the way they test the benefits of capital account openness. It may be that the growth-enhancing effect of openness is a one-time event (such as a permanent increase in the level of GDP) that follows an opening of the capital account in a given country, rather than permanent differences in growth rates across countries. A series of studies that directly tested the one-time benefit of a discrete change in capital account policy—which Henry (2007) calls the policy-experiment approach—have drawn a much less ambiguous conclusion about the positive impact of stock market liberalization on growth and investment.[2] For example, Henry (2000) used event study techniques to show that stock market liberalization was followed by a temporary increase in the growth rate of private investment in major emerging market economies, while Bekaert et al. (2005) gave evidence that the impact of stock market liberalization on real per capital GDP growth was one percent on average for a large number of countries.

The positive impact of capital account openness on growth is also less ambiguous for foreign direct investment (FDI). Reisen and Soto (2001), for example, examined the panel data for 44 countries over 1986–97 to find that FDI (as well as equity) inflows, but not any other type of capital inflows, are positively correlated with subsequent economic growth. Moreover, there is some evidence of a "threshold effect," whereby a country's absorptive capacity must exceed a certain amount in order to exploit the benefits of capital inflows (Prasad et al., 2003; also Arteta et al., 2001; and Eichengreen and Leblang, 2002). This may reflect the role of human capital in translating capital inflows into productive activities (Borensztein et al., 1998) or the possibility that FDI inflows, the type of inflows known to contribute to growth, are attracted only to countries with a sufficient degree of governance or rule of law.

Empirical evidence on the other theoretical benefits of capital account openness is limited, but available evidence seems to suggest that, contrary to a theoretical prediction, developing countries with larger financial flows typically experience greater volatility in consumption. Kose et al. (2003), for example, show that the volatility of consumption relative to income rose from the 1980s to the 1990s for "more financially integrated developing countries" while the volatility fell for both industrial countries and less financially integrated developing countries. This implies that the risk diversification role of international capital flows has been of limited usefulness for developing countries.[3] As noted in Prasad et al. (2003), the limited risk diversification role of capital account openness may be related to the procyclicality of developing country access to international capital markets, such that they tend to receive more inflows when times are good than when they are bad (Kaminsky et al., 2004). As an extreme case of greater volatility, some emerging market economies experienced a "sudden

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the effect of capital controls per se from that of the macroeconomic and international environments within which they are introduced.

[2] These studies have focused on stock market liberalization because, compared with other types of capital account liberalization, it is a more easily identifiable policy shift and its theoretical prediction is clearer. Martell and Stulz (2003) compare the equity market liberalization of a country to the initial public offering (IPO) of a firm.

[3] Tesar (1995), noting that international consumption correlations were generally low, argued that the utility gains from international risk sharing were small even among industrial countries. Recent data seem to suggest that consumption correlations have increased considerably among industrial countries.

stop" (Dornbusch et al., 1995; Calvo and Reinhart, 2000) in international capital inflows in the 1990s and early 2000s, with a severe adverse impact on macroeconomic performance.[4]

Recent Features of Capital Flows

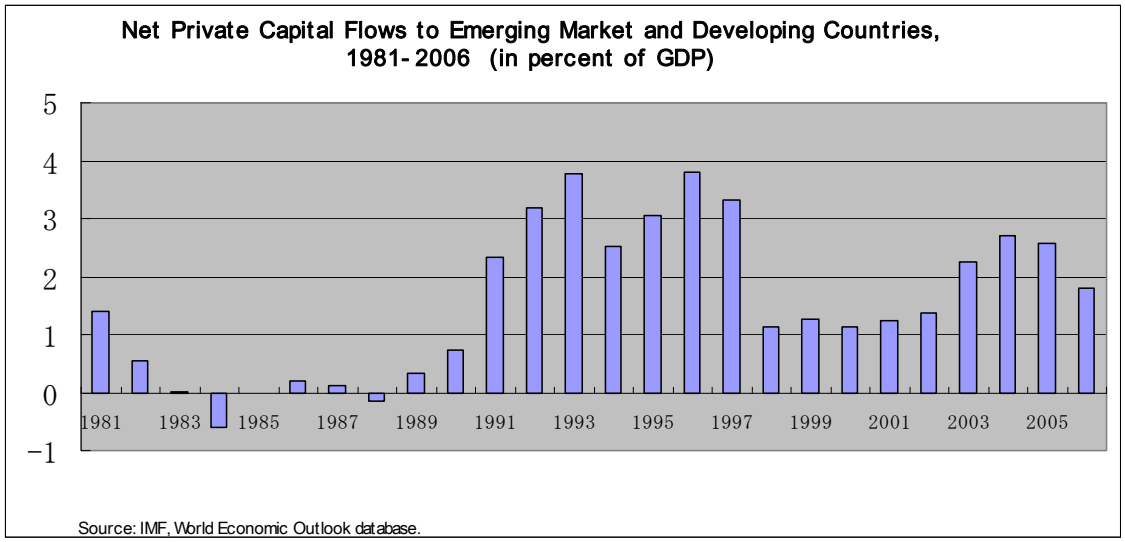
The post-WWII international monetary system was based on the notion that unfettered international capital flows were not welfare-enhancing. The idea that free capital mobility is incompatible with a free trading system was well accepted in academia and the mainstream policymaking community when the International Monetary Fund (IMF) was established (Bloomfield, 1946). Consequently, the IMF Articles of Agreement granted member countries the right to maintain controls over capital transactions, though not on current transactions (see also James, 1996). It was only in the context of extensive trade liberalization that the majority of industrial countries began to liberalize capital flows as, given a degree of substitutability between current and capital transactions, capital controls became less effective and more distortionary.[5] More recently, an increasing number of emerging market and developing countries have followed suit.

Cyclicality has been an important feature of capital flows into emerging and developing countries (see figure; see also Schadler, 2008 for more discussion). Capital flows almost dried up in the early 1980s in the aftermath of a developing country debt crisis, but they increased sharply in the early 1990s. In the background was the liberalization of the capital account in an increasing number of emerging market economies in Asia, Latin America and Eastern Europe, but there were also various "pull" and "push" factors. The pull factors included the higher rate of return on capital and the improved investment climate in these countries, which had resulted from a series of trade, financial and other economic liberalization measures and the development of a legal framework to protect investor rights. On the other hand, the push factors included low interest rates, slow growth and the lack of investment opportunities, and deregulations that allowed greater global risk diversification in industrial countries. Chuhan et al. (1998) showed that, during 1988-92, the pull factors were more important in Asia, while they were as important as the push factors in Latin America (see also Fernandez-Arias and Montiel, 1995; Calvo et al., 1996).

The magnitude of capital inflows experienced by some of these countries, especially in Asia, was massive indeed. For example, the total volume of capital inflows amounted to 52 percent of GDP in Thailand and 46 percent in Malaysia between 1988 and 1995. As country after country experienced an accumulation of international reserves and an expansion of the money supply (under a dollar peg policy), a current account deficit (as a counterpart of capital inflows), a rapid rise in equity and real estate prices, and expanding domestic consumption, the challenge of addressing the economic consequence of large capital inflows began to be referred to as the "capital inflow problem."

[4] Calvo and Reinhart (2000) show that a sudden stop of capital inflows has been a recurring feature of currency crises in emerging market economies, but not in advanced industrial economies.

[5] Abdelal (2007) discusses the place of capital transactions in the international monetary system. See Thiel (2003) for the role played by the Organisation for Economic Co-operation and Development (OECD) in the liberalization of capital flows among industrial countries.



A sharp decline that followed the 1997 East Asian crisis was reversed with a sudden recovery in 2003, which may well have been the beginning of another upward cycle. During the recent wave, however, the nature of the inflows appears to have changed. Whereas in the 1990s inflows into emerging markets occurred against the background of a large current account deficit, the emerging market economies more recently have registered a current account surplus collectively. This is particularly pronounced among the Asian countries, where they have been *net* capital exporters though their *gross* inflows have been large. Not only has this presented the countries with greater currency appreciation pressure than during the previous episode of inflows, but it has also raised the interesting question as to whether it is only net inflows that matter for policymakers or whether gross inflows also matter (Schadler, 2008).

It must be acknowledged that emerging markets are inevitable recipients of capital inflows in the process of building their capital labor ratio up to the levels prevailing in mature economies (Grenville, 2008; Schadler, 2008). At the same time, it is difficult to believe that capital flows can be so volatile if they are driven by such fundamental economic factors alone. Recent experience suggests that there is also a geographical component to the pattern and size of net capital inflows (which Schadler [2008] calls the “neighborhood” effect). For these reasons some believe that speculation, herd behavior and other non-economic factors play a significant role in the determination of capital flows (Cooper, 1999). Indeed, there is some empirical evidence to suggest that foreign investors tend to display greater herding behavior than domestic investors in emerging stock markets (see Bikhchandani and Sharma, 2001).

Controlling the Risks of Capital Inflows

In considering the risks of capital inflows and the possible policy responses to them, we must make a clear distinction between two types of inflows. One is inflows that are driven by fundamental factors (such as a disparity in capital labor ratios across countries) and thus expected to be sustained over time. Emerging markets that open the capital account provide the world with profitable investment opportunities through higher interest rates; moreover, the existing stock of financial assets in those economies may also become attractive to foreign investors. Under these circumstances, countries must accept the inevitability of a pickup in international capital inflows and an appreciating real exchange rate (Grenville, 2008). The other type of capital inflows is not driven by economic fundamentals and may

thus be reversed in the future. In some sense, such capital inflows can legitimately be considered "excessive" relative to some sustainable or desirable level.

Regardless of the type, the rationale for managing capital inflows rests on the presence of an imperfection, whether it is in the absorptive capacity of a recipient or the nature of the inflows themselves. Recent experience shows that, with a weak regulatory framework, large capital inflows can exceed the absorptive capacity of a country's banking system, leading to inappropriate lending decisions and a subsequent buildup of financial system fragility. If capital flows are largely driven by economic fundamentals but the absorptive capacity is weak, the challenge to policymakers is not to stop the capital inflows or to prevent the real exchange rate appreciation altogether but to align the magnitude to the capacity in the short run while building the necessary infrastructure, including the risk management skills of financial institutions. If capital flows are driven by speculation or herd behavior, the challenge is more daunting. Policymakers must somehow limit the emergence of an asset price bubble and the country's vulnerability to capital flow reversal, including from contagion from elsewhere.

Although how to measure the risks of capital inflows is a complex issue, we can at least conceptually consider the following three types of risks:

- Macroeconomic risks. Capital inflows could accelerate the growth of credit (or even create loss of monetary control), cause the real exchange rate to appreciate, cause inflation, and affect other macroeconomic variables in a way inconsistent or incompatible with immediate domestic policy objectives, such as price stability, exchange rate stability, and export promotion (see Fernandez-Arias and Montiel, 1995). Grenville (2008), however, argues that the macroeconomic consequences of recent capital inflows have not been so large, those including on monetary control and inflation, though the impact on real exchange rates may have been (Schadler, 2008).

- Financial stability risk. Capital inflows could push up equity and other asset prices, reduce the quality of assets, and adversely affect the maturity and currency composition of the balance sheets of the private sector (particularly banks and corporations), thereby contributing to greater financial fragility. Recent experience suggests that the impact of capital inflows on asset prices has been particularly significant (Grenville, 2008; Schadler, 2008).

- Risk of capital flow reversal. Capital inflows could reverse themselves suddenly, with a potential for the depletion of reserves or sharp currency depreciation. Schadler (2008) notes that about 15 percent of the capital inflow episodes over the past 20 years ended in crisis.[6] It is mainly against this crisis risk that many countries in Asia have accumulated large foreign exchange reserves as a form of self-insurance.

Conventional wisdom in the economics literature has typically focused on the third type of risk and holds that long-term flows are less risky than short-term flows because they are presumably less speculative (Claessens et al., 1995; Carlson and Hernandez, 2002); the ratio of short-term debt to reserves, for example, has been shown to increase the probability of currency crisis (see Rodrik and Valasco, 1999). Among the long-term flows, FDI flows are considered particularly desirable because they are related to underlying real considerations and also empirically less reversible (Chuhan et al., 1996; Lipsey, 1999; Schadler, 2008). Athukorala (2003) shows in the context of the East Asian crisis that no major discontinuity in

[6] The definition of a crisis is based on three metrics: (i) a depreciation grater than 20 percent; (ii) a drop in real government primary expenditure exceeding 20 percent of GDP; and (iii) a drop in output.

FDI inflows (except for a brief and modest decline) was detected in the region, with only a limited outflow at the height of the crisis.

The post-Asian crisis policy debate focused on vulnerabilities inherent in the balance sheet of an economy, especially maturity and currency mismatches (Allen et al., 2002). A maturity mismatch refers to a gap between the maturity structure of assets and liabilities, while a currency mismatch arises when assets and liabilities are denominated in different currencies. Vulnerabilities develop when assets are long term and liabilities short term or when assets are denominated (or revenues are due) in domestic currency and liabilities are denominated in foreign currency.[7] These balance sheet risks are minimized when countries borrow more long term and less in foreign currencies. Some have highlighted the imperfections in the global financial market that limit the ability of emerging market economies to borrow abroad in their own currencies ("original sin") as a factor responsible for the currency mismatch that typically builds up in emerging market balance sheets (see Eichengreen et al., 2003 for a discussion of the relationship between currency mismatch and original sin), and suggested the need to develop local currency bond markets (Burger and Warnock, 2006).[8]

The conventional wisdom notwithstanding, determining the precise risk characteristic of a particular capital transaction in practice is not a simple matter. Especially in a financially liberalized, open economy, what ultimately determines the associated crisis risk is the liquidity of the instrument, not necessarily the maturity or the currency of denomination.[9] With sufficient liquidity, domestic currency-denominated bonds (or equities and FDI positions, for that matter) can easily be sold by foreign investors in the secondary market, and the proceeds can be exchanged for foreign currency in the foreign exchange market. Detragiache and Spilimbergo (2001) found for 1971–98 that the probability of debt default was not influenced by the amount of short-term debt once adjustment was made for the endogeneity of maturity structure (see also Frankel and Rose, 1996 for a similar result).[10] Jomo (2003), noting that the 1997 exodus of foreign investors forced market capitalization to fall to a fourth of its peak value, draws a lesson from the Malaysian crisis that equity flows are "more easily reversible." Bussiere and Mulder (1999) give evidence that a higher ratio of FDI to GDP was not significantly associated with less crisis vulnerability during 1997–98, especially with a large current account deficit and an overvalued exchange rate.

In short, the risk of capital inflows is specific to each transaction. Measuring the risk requires a "forensic investigation," in the words of Andrew Sheng (2008, p. 19), because each capital transaction has its own unique characteristics and works through the financial system differently. Even for FDI, not all flows are equal. Jinjarak (2007), for example, provides empirical evidence that vertical FDI activity (in which the output of subsidiaries is exported back to the parent abroad) is much more sensitive to host country risks than vertical FDI (see Aizenman and Marion, 2004 for the underlying theory). Based on the experience of Malaysia, Doraisami (2007) highlights a macroeconomic risk of FDI by noting that substantial FDI inflows had created a large export sector and made the country vulnerable to a sudden decline in export growth. A policymaker must conduct a sort of simulation exercise to know the macroeconomic, financial and reversal risks of a capital inflow by tracing how it moves through the system and, in the event of a sudden withdrawal, what the likely impact of it would be.

[7] Another source of balance sheet vulnerability is domestic liability dollarization, which has been shown to increase the probability of sudden stops in emerging market economies (Calvo et al., 2004).

[8] Reducing the currency mismatch only shifts the exposure to foreigners. Grenville (2008) notes that, unless foreign investors are more stable holders of currency exposure, the vulnerabilities remain.

[9] At the time of a crisis, however, otherwise liquid assets may become highly illiquid, limiting the ability of investors to sell them without incurring a substantial capital loss.

[10] Countries that are more at risk of default may become unable to borrow at long maturities. If long-term borrowing does not reduce the risk of crisis, it is not clear if an economy benefits by borrowing long term, given a higher premium on long-term debt (Alfaro and Kanczuk, 2007).

III. PACE AND SEQUENCING OF CAPITAL ACCOUNT LIBERALIZATION

For countries that are still in the process of opening the capital account, how best and how fast to proceed remains an unresolved issue. There is no presumption that the resource requirements of implementing a quick transition are either smaller or larger than those of managing a long transition process or administering capital controls (see Nsouli et al., 2002 for a discussion of several conceptual issues). Developing effective regulatory frameworks takes time, but a lengthy process may create wrong incentives and distortions. There are also political considerations. A big-bang approach may be appropriate if a prolonged transition is likely to create resistance from vested interests or if different elements of the existing system are so dependent upon each other that a piecemeal reform is not possible without creating significant distortions. A gradualist approach, on the other hand, may be more appropriate if it takes time to build consensus or if a slower process is more conducive to minimizing the adjustment costs.

The early contributions to the scholarly literature were based on the "Southern Cone" experience of Argentina, Chile and Uruguay in the late 1970s, and emphasized the importance of achieving macroeconomic stabilization, financial liberalization, and trade liberalization before opening the capital account (McKinnon, 1982; Edwards, 1984). The literature then shifted toward advocating the big-bang approach in the early 1990s, particularly in the context of transition economies, arguing that the lack of credibility in the reform made it more appropriate to act quickly (Funke, 1993). In extending the big-bang approach to non-transition contexts, some argued that the best route to an efficient financial sector was to liberalize the capital account quickly, as it would allow market discipline to operate on the banking system (Guitian, 1996). Others used the presumed ineffectiveness of capital controls to argue for faster liberalization, given their distortionary effects (Mathieson and Rojas-Suarez, 1993).

The emerging market crises of the 1990s were a watershed event in the evolution of thinking on the pace of capital account liberalization. Although they were all complex phenomena with multiple causes, some saw in them a role played by capital account liberalization. These observers recognized that liberalized systems could create dangers by allowing market participants to "undertake greater and sometimes imprudent risks," so that "sound prudential policies to ensure proper private incentives for risk management" would be necessary to safeguard the benefits from capital account liberalization (Eichengreen et al., 1998, p. 1 . It was in this context that "sequencing" emerged as an operational concept in the policy-oriented literature, largely developed at the IMF.

The new sequencing literature stresses the importance of an "integrated" approach, which considers capital account liberalization as part of a more comprehensive program of economic reform and coordinates it with appropriate macroeconomic and exchange rate policies as well as policies to strengthen the financial system (Johnston et al., 1999). In this approach, emphasis is placed on the sequence by which the necessary preconditions—including not only current account liberalization, macroeconomic stability and financial sector liberalization but also establishing an effective system of prudential supervision—are to be met and the various components of the capital account are to be liberalized. IMF staff has developed an operational framework, based on several sets of country experience, to sequence capital account liberalization in coordination with other closely related policies (Ishii et al., 2002).

The integrated approach acknowledges that no simple rule exists for sequencing, and that the detailed plan for coordinating capital account liberalization with other policies must be based on an assessment of specific circumstances and therefore requires judgment (Ingves, 2003). Subject to this disclaimer, the broad principles are to pursue macroeconomic policies and structural reforms that promote financial sector stability, while gradually liberalizing the

capital account as preconditions are met. Elements of sound macroeconomic policies might include fiscal discipline, prudent external debt management, a flexible exchange rate, and transparency in the conduct of monetary and exchange rate policies. Financial policies must be designed to promote prudent risk management, supported, among others, by a strong capital base and strict disclosure requirements. As these conditions are met, FDI is liberalized first, followed by portfolio flows. Consistent with the conventional wisdom, long-term flows are to be liberalized before short-term flows.

While few would disagree with the concepts embodied in this approach, it has proved difficult to apply in practice. The Asian Policy Forum (2002, p. 4) described this as including "virtually every conceivable aspect of microeconomic, institutional, and macroeconomic policy possible," "unnecessarily complex," and "unoperational." The exhortation that one must gradually open the capital account by pursuing good policies, establishing good institutions, and paying attention to attendant risks, is hardly an operational guide to policy, especially when it does not explain how to measure risks and provide clear criteria for prioritizing them. As already noted, it is a complex task to measure the risks of capital inflows. But as long as risks are not properly identified, any approach to capital account liberalization can only be based on intuition and guess work.

There is also an issue of feasibility. The conventional argument that certain types of inflows should be liberalized before others may not work in practice. For example, much has been said about the "wrong" sequencing followed by the Republic of Korea in liberalizing short-term bank flows before long-term portfolio flows (Cho, 2001). However, different types of short-term capital transactions are highly substitutable not only for each other, but also for long-term capital transactions. The Thai experience shows that, when the authorities tightened control over short-term Bangkok International Banking Facility (BIBF) inflows in 1995,[11] inflows through loans, portfolio investment, and nonresident bank deposits rose markedly so that the overall volume was little affected (Siamwalla et al., 2003).

Although the new orthodoxy on capital account liberalization may have served as a deterrent to rapid capital account liberalization, countries with a partially open capital account usually do not have the luxury of time with which to establish all the right preconditions. With economic liberalization, it becomes increasingly difficult to maintain comprehensive capital controls, making any remaining controls necessarily selective. They are inherently distortionary. In addition, as greater trade flows create loopholes in the control regime, any remaining controls are bound to lose effectiveness over time. For example, multinational corporations can sell goods and services to overseas parent firms at very low bookkeeping prices, thereby transferring real value out of the country, while foreign investors wanting to circumvent the controls can swap their funds for the overseas assets of a domestic resident. In the words of Eichengreen et al. (1998, p. 27), there is therefore "no generally applicable cookbook recipe for the sequence of steps to undertake" in capital account liberalization.

IV. USE OF CAPITAL CONTROLS

Some countries with an otherwise open capital account have experimented with the use of direct controls on inflows (see Ariyoshi et al., 2000 for a selective review; also Independent Evaluation Office [IEO, 2005]). More recently, Russia and Croatia introduced controls in

[11] The BIBF was established in 1993, with the stated objective of making Bangkok an international financial center by providing tax benefits to international banks. Responding to a subsequent surge in short-term capital inflows, in 1995, the authorities introduced various measures, including a 7-percent reserve requirement on non-resident baht accounts with a maturity of less than one year and on short-term borrowing of finance companies; limits for open short and long foreign currency positions (with lower limits for short positions); and reporting requirements for banks on foreign exchange risk control measures (Johnston et al., 1999). To target the BIBF in particular, they also raised the minimum level of "out-in" flows from $500,000 to $2 million (Siamwalla et al., 2003).

2004 and, in December 2006, Thailand followed in an attempt to stem the tide of capital inflows and the resulting appreciation pressure on the currency.[12] These recent controls have typically taken the form of unremunerated reserve requirements (URRs) that mandate a certain percentage of inflows to be deposited with the central bank for a given period of time.[13] These controls also tend to be temporary as the countries have been the beneficiaries of substantial capital inflows in the past and no longer have the option of isolating themselves permanently from the rest of the world. The controls are lifted when the triggering situation ceases to exist.

URRs are different from the conventional controls at least in three respects. First, URRs are designed for a country with an otherwise open capital account to manage—not prevent—capital inflows. Second, they work on capital inflows not through administrative means but through the price incentives of international investors. Third, the amount of "tax" on capital inflows is negatively related to the length of the investment. Hence, URRs are more effective on short-term (and presumably more speculative) flows than on long-term flows that are believed to be driven more by fundamental economic factors. For these reasons, URRs are considered to be less distortionary and abrasive, and have received sympathy even from some advocates of free capital mobility (Fischer, 1998).

There is a large empirical literature on the effectiveness URRs based on the experience of Chile in the 1990s. The results remain inconclusive not only because they are sensitive to the choice of methodology as in any empirical work but more importantly because URRs were endogenous to the volume of capital flows.[14] Broad consensus, however, seems to be that: (i) URRs reduced the volume of capital inflows in the short run, but lost effectiveness over time; (ii) they lengthened the maturity of inflows; (iii) they were effective in raising relative domestic interests but not in preventing real exchange rate appreciation; and (iv) they had greater (adverse) impact on small and medium-sized firms (that rely on bank borrowing) than large firms with access to a wider range of financing instruments (Nadal-De Simone and Sorsa, 1999; Gallego et al., 2002; Le Fort and Lehmann, 2003; Ffrench-Davis and Tapia, 2004). In terms of financial vulnerability, Edwards (1999) provides preliminary evidence that URRs might have protected Chile's financial markets from small shocks originating abroad though not from contagion from very large shocks, such as during the East Asian crisis.

Based on a broader group of countries, Dooley (1996) argued that the empirical literature was generally skeptical of the ability of capital controls to affect such variables as the volume or composition of private capital flows, international reserves, or the level of exchange rates, especially in the longer run. The more recent review of empirical literature by Magud and Reinhart (2007) concludes that capital controls can alter relative interest rates and lengthen the maturity of inflows, but cannot reduce the volume of net flows (their effect on real exchange rates is uncertain).[15] While the macroeconomic effect may be limited, the microeconomic effect is less ambiguous. Desai et al. (2006) provide evidence that capital controls raise local borrowing costs for affiliates of multinational corporations and, coupled with the cost of circumventing the controls, discourage FDI inflows. Wei and Zhang (2007), based on a large sample of countries, provide some evidence that exchange controls,

[12] Following the introduction of a 30-percent reserve requirement, stock prices declined sharply, prompting the authorities to announce that the control measure would not apply to foreign inflows to the Thai stock exchange.

[13] URRs have precedents in the earlier capital control regimes of some industrial countries, such as Japan and Australia in the 1970s. The Japanese authorities, for example, managed the volume of capital inflows by altering the rate of marginal reserve requirement on so-called free-yen accounts for non-residents.

[14] In Chile, URRs were frequently revised in response to the strength of capital inflows, in terms of both coverage and reserve requirements.

[15] The empirical works reviewed by Magud and Reinhart (2007) covered the controls introduced by Brazil, Chile, Colombia, the Czech Republic, Malaysia, and Thailand mostly in the 1990s. The overall conclusion, however, is heavily weighted by the experience of Chile, for which much more work has been done.

including capital controls, reduce trade presumably because firms face a higher cost of meeting the associated inspection and reporting requirements.[16]

Experience suggests that capital controls lose more of their effectiveness as they become more permanent because time will allow economic agents to find ways of evasion. Controls that are introduced in an otherwise liberalized regime are also necessarily selective, and are therefore less effective than the comprehensive controls of a tightly controlled regime that cover all transactions. In a highly open economy with a commitment to transparency and accountability, there is a limit to the coverage of capital controls and the rigor with which they can be enforced (Schadler, 2008). Some transactions thus become inevitably exempted from the application of controls, making any remaining controls less effective as well as more distortionary as exempted transactions create loopholes. In surveying the empirical literature on the microeconomic effects of capital controls, Forbes (2007) concludes that evidence indicating distortions in the allocation of resources is compelling.

A more promising alternative to the use of transaction-based capital controls may be "prudential" regulations, to the extent that, being targeted at financial institutions and large corporations, they are easier for the authorities to monitor and enforce.[17] Such measures might include reporting or approval requirements, making prescribed institutions eligible for capital transactions, limits on short-term external borrowing, and limitations on foreign currency exposure. Although coverage is necessarily limited, they can still be expected to control a significant portion of capital inflows. Grenville (2008) argues that limiting the role of financial institutions in intermediating inflows and subjecting the exposure of their customers to prudential scrutiny would help contain the adverse impact of a currency crisis.

Investor-based controls are another promising alternative to transactions-based controls, at least as a tool of managing the process of liberalization. For example, the use of such devices as the qualified foreign investor scheme in the People's Republic of China (PRC) and the foreign institutional investor (and more recently non-resident Indians or NRI) classification in India seem to have a measure of effectiveness in managing the process of capital account opening, presumably because it is always easier to track down who is investing than how inflows are coming. Kimball and Xiao (2005) show that, for the period 1996–2004, The PRC's financial openness and capital flow volatility were considerably lower than those for other emerging market economies, indicating the effectiveness of capital controls. Shah and Patnaik (2005) likewise note that India has experienced a rapid expansion of capital inflows in recent years without experiencing a corresponding increase in volatility (despite the relatively small share of FDI).

Administrative capacity is a prerequisite for the effectiveness of any capital control measure, prudential or otherwise. Johnston and Ryan (1994) show, from a sample of 55 countries during 1985–92, that capital controls were more effective in industrial countries than in developing countries, reflecting the difference in the competence of bureaucratic systems. Among the emerging market economies, bureaucratic competence is credited for the reasonable effectiveness with which capital control measures were enforced in Chile and Malaysia during the 1990s (Kawai and Takagi, 2004).

[16] It should be noted that the authors do not make a distinction between capital controls per se and other types of exchange controls that affect foreign exchange transactions.

[17] Though on the outflow side, evidence suggests that Japan's prudential controls on the foreign investment behavior of institutional investors (such as insurance companies) were effective. See Fukao (1990) and Koo (1993).

V. MACROECONOMIC AND STRUCTURAL MEASURES TO MANAGE CAPITAL INFLOWS

If capital inflows are driven largely by economic fundamentals, authorities must sooner or later accept the inevitability of allowing the real exchange rate to appreciate. In fact, real exchange rate appreciation is the only sustainable response to a permanent increase in capital inflows and a fundamental revaluation of domestic relative to foreign assets. Exchange rate appreciation is also the most effective response to large capital inflows, regardless of the cause of the inflows, because it avoids the myriad of limitations and side-effects attendant to other policy responses (see below). This is how most industrial countries respond to large capital inflows.

Policymakers, however, are generally reluctant to allow the exchange rate to appreciate. Many emerging market economies are more limited than industrial countries in the depth of financial markets, industrial diversification, and risk tolerance to allow the exchange rate to fluctuate widely in response to a sudden (and especially temporary) surge in capital inflows. Grenville (2008) notes that emerging market currencies are particularly subject to sudden "gyrations" during the transition to mature market status, because there is no anchor that guides the path of the exchange rate as the currencies appreciate in real terms over time.

Moreover, loss of international price competitiveness is an overriding concern of the authorities when they resist allowing the exchange rate to appreciate. Preventing the real exchange rate from appreciating may not be a sustainable policy over the long run, but it takes time for capital inflows to work through the system to have impact on inflation (hence to cause real appreciation), whereas nominal appreciation will lead to an immediate adjustment in the real exchange rate.

Macroeconomic Measures

In general, three broad categories of macroeconomic measures are available to countries facing surges in capital inflows, if they are not willing to allow the nominal exchange rate to appreciate: (i) sterilized intervention (sterilization), (ii) greater exchange rate flexibility, and (iii) fiscal tightening (preferably through an expenditure cut). During earlier episodes of large inflows, each of these measures was used by various countries, with differing degrees of intensity and effectiveness (Schadler et al., 1993; Fernandez-Arias and Montiel, 1995; IEO, 2005; IMF, 2007; Grenville, 2008; and Schadler, 2008).

First, **sterilization** has been the most commonly used instrument; Reinhart and Reinhart (1998) call it "the policy of first recourse." Narrowly defined, sterilization involves the exchange of domestic bonds for foreign assets, often through open market operations, designed to neutralize the increase in base money arising from purchases of foreign currency. In a number of emerging market economies where the market for government debt is not well developed, the central banks have often created their own debt instruments for this purpose. Through sterilized intervention, countries experiencing surges in capital inflows can maintain the nominal exchange rate while also preventing the capital inflow from increasing the balance of base money.

Sterilized intervention works only if two conditions are met.[18] First, domestic and foreign assets must be imperfect substitutes, such that the exchange of one type of asset for another alters the relative rates of return. Second, the interest cost of the operation must be

[18] In the short run, there is an additional announcement or signaling effect. This cannot be sustained in the longer run, however, unless there is a change in the stance of monetary policy as has been anticipated by the markets.

manageable, as sterilization typically carries quasi-fiscal costs that arise from the exchange of high-yielding domestic debt for low-yielding foreign assets (Calvo, 1991). There is a broad consensus that the first condition does not hold between industrial country assets and therefore the effectiveness of sterilized intervention is limited at best for industrial countries. Between industrial country assets and emerging market assets, however, substitutability may be sufficiently low to allow sterilized intervention to have some effectiveness, though available evidence is mixed at best (Ishii et al., 2006).[19] On the other hand, the interest rate differential rises as substitutability declines, so that greater effectiveness can also mean more limited sustainability.[20]

More broadly, sterilization can be any measure (such as raising reserve requirements; central bank borrowing from commercial banks; and shifting of government deposits from commercial banks to the central bank) that attempts to offset the growth of monetary aggregates coming from reserve inflows. Tightening monetary conditions when there is a genuine demand for credit, however, will create a further incentive to borrow from abroad. If reserve requirements are raised to tighten monetary policy, it may end up raising the cost of financial intermediation and create a distortion in the allocation of resources. In either case, sterilization can be self-defeating by raising the level of interest rates and encouraging further capital inflows, as was observed in several emerging market economies, including Indonesia and Malaysia, in the 1990s (Reinhart and Reinhart, 1998). It is also of limited usefulness in preventing real appreciation over the medium term as inflation eventually picks up (IMF, 2007; Schadler, 2008).

Second, **greater exchange rate flexibility** is another possible response. Here, greater exchange rate flexibility does not mean nominal exchange rate appreciation, the very outcome the authorities are trying to avoid in the first place. Rather, it is meant to introduce two-way risks and thereby discourage speculative capital inflows. This usually involves, in the context of a de facto peg or a tightly managed float, introducing a wider band of fluctuation. The effectiveness of this instrument depends on how much the authorities are willing to allow the exchange rate to move. If the fluctuation band is set narrow, the disincentive for speculative inflows would also be limited. If the band is set large, the potential for large nominal appreciation would also become great. Empirical evidence is inconclusive as to the deterrence effect of greater exchange rate variability on speculative flows (Reinhart and Reinhart, 1998).

Third, **fiscal tightening** is arguably the most assured response to a surge in capital inflows because it involves a reduction in the absorption of real resources by the public sector to offset the domestic impact of resource transfers from abroad. To the extent that it is a real response, it should work to contain inflationary pressure and to prevent a real appreciation of the currency. In addition, fiscal tightening could reduce pressure on interest rates, thus directly reducing incentives for interest rate-induced capital inflows (Schadler, 2008), as well as restrain appreciating pressure by limiting the increase in the relative price of non-tradable goods. Provided that government consumption is more intensive in the use of non-tradable goods, fiscal tightening would cause domestic demand to shift from tradable to non-tradable goods, and domestic production to shift from non-tradable to tradable goods. Indeed, the empirical result reported in IMF (2007) suggests that fiscal tightening has helped limit real exchange rate appreciation in a group of emerging market and advanced economies.

Fiscal tightening, however, has at least three limitations as a response to capital inflows. First, fiscal policy lacks flexibility because it often requires parliamentary action. Second,

[19] Ishii et al. (2006), based on an analysis of daily data, show that intervention had a small but statistically significant impact on the exchange rate level in Mexico, but not in Turkey.

[20] Grenville (2008), however, estimates that the cost of funding the foreign exchange reserves was relatively modest, at around or less than 1 percent of GDP, for major Asian emerging market economies.

there is a limit to how much fiscal policy can be tightened, especially in a democratic society and if there is little fiscal space to begin with. Third, fiscal tightening may have a perverse effect by providing a signal that the authorities are pursuing a sound, disciplined macroeconomic policy. Additional capital inflows could be attracted. It should be countered, however, that such a positive signaling effect is likely transitory; over time, sustainable fiscal policy should help attract only the most stable and committed types of capital (Schadler, 2008).

Structural Measures

Structural or microeconomic measures to deal with surges in capital inflows are many, but three types of measures are the most common: (i) financial sector reform; (ii) easing restrictions on capital outflows; and (iii) further trade liberalization (Schadler et al., 1993; IEO, 2005).

First, **financial sector reform**, including improving the system of prudential supervision and developing capital markets, is not meant to reduce the volume of inflows, but to minimize any negative impact should a crisis occur. If banks are well capitalized and diversified, they are more likely to be resilient to potential capital flow reversals and associated macroeconomic shocks. Having an alternative to bank finance promotes greater risk diversification in the economy (as well as allows the corporate sector to maintain access to corporate financing even when the banking sector is adversely affected). Thus, financial sector reform may help minimize the financial stability risk of capital inflows. This is a long process, however, because a well supervised financial sector or efficient capital markets cannot be produced overnight.

Second, there are two motives for **easing restrictions on capital outflows**. The first is to subject domestic financial markets to greater international competition and to allow residents to diversify their risks; the second is to reduce net capital inflows by encouraging outflows (Schadler et al., 1993). The impact of this measure depends on whether there is a sufficient pent up demand for foreign assets. If not, easing of outflow controls can send a positive signal to markets and, by making it easier to repatriate funds, even lead to additional net capital inflows (Bartolini and Drazen, 1997). This may be what actually happened in Malaysia and Thailand in the previous surge of capital inflows (Reinhart and Reinhart, 1998).

Third, **further trade liberalization** (through tariff reductions and the like) could help contain increases in foreign exchange reserves by encouraging more imports, at least temporarily. Trade liberalization has also been used to increase productivity in the non-tradable sector, so that pressures on the real exchange rate could be eased (Reinhart and Reinhart, 1998). Over time, however, trade reforms may improve export competitiveness by reducing the price of imported inputs and may not contribute much to reducing net imports. Moreover, they may encourage further capital inflows by showing a signal of authorities' commitment to a liberal and open international economic policy regime.

Exploring Policy Options

The existing literature, as well as past experience, suggests that conventional policy options offer no panacea for countries facing large inflows of capital (see the table below for an overview of the discussion). The proper policy response therefore must appropriately weigh various country-specific factors, including the policy objectives, the causes and sustainability of the inflows, and the political and other constraints on the use of instruments. If the cause of the excessive inflow is a domestic distortion (such as a tax benefit for foreign investment), for example, the proper response is to remove that distortion. To enhance the effectiveness of fiscal policy as an instrument of managing capital inflows, governments may find it useful to establish fiscal rules, whereby they for example aim to achieve a cyclically adjusted fiscal

surplus. This will alleviate the procyclicality of fiscal policy that is typical of developing and emerging market economies (Kaminsky et al., 2004) and protect the authorities from the political pressure of increasing spending when the times are good. Such a rule has been successfully adopted in Chile (IMF, 2007; Schadler, 2008).

Over the medium term, effectiveness and feasibility may not be the only consideration because large capital inflows may sooner or later come to a stop. The IMF (2007), based on the experience of a large number of emerging market economies over the past two decades, concludes that the adverse impact on GDP growth of a sudden stop in capital inflows tended to be more moderate when the authorities had used fiscal restraint during the period of large inflows. In contrast, the authorities who resisted nominal appreciation through intervention during the capital inflow period tended subsequently to face more serious adverse macroeconomic consequences when the surge stopped. The difference in outcomes appears to be related to how successfully the authorities could limit the extent of real appreciation. Schadler (2008), noting that fiscal policy has rarely been tightened during surges in capital inflows, calls for greater attention to fiscal policy as an effective tool of inflow management.

Conventional Policy Responses and Implications

	Policy tool	**Intended outcome**	**Possible limitations**	**Empirical evidence on effectiveness**
Macroeconomic measures	Sterilized intervention	To prevent nominal appreciation while neutralizing the growth of base money	Quasi-fiscal cost limits sustainability; higher interest rates attract additional inflows	Limited effectiveness in preventing real appreciation over the medium term, as inflation eventually picks up
	Greater exchange rate flexibility	To discourage speculative capital inflows by introducing two-way risks	Risk of exchange rate appreciation	Limited evidence on the response of speculative flows
	Fiscal tightening	To contain inflationary pressure and prevent real appreciation by curtailing aggregate demand (especially on non-tradables); to discourage capital inflows by reducing interest rate pressure	Lack of flexibility; there is a natural limit to the size of tightening; possibility of a positive signaling effect to attract additional inflows (at least in the short run)	Some evidence of effectiveness in preventing real appreciation; some evidence of better growth performance following a capital flow reversal
Structural measures	Financial sector reform	To minimize the negative impact of a capital flow reversal by promoting better risk management	Process takes time	n.a.
	Easing restrictions on capital outflows	To allow residents to diversify risks; to reduce net inflows by encouraging outflows	There may not be enough pent-up demand for foreign assets; possibility of a positive signaling effect to attract additional inflows	Some evidence of promoting additional capital inflows
	Further trade liberalization	To contain increases in foreign exchange reserves by encouraging more imports; to contain pressure on the real exchange rate by raising productivity in the non-tradable sector	Net imports may not increase if the tradable goods sector becomes more competitive as a result; possibility of a positive signaling effect to attract additional inflows	n.a.

VI. CONCLUSION

How to manage capital inflows remains an important policy issue for many emerging market economies. The issue has assumed even greater importance in recent years as the volume of capital flows picked up against the background of increasing global financial integration. In this environment, even countries without a fully open capital account can no longer consider themselves immune from the risks of capital inflows as they liberalize their trade regime and domestic financial system. Current account convertibility substantially reduces the ability of a control regime to manage capital flows, while financial liberalization increases substitutability among different types of capital account transactions. Once a certain threshold of economic openness and financial market development is reached, a partially open capital account may not effectively protect an economy from the volatility of international capital flows.

The literature provides little practical guidance on capital account liberalization, except to advocate the need for pursuing sound macroeconomic policies and establishing an effective framework of prudential regulation. The difficulty of identifying the precise sequencing of steps comes from the fact that the risks of capital inflows are specific to each transaction and are difficult to measure. Countries with a fully open capital account may resort to the use of temporary capital controls or prudential regulations, but it requires a high degree of administrative capacity to implement them effectively. With respect to the use of conventional macroeconomic measures, the existing literature may provide guidance on good practice, suggesting for example the greater effectiveness of fiscal tightening relative to other measures. Even so, each of the measures, including fiscal tightening, comes with limitations in terms of effectiveness, flexibility, or sustainability.

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