

IMF Policy Discussion Paper

© 1999 International Monetary Fund

This is a *Policy Discussion Paper* (formerly known as *Paper on Policy Analysis and Assessment*) and the author(s) would welcome any comments on the present text. Citations should refer to a *Policy Discussion Paper of the International Monetary Fund*. The views expressed are those of the author(s) and do not necessarily represent those of the Fund.

PDP/99/6

INTERNATIONAL MONETARY FUND

Monetary and Exchange Affairs Department

**A Modernized Approach to Managing the Risks in Cross-Border Capital Movements**

Prepared by R. Barry Johnston and İnci Ötker-Robe<sup>1</sup>

July 1999

**Abstract**

This paper outlines a “modern” approach to managing risks in cross-border capital movements that is consistent with an environment of increased and liberalized capital flows. Key elements of this approach include: a consistent monetary and exchange rate policy mix to avoid incentives for volatile capital flows; prudential management of the specific risks in capital flows; supporting financial sector reforms; and appropriate sequencing of liberalization. The approach can reduce the potential size of the shocks associated with capital movements and increase the resilience of the financial system to such shocks when they occur; overtime, it is expected to reduce the need for recourse to capital controls.

JEL Classification Numbers: E52, F32, G28

Keywords: Cross-border capital movements, prudential risk management, consistency of policy mix, time consistency of exchange rate policy

Author's E-Mail Address: BJohnston@imf.org, IOtker@imf.org

---

<sup>1</sup> The authors are grateful to James Corr, Fernando Delgado, Luca Errico, Sami Geadah, Robert Heath, Haizhou Huang, Scott Roger, and V. Sundararajan for comments on an earlier version of this paper.

## I. INTRODUCTION

Reflecting the trend toward increasing financial integration, external liberalization, and the growth of global financial flows, most emerging market economies are exposed to large international capital movements. Capital controls may provide some temporary protection against volatile capital flows, but to be effective such controls would generally have to be wide-ranging, and even then, the expectation is that the controls would be evaded over time, particularly when there are incentives that exceed the costs of doing so, and would be potentially distortionary to the allocation of financial resources. Countries are, therefore, faced with a core question of how can they achieve the benefits of increased capital flows, but at the same time "protect" themselves from the major risks involved in cross-border capital movements?

This paper outlines the main elements of what we have termed a "modern" approach to managing the risks in cross-border capital movements. By "modern" we mean an approach that is consistent with an international environment of increased capital flows, and one where there is an expectation that capital controls can provide only temporary protection and are likely to be distortionary to the allocation of resources. The approach is designed to reduce the potential size of the shocks associated with capital movements and to increase the resilience of the financial system to such shocks when they occur. It would, therefore, be beneficial to a country to follow this approach whether or not it maintains capital controls; the expectation is that over time it would also reduce the need for countries to make recourse to capital controls.

There are four key elements to this "modern" approach. First, the need to focus on the incentives provided by the monetary and exchange rate policy mix for volatile capital flows (discussed in Section II); second, the identification and prudential management of the specific dimensions of risk involved in cross-border capital flows at the level of the main financial market participants (Section III); third, the need for supporting financial sector reforms (Section IV); and fourth, the appropriate sequencing of liberalization of the capital account (Section V). Section VI

demonstrates an application of this approach to two emerging market economies, and Section VII provides concluding remarks.

## **II. INCENTIVE STRUCTURES CREATED BY THE MONETARY AND EXCHANGE RATE POLICY MIX**

Capital flows, particularly shorter-term flows, are highly sensitive to the incentives created by interest rate and exchange rate policies. Experience from a number of countries has suggested that consistency in the monetary and exchange rate policy mix goes some way to explaining countries' vulnerability to volatile capital flows whether or not they imposed capital controls.<sup>2</sup> Consistency refers both to the relationship between interest rates and exchange rate policies at a point in time, and the sustainability of these policies over time. Thus, countries that followed consistent monetary and exchange rate policy mixes by, for example, directing interest rates to achieve a domestic nominal target while allowing their exchange rates to adjust, appear to have avoided severe capital flow reversals. Countries that followed inconsistent policy mixes by, for example, following exchange rate targets while directing interest rates to domestic stabilization objectives, created incentives for short-term flows and were more exposed to capital flow reversals. In several cases, countries introduced capital controls in an effort to reconcile their inconsistent policy mixes. However, where the countries did not take more fundamental policy action to adjust their monetary and exchange rate policies, the controls appear to have been only partially effective in reducing the overall volume of capital inflows and outflows. These countries were, therefore, at risk to a reversal of capital flows when the sustainability of their policy mix came into question.

---

<sup>2</sup> See Johnston and others (1999b). Fiscal policy also has a role in contributing to a consistent policy mix. Expansionary fiscal policies may undermine the credibility of a pegged or tightly managed exchange rate policy by creating expectations of relaxation of monetary policy, and may result in capital outflows. Loose fiscal policy may also excessively burden monetary policy in the context of a stable exchange rate policy, and the required increase in interest rates may create incentives for capital inflows.

Two elements of monetary and exchange rate policy consistency are relevant: (1) consistency or compatibility at a point in time, and (2) consistency over time.

(1) **Consistency or compatibility at a point in time** can be best demonstrated by the covered interest parity theorem, an arbitrage condition that states that ex-ante risk-adjusted rates of return on assets that are perfect substitutes are equalized across countries:

$$i = i^* + f_d$$

where,  $i$  and  $i^*$  are the rates of return on domestic and foreign assets of the same maturity, respectively, and  $f_d$  is the forward discount on the domestic currency for that maturity;

$f_d = [(e^f - e^s) / e^s] \times 100$ , where  $e^f$  and  $e^s$  are forward and spot exchange rates, respectively, of the domestic currency vis-à-vis the foreign currency. The covered interest parity implies that where foreign interest rate and forward exchange rates are predetermined, a country could determine the domestic interest rate or the spot exchange rate, but not both. Where covered interest rate parity holds, the interest rate and the exchange rate are not independent of one another and cannot be considered as separate instruments.

With greater freedom of capital movements, short-term interest rates in domestic markets will increasingly be determined by the covered interest parity condition.<sup>3</sup> An attempt to set both interest rates and exchange rates, inconsistent with this condition—that is independently of one another—is likely to lead to short-term capital flows as markets respond to the incentives created to switch investments between currencies. The capacity to assign monetary and exchange rate policies to achieve different (and potentially conflicting) macroeconomic targets would therefore be increasingly

---

<sup>3</sup> The covered interest rate parity condition holds in the international, offshore currency market. However, capital controls generally may prevent arbitrage between the domestic and offshore markets. The greater freedom of capital flows has reduced or eliminated the segmentation between the domestic and offshore markets, thus bringing domestic interest rates into line with the covered interest rate parity condition.

constrained with the opening of the capital account. For example, if monetary (or interest rate) policy targets inflation, it would not be possible to use the exchange rate to safeguard international competitiveness; conversely, if the exchange rate is targeted to achieve external competitiveness objectives or is fixed, monetary policy would have little autonomy to achieve domestic stabilization objectives or to manage the consequences of short-term capital inflows. Therefore, under greater capital mobility, a consistent monetary and exchange rate policy mix would entail either: (1) a flexible interest rate (or monetary) policy devoted to support the exchange rate, if the exchange rate is pegged or tightly managed; or (2) greater exchange rate flexibility, where interest rates are directed to achieving domestic monetary objectives.

(2) The second dimension of policy consistency is **consistency over time** of a given exchange rate-monetary policy mix, which in turn determines the sustainability of the chosen policy mix. An economic policy is said to be “time inconsistent” when a future policy decision that forms part of an optimal plan formulated at some initial date is no longer optimal when considered at some later date.<sup>4</sup> For example, a pegged or managed exchange rate may become “time inconsistent” when the decision to maintain the level of the exchange rate in a future period is no longer optimal under the prevailing conditions. An exchange rate target intended to support the real sector might, for example, be abandoned when the interest rates needed to defend the exchange rate become excessively costly to the corporate sector. Understanding that policymakers may be inconsistent over time, private decision-makers with rational expectations are led to distrust policy announcements and

---

<sup>4</sup>See, for example Kydland and Prescott (1977) Time inconsistency arises from the fact that in some situations policymakers may want to announce in advance the policy they will follow in order to influence the expectations of private decision makers. But after the private decision-makers have acted on the basis of these expectations, the policymakers may be tempted to renege on their announcement. Time inconsistency of policy may arise in many different contexts, including in the conduct of monetary policy, tax policy, and government debt policy, as well as in public policy context, e.g., in government policy about negotiating with terrorists over the release of hostages (see Turnovsky (1995)).

behave accordingly. That is, rational agents, understanding the incentive for the policymaker to renege, would not find the exchange rate peg credible and attack the currency whenever there are signs that the peg has become inconsistent with the prevailing economic and market conditions. Since the potential size of these attacks is likely to be considerably larger in an environment of large capital movements and where agents can "short" the currency through various forward transactions, an attempt by the authorities to defend the peg, through an interest rate defense or foreign exchange market intervention, may not be effective where there are fundamental concerns about the underlying time consistency of the policy (e.g. Spain's experience in 1992 ERM crisis or the experience of Thailand during the recent Asian Crisis).

Establishing credibility in the sustainability ("time consistency") of the monetary and exchange rate policy in the context of increased capital movements may require that countries have either very strong commitments to a pegged exchange rate or adopt a flexible exchange rate. In order to have a credible monetary and exchange rate policy mix, the policymaker should either have his discretionary power taken away, for example, by making a very firm commitment to a fixed exchange rate policy through, for example, legal and technical arrangements that limit central bank monetary financing (such as in a currency board), or else adopt a flexible exchange rate regime at the outset. Country experiences seem to support the view that with a greater degree of capital mobility, more extreme exchange rate regimes become more viable, and there has been a tendency by Fund members to move toward more extreme exchange systems as they have liberalized their capital accounts.<sup>5</sup> As few countries have been able to make the required policy commitment for a credible exchange rate peg, many emerging market countries that have opened their capital accounts have adopted greater exchange rate flexibility. Some of these countries introduced greater flexibility in a progressive and pragmatic fashion, for example by progressively widening currency bands as part of a strategy for

---

<sup>5</sup>See Eichengreen and Masson (1998), Fischer (1996), and Johnston and others (1999a).

exiting from more rigid forms of pegged exchange rates, but have also generally found it necessary to move toward more flexible arrangements as capital account liberalization has progressed.<sup>6</sup>

### III. MANAGING THE SPECIFIC DIMENSIONS OF RISK IN CROSS-BORDER FLOWS

Cross-border capital flows typically involve additional dimensions of risk from those that are found in purely domestic transactions. Box 1 provides a description of such risks. To cope with the risks involved in cross-border capital flows, countries—both debtors and creditors—need to adopt and implement appropriate prudential regulations. Implementation of such prudential approaches is relevant for the management of risk by private institutions, as well as the monetary authority's management of its own foreign currency risks and exposures.

#### A. Management of Risk by Private Institutions

*Best practice prudential regulations recognize that cross-border capital movements may involve specific elements of risks* that may differ from those risks in purely domestic transactions and thus require additional rules and regulations to handle these risks. Best practice prudential regulations generally seek to manage these specific risks by limiting an institution's risk exposure to the extent of its ability to handle such risks and by enhanced monitoring through appropriate disclosure and reporting requirements, rather than by restricting capital movements. Such regulations include establishing appropriate prudential limits, in the form of certain balance sheet ratios, against excessive taking of risks involved in cross-border capital movements; incorporating such risks in the loan classification, provisioning, capital adequacy, disclosure and reporting requirements for the banking institutions; and oversight of the institution's capacity to assess and manage its own risk exposures. Examples of specific cross-border capital transactions and the risks involved in such transactions and

---

<sup>6</sup>See Johnston, and others (1999a).

### Box 1. Various Types of Risk Involved in Cross-border Transactions of Banks

The opening of the capital account and cross-border activities of banks introduce specific risks which may increase the magnitude, or complicate the management, of those types of risks that banks more typically face in their domestic activities. The key risks in the context of an open capital account and how to cope with these risks are discussed below (see also Folkerts-Landau and Lindgren (1998)).

1. **Credit risk:** the failure of a counter party to perform according to a contractual arrangement. It applies not only to loans but also to other on- and off-balance sheet exposures such as guarantees, acceptances and security investments. Additional dimensions of credit risk in the context of cross-border transactions include:
  - **Transfer risk:** when the currency of obligation become unavailable to the borrower regardless of its financial condition
  - **Settlement risk:** risk in the settlement of some foreign exchange operations that is due to time zone differences, Existence of different currencies, or different settlement systems
  - **Country risk:** risk associated with the economic, social, and political environment of the borrower's country.
2. **Market risk:** risk of losses in banks' on/off-balance sheet positions arising from movements in market prices that change the market value of an asset or a commitment. This type of risk is inherent in banks' holdings of trading portfolio securities, financial derivatives, open foreign exchange positions and in interest sensitive bank assets and liabilities. There should be well-structured quantitative and qualitative standards for risk management for such risk.
  - **Foreign exchange risk:** refers to the risk of losses in on- or off-balance sheet positions arising from adverse movements in exchange rates. It tends to be most closely identified with cross-border capital flows. Banks are exposed to this risk in acting as market makers in foreign exchange by quoting rates to their customers and by taking unhedged open positions in foreign currencies.
  - **Interest rate risk:** refers to the exposure of a bank's financial condition to adverse movements in interest rates, arises as a result of a mismatch (gap) between a bank's interest sensitive assets and liabilities, and affects both the earnings of a bank and the economic value of its assets, liabilities and off-balance sheet instruments. Excessive interest rate risk may erode a bank's earnings and capital base. The primary forms of interest rate risk are:
  - **Repricing risk:** arises from timing differences in the maturity and repricing of bank assets, liabilities, and off-balance sheet positions;
  - **Yield curve risk:** arises from changes in the slope and shape of the yield curve;
  - **Basis risk:** arises from imperfect correlation in the adjustment of the rates earned and paid on different instruments with otherwise similar repricing characteristics;
  - **Optionality risk:** arises from the express or implied options imbedded in many bank assets, liabilities and off-balance sheet portfolios.
  - **Risk in derivative transactions:** Derivatives are an increasingly common method of taking or hedging risks. The actual cost of replacing a derivative contract at current market prices is one measure of exposure to market risk. Since many of these transactions are registered off-balance sheet, supervisors need to ensure that banks active in these transactions are adequately measuring, recognizing, and managing the risks involved.
3. **Liquidity risk:** arises from the inability of a bank to accommodate decreases in its liabilities or to fund an increase in its assets at a reasonable cost. Inadequate liquidity, then, affects profitability and, in extreme cases, can lead to insolvency. There are no internationally agreed prudential standards on bank liquidity, but supervisors require banks to have adequate systems to monitor and control their liquidity needs and establish contingency plans for periods of liquidity stress. Regulation of liquidity risk focuses on the degree of mismatch between maturities of assets and liabilities and dependability of access to funds in future periods.



some of the prudential techniques that could be used to manage these risks are examined in Appendix Table 1.

*Against the background of increased globalization and capital mobility, prudential standards and procedures are being updated to reflect, inter alia, the risks in cross-border capital flows. More specifically:*

- The Basle Committee has recently issued proposals to update the capital adequacy framework that recommend that the risk weightings on cross-border lending to sovereign borrowers that would be applied in assessing the capital standards would be based on the credit assessments made by external rating agencies. The procedures for weighting the claims on banks would also be amended. Under the existing procedures, all claims on banks in the OECD countries and short-term claims (i.e., up to one year) on banks incorporated in non-OECD countries have received a 20 percent risk weight, and this risk weight has been criticized on the grounds that it may have biased the credit flows to emerging markets toward shorter-term maturities. The new proposals would either apply a weight to banks that is one category less favorable than that applied to the sovereign borrower in which the bank is incorporated, or directly apply the rating assigned by an external credit rating agency; no distinction, however, has been proposed as regards the maturity of the claims.<sup>7</sup>
- Consideration is also being given to the need for prudential oversight of highly leveraged institutions partly in response to concerns that these institutions have contributed to the volatility of capital flows to emerging markets.

---

<sup>7</sup> See Basel Committee on Banking Supervision (1999).

- In view of the increasing complexity of financial instruments, and the growth of derivative products, the procedures for measuring, managing and controlling risks are being updated using, for example, “value-at-risk” models in the internal management and prudential oversight of financial institutions.
- Finally, increasing cross border capital movements have also increased the need for international cooperation to combat money laundering, and the Financial Action Task Force for Money Laundering (FATF) has been stepping up its efforts in this area.

*Capital controls are sometimes used in pursuit of prudential goals*, particularly in the context of underdeveloped regulatory frameworks. An example of a capital control that serves a prudential purpose is restrictions on the issue of securities by nonresidents in the local financial markets because of the problems of enforcing regulations in different national jurisdictions due to inadequate international cooperation. Capital controls have also been applied to limit foreign borrowing where local financial institutions have lacked the capacity to engage in cross-border transactions on a commercially sound basis, due, for example, to weak internal risk controls or insolvency. Capital controls have been used to seek to bias the composition of capital inflows toward longer-term capital flows with the objective of reducing the impact of volatility and risks involved in such flows on bank balance sheets. They have also been used to limit excessive unhedged external borrowing due to an inadequate assessment of foreign exchange risks in the context of a heavily managed exchange rate arrangement, as excessive unhedged borrowing in foreign currencies can exacerbate banking problems when devaluation occurs.

*Reliance on capital controls tends to be replaced with best practice prudential measures as countries develop their regulatory frameworks and implementation capacities.* There are two main reasons for this. First, capital controls are not well designed to address the principal types of risks involved in cross-border transactions. They do not address, for example, the currency, interest rates

and credit risks involved in cross border transactions. In most cases, controls, especially when they are extensive and restrictive, mainly attempt to eliminate the risk by eliminating or limiting the flows, rather than addressing these risks, thereby also eliminating the potential benefits from such flows. Second, capital controls are prone to circumvention and such circumvention can increase risks to the financial system by directing flows through channels that are less well regulated, such as, for instance, offshore financial centers,<sup>8</sup> and as such, can distort the efficient allocation of financial resources.

### **B. Management of Currency Risks by the Central Bank**

One of the key lessons that has come out of the Asian crisis is that countries need to pay particular attention to the management of their own foreign exchange assets and liabilities—their foreign exchange reserve positions—to reduce vulnerability to potentially volatile capital flows and associated movements in exchange rates. Some of the lessons form a prudential approach to managing the risks in cross-border capital flows also apply to central banks in the management of their own foreign exchange reserve positions. Specifically, these include the importance of:

- measuring accurately foreign currency exposures, including off-balance sheet activities such as intervention in the forward exchange markets;
- monitoring the foreign currency liquidity position in a comprehensive manner, including derivative transactions such as call and put options on foreign currency liabilities and assets;
- managing market access to liquidity through diversified funding sources; and

---

<sup>8</sup> See Errico and Musalem (1999).

- contingency planning for crisis situations, for example by negotiating contingent lines of credit with predetermined interest costs that can be drawn down in a crisis.

Such approaches are increasingly being incorporated into national and international approaches for monitoring and assessing official foreign exchange reserve adequacy. The importance of disseminating more comprehensive information on foreign exchange reserve positions has also been emphasized.

#### **IV. SUPPORTING FINANCIAL SECTOR REFORMS**

In addition to adopting and implementing best practice prudential regulations to manage the specific dimensions of risk involved in cross-border transactions, a successful functioning of financial markets in the context of an open capital account would call for the implementation of a comprehensive set of financial sector reforms, including: (i) promoting a sound and healthy banking system, particularly where banks play a predominant role in financial intermediation; (ii) strengthening audit, accounting and the supervisory regulatory system; and (iii) deepening of the financial markets and instruments to facilitate efficient resource allocation, risk management, and effective monetary and exchange rate management.<sup>9</sup>

##### **A. Existence of a Healthy and Sound Banking System**

Increasing cross-border capital flows will accelerate the need to restructure weak banking systems. Where capital flows are channeled mainly through the banks, the strength of the banking system would determine the efficiency of the use of capital flows and thus the sustainability of the capital inflows. Where capital flows are intermediated outside the banking system, they will tend to increase competitive pressure on the domestic banking system and thus the need to restructure the

---

<sup>9</sup> See Johnston and Sundararajan (1999).

banking system. While selective capital controls may be necessary to prevent external borrowing by weak or insolvent banks, this will not necessarily reduce the vulnerability of the financial system to capital flows when the banking system is weak, in view of the influence that the banks' interest rate and credit policies would have on other agents' decisions to borrow or lend internationally and the fungibility of capital. Wide bank deposit/lending spreads may lead to excessive external borrowing, or high interest rates associated with weak but implicitly guaranteed banks may result in borrowing for the purpose of depositing in the banking system. Measures to restructure weak banks through merger, closure, or liquidation of insolvent and nonviable banks and recapitalization of viable banks and to strengthen bank management would, therefore, generally have to be accelerated as countries become more exposed to international capital movements.

#### **B. Strengthening of Accounting, Auditing, Disclosure, and Supervisory Frameworks**

The existence of an adequate set of prudential regulations to manage various types of risks involved in domestic or international transactions would not serve their intended purpose of increasing the resilience of financial institutions to cope with various financial risks, unless a strong and effective supervisory system and appropriate accounting and auditing frameworks and disclosure standards consistent with international best practices are in place. This is because prudential regulations that rely on limits may also be prone to circumvention like capital controls, but the extent of circumvention is expected to be smaller where there is disclosure of information.<sup>10</sup> Appropriate

---

<sup>10</sup>This is because with the disclosure of information financial institutions have direct incentives to comply with prudential regulations, since doing so could potentially reduce their funding costs and the required return on capital; in contrast, compliance with capital controls carries no such advantage, except for the avoidance of the perceived cost of noncompliance. Circumvention of prudential regulations may also be limited for such measures are intended to address the overall risk exposure of financial institutions, an objective that should also be shared by shareholders and management of the financial institutions. Capital controls, on the other hand, focus on controlling individual transactions without an overall objective for risk position of the institutions and, as such, may be more prone to circumvention.

accounting and disclosure standards and adequate supervisory systems play a crucial role in enabling the supervisory authorities and the market to adequately measure the overall financial condition of the banking institutions and their risk exposure (incorporating their cross-border activities, such as offshore and off-balance sheet activities). Similarly, the dissemination of economic and financial data contributes to healthy market assessments of economic and macroeconomic performance. Strong supervisory framework and adequate reporting and information systems are crucial in ensuring banks' compliance with the existing prudential regulations. Country experiences suggest that where banking sector reforms, including strengthening the prudential and regulatory framework and supervision, lagged the liberalization of the capital account, higher capital mobility increased the exposure of the financial institutions to the risks involved in cross-border capital transactions and the vulnerabilities contributed to banking and currency crises (e.g., as in Thailand, Indonesia, Korea).

### **C. Deepening of Financial Markets and Instruments**

The existence of *deep and liquid financial markets* (interbank money, spot and forward foreign exchange, and securities markets) are essential in facilitating an efficient allocation of financial resources under an open capital account, as well as in promoting risk management by allowing market participants to hedge themselves against various types of risk involved in domestic and international capital transactions. In particular, liquid spot and forward foreign exchange markets and adequate *hedging instruments* would enable banks and nonbank institutions to price and hedge foreign exchange risk; liquid money markets would help manage liquidity and interest rate risks; and developed securities markets would help price maturity transformation and credit risks, and facilitate corporate sector access to financial resources, and thus reduce the burden on banking institutions as the principal channel for intermediation of financial resources. The development of such markets would require flexibility of prices—interest rates and exchange rates—and implementation of

appropriate market infrastructure, including payments and settlement systems, codes of conduct, and technical infrastructure.

Finally, moving away from direct *instruments of monetary control* toward a more market based approach is a significant component of financial sector reform in managing capital flows under greater capital mobility. Lack of adequate indirect instruments of monetary policy (such as market-based monetary operations and central bank liquidity facilities at market interest rates) would constrain the ability of the authorities to manage capital inflows and thus greatly complicate the implementation of monetary policy (e.g. as in Thailand in the mid-1990s).

## **V. Issues in Sequencing Capital Account Liberalization**

Sequencing of the capital account liberalization and the supporting reforms are not “all or nothing affairs,” and in an orderly liberalization certain components of the capital account can be liberalized before all the supporting reforms are in place and may help support the reform and economic objectives.<sup>11</sup> A modern approach to managing the risks of cross-border capital flows recognizes that there are pitfalls from inappropriate sequencing of liberalization, but also that once a country has begun to liberalize its capital account, the degree of protection that a residual regime of capital controls can provide against volatile capital flows may be relatively limited, and hence it emphasizes the need to accelerate the supporting structural and institutional reforms and the adoption of consistent macroeconomic policies.

Concerns about inappropriate sequencing are most often directed toward the premature *liberalization of short-term capital flows*. In liberalizing short-term flows:

---

<sup>11</sup>See Johnston (1998) for a discussion of sequencing capital account liberalization.

- A bias in liberalization toward promoting short-term flows combined with inconsistent monetary and exchange rate policies—unsustainable, or insufficiently supported, *explicit or implicit exchange rate guarantees*—must be avoided, in view of the risks that this would create for volatile capital flows. Nevertheless, it is not practical to conclude that all short-term flows should be restricted, since short-term trade credits are an essential element of international trade finance and international interbank transactions of efficient foreign exchange markets. However, even very selective liberalization of short-term flows can become problematic when combined with “distorted incentives” that are large (e.g., high domestic interest rates and exchange rate guarantees), limited attention to the risks (exchange rate, interest rate, and liquidity) of such transactions, and inadequate enforcement of prudential regulations.
- Broader liberalization of short-term capital inflows (such as into money market instruments, bank deposits, and derivatives) should be approached with an explicit understanding that such liberalization will impose important *constraints on exchange rate regimes*: as discussed above, countries liberalizing short-term capital flows should either have a very strong commitment to a fixed exchange rate (and thus subordinating monetary policy to this objective) or a flexible exchange rate regime, alongside a recognition that those constraints may not be removed by the simple expedient of retaining controls on short-term inflows, if longer-term inflows, as well as current transactions, are substantially liberalized.
- A *flexible exchange rate regime may have some role* to play. Recognition of greater exchange rate uncertainty that could be involved in a flexible exchange rate regime may discourage the kind of capital inflows that are short-term and volatile in nature and that can be easily reversed.



Greater exchange rate flexibility would also encourage more prudent risk management by reducing the implicit exchange rate guarantees provided by pegged exchange rate regimes. This would not only discourage banks and nonbank institutions from taking excessive unhedged foreign exchange positions as short-term capital transactions are liberalized, but would also have the beneficial impact of stimulating foreign exchange market development as market participants seek to hedge the potentially greater exchange rate risks they face under greater exchange rate flexibility. It would be important in this connection that *concurrent reforms are implemented to liberalize the foreign exchange system* to facilitate such hedging activities.

A well-designed program of capital account liberalization should reflect the stage of financial sector development and the synergies between domestic and external liberalizations. Where financial systems are weak, earlier capital account liberalizations could focus on measures to help strengthen financial systems—for example, by attracting foreign capital to restructure weak financial institutions by focusing on liberalizing flows that are less dependent on supporting institutions such as direct investments and flows intermediated by international capital markets, and by focusing on liberalizations that would help develop the domestic money, foreign exchange, and capital markets. Conversely, certain liberalizations would be delayed—such as allowing insolvent banks access to borrowing abroad—until the necessary restructuring and risk management systems are prepared and implemented. The emphasis should be on a comprehensive and a well-coordinated program of financial sector reform.

## **VI. AN APPLICATION OF THE APPROACH TO SELECTED EMERGING MARKET ECONOMIES**

The main elements of this “modern” approach to managing risks in cross-border capital movements discussed above can be summarized as:

- **An internally consistent monetary and exchange rate policy framework**, that is sustainable over time, to help minimize incentives for volatile short-term capital inflows;
- **Identification and prudential management of the additional dimensions of risks** involved in cross-border flows; such prudential regulations are expected to increase the resilience of the financial system to adverse shocks in capital movements, and to replace capital controls as countries develop their regulatory frameworks, markets, and implementation capacities;
- The need for **supporting financial reforms**, including efforts to ensure the existence of a healthy and sound banking system; strengthening of accounting, auditing, disclosure, and supervisory frameworks to adequately measure the risk exposure of banking institutions and ensure market discipline and compliance with the best practice prudential regulations; and accelerating development of financial instruments and markets to facilitate efficient allocation of financial resources and risk management by market participants; and
- **An appropriate sequencing of liberalization** of the capital account accompanied by concurrent and supporting reforms and policies, to avoid biasing the liberalization toward more unstable flows.

A demonstration of this approach for two selected emerging market economies, Malaysia and Poland, is provided in Appendix Table 2. Both countries have made significant progress in strengthening their prudential regulations and supervisory systems as they faced larger capital inflows and outflows in recent years. Both countries have been relatively open to capital flows until recently; however, Malaysia resorted to temporary controls on capital outflows in September 1998 in the context of its efforts to cope with the speculative pressures on its currency during the Asian financial crisis. The imposition of controls reflected the authorities' concerns about the implications of the interest rate policy that would be necessary to stabilize the foreign exchange markets in the

context of their efforts to restructure the banking system and revive the domestic economy. The experience of Malaysia serves to demonstrate the importance of following a comprehensive approach as outlined above, since the absence of even one element in an otherwise well-managed economy could expose the economy to potential vulnerabilities in the face of large capital movements.

## **VII. CONCLUDING REMARKS**

This paper outlines the main elements of a modern approach to managing risks in capital movements, an approach that is consistent with an environment of increased financial integration and substantial growth in capital flows. Key elements of this approach include: consistency of monetary and exchange policy mix to avoid incentives for volatile capital flows; prudential management of the specific risks in capital flows; supporting financial sector reforms; and appropriate sequencing of liberalization.

This approach is designed to reduce the potential size of the shocks associated with capital movements, as well as to increase the resilience of the financial system to such shocks when they occur. Such an approach is beneficial to a country whether or not it maintains capital controls, but the expectation is that full implementation of such a framework would over time reduce the need for countries to make recourse to capital controls. Countries are, therefore, encouraged to maintain economic policy mixes that are consistent internally, as well as over time, and to accelerate the strengthening of their prudential frameworks and the supporting structural and institutional financial sector reforms. All these elements are likely to be necessary to reduce vulnerabilities to large capital flows.

## References

- Basel Committee on Banking Supervision, "A New Capital Adequacy Framework," Consultative Paper, Bank for International Settlements, June 1999
- Eichengreen, B. and P. Masson, "Exit Strategies: Policy Options for Countries Seeking Greater Exchange Rate Flexibility," *IMF Occasional Paper* 168, with a staff team consisting of H. Bredencamp, B. Johnston, J. Hamann, E. Jadresic, and I. Otker (1998).
- Errico, L. and A. Musalem, Offshore Banking: An Analysis of Micro and Macro-Prudential Issue," IMF Working Paper, WP/99/5 (January 1999).
- Fischer, S. "Maintaining Price Stability," *Finance and Development* (December 1996).
- Folkerts-Landau, D. and C. Lindgren, "Toward a Framework for Financial Stability," *IMF World Economic and Financial Surveys* (January 1998).
- Johnston, B., "Sequencing Capital Account Liberalization and Financial Sector Reform," *IMF Paper on Policy Analysis and Assessment*, PPAA/98/8 (July 1998).
- Johnston, B. and others, Exchange Rate Arrangements and Currency Convertibility: Developments and Issues, *IMF World Economic and Financial Survey*, 1999a, forthcoming.
- Johnston, B. and others, Countries Experiences with the Use of Capital Controls and Issues in their Orderly Liberalization, IMF, 1999b.
- Johnston, B. and V. Sundararajan, *Sequencing Financial Sector Reforms: Country Experiences and Issues*, International Monetary Fund, Washington, D.C., 1999.
- Kydland, F. and E. Prescott, "Rules Rather Than Discretion: The Inconsistency of Optimal Plans," *Journal of Political Economy* 85 (June 1977), pp. 473-492.
- Turnovsky, S. J., *Methods of Macroeconomic Dynamics*, MIT Press, 1995.

Table 1. Various Types of Risks Involved in Cross-Border Capital Movements and Prudential Measures to Manage Such Risks

Type of risk involved in cross-border capital movements	Type of capital transactions subject to such risks	How to manage such risks
<b>Credit risk</b>  (including transfer, settlement, country risks)	Examples include: <ul style="list-style-type: none"> <li>• Bank lending to residents and nonresidents in foreign currency</li> <li>• Bank involvement in derivative activities in foreign exchange (swaps, options, forwards, etc) with residents and nonresidents (including offshore counterparts)</li> <li>• Bank involvement in other off-balance sheet activities involving contingent liabilities or assets in foreign exchange (e.g., guarantees, acceptances, and security investments).</li> </ul>	<ul style="list-style-type: none"> <li>• Proper recognition, analysis, monitoring, and limiting credit risk for domestic as well as cross-border exposures: <ul style="list-style-type: none"> <li>• Limits against large exposures to a single borrower or a group of related borrowers and against connected lending;</li> <li>• Limits against credit concentration in particular industries, sectors, or regions; exposure limits for foreign currency loans;</li> <li>• Application of risk weights to banks' capital requirements that specifically reflect elements of cross-border risk and imposition of higher capital adequacy requirements for banks with large international business;</li> <li>• Incorporation of various elements of cross border risk (e.g., in foreign currency loans, offshore, derivatives, or other off-balance sheet activities) in loan classification and provisioning requirements;</li> <li>• careful monitoring of banks' foreign currency denominated or indexed loans to domestic customers that do not have adequate sources of foreign exchange or otherwise unable to the hedge the risks involved, and consolidated balance sheets and effective consolidated supervision;</li> <li>• frequent disclosure requirements for banks' cross-border activities.</li> </ul> </li> </ul>
<b>Market risk</b>		
Foreign exchange risk	Examples include: <ul style="list-style-type: none"> <li>• Banks' market making in spot and forward exchange markets</li> <li>• Banks' taking unhedged open positions in foreign currencies, e.g., through: <ul style="list-style-type: none"> <li>• Bank borrowing from abroad</li> <li>• Banks' foreign currency loans to residents or nonresidents</li> <li>• Banks' derivative activities in foreign currencies</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Establish internal limits and monitoring mechanisms for foreign exchange exposure: <ul style="list-style-type: none"> <li>• net open foreign exchange position limits in specific currencies, including sublimits in spot positions and various forward maturities when derivative instruments are used, as well as on overall positions;</li> <li>• specific capital requirements against foreign exchange risk;</li> <li>• adequate monitoring through disclosure of banks' open positions in foreign currency and maturity profile of the outstanding exchange contracts;</li> <li>• Ensure existence of instruments and markets for hedging foreign exchange risk;</li> <li>• Maintain a consistent exchange rate and monetary policy mix that avoids explicit or implicit exchange rate guarantees to limit banks' and other individuals' tendency to misprice foreign exchange risk.</li> </ul> </li> </ul>

Type of risk involved in cross-border capital movements	Type of capital transactions subject to such risks	How to manage such risks
Interest rate risk	<ul style="list-style-type: none"> <li>• Banks' holding of interest sensitive domestic and foreign assets and liabilities, including off-balance sheet items</li> </ul>	<ul style="list-style-type: none"> <li>• Enhanced monitoring and reporting requirements on the:               <ul style="list-style-type: none"> <li>• maturity structure of interest sensitive assets and liabilities, broken down into several daily, weekly, monthly, and quarterly maturity "buckets" including the hedging instruments if off-balance sheet items are used to hedge the interest rate gap;</li> <li>• maturity structure for each currency in which the bank has a substantive position since interest rate risk can be assumed in currencies other than the domestic currency; and</li> <li>• the types of interest bearing securities and their maturity breakdown;</li> </ul> </li> <li>• Active management of maturity mismatches between bank assets and liabilities, with limits established against such gaps and limits on various instrument exposures incurred by the bank;</li> <li>• Sensitivity analyses of bank balance sheets and off-balance sheet positions under alternative scenarios for interest rate changes.</li> </ul>
Risk in derivative Transactions	<ul style="list-style-type: none"> <li>• Interest and foreign exchange rate derivative transactions (swap, options, forward, futures, etc) of residents with other residents and nonresidents</li> </ul>	<ul style="list-style-type: none"> <li>• Establishment of risk-management guidelines, internal control mechanisms for adequate measurement and management of risks involved in derivative activities;</li> <li>• Incorporation of exposure to such transactions into the loan classification and provisioning requirements;</li> <li>• Bringing accounting rules in line with international standards to accurately measure the volumes and risks involved in such transactions;</li> <li>• Frequent disclosure requirements for such activities, in particular on notional principal (the principal amount on which various payments associated with the derivatives are based) and actual cost of replacing the derivative contract at current market prices.;</li> <li>• Validation and monitoring compliance with banks' internal risk models and control systems and maximum exposure limits.</li> </ul>
Liquidity risk	<ul style="list-style-type: none"> <li>• Banks lending to residents and nonresidents in domestic and foreign currencies;</li> <li>• Banks' borrowing from abroad</li> </ul>	<ul style="list-style-type: none"> <li>• Establishing limits against maturity mismatches in a prudentially based liquidity framework based on a maturity ladder;</li> <li>• Separating management of liquidity risk within each currency component of a bank's balance sheet and including off-balance sheet operations in these limits;</li> <li>• Access to diversified funding bases in terms of sources of funds and the maturity breakdown of the liabilities, taking into account differences in volatility and reliability of domestic and external sources of liquidity;</li> <li>• Information disclosure by banks on their liquid assets, expected future cash flows and liquidity gaps for specified future periods, and details of the liquidity management method, and by the central bank on market liquidity situation;</li> <li>• When prudentially based liquidity framework is not in place, maintain adequate level of liquid assets through, e.g., appropriate liquid asset and/or reserve requirements.</li> </ul>

Table 2. Management of Risks Involved in Cross Border Capital Flows in Selected Countries

Managing risks in cross border flows	Malaysia	Poland
<b>Prevailing capital control regime</b>	<p>The capital account was liberalized in 1986-87 and 1994-96, but liberalization was interrupted in early 1994 with temporary inflow controls on portfolio transactions, and in September 1998-99 when exchange controls were imposed to eliminate the offshore trading in ringgit and stabilize the impact of volatile capital flows.</p> <ul style="list-style-type: none"> <li>Prevailing controls apply to internationalization of the ringgit and portfolio investments, exempting FDI and current account transactions, restricts repatriation of nonresidents' portfolio capital (price-based control since February 1999), and imposes tight limits to transfers of capital abroad by residents.</li> <li>Borrowing abroad and lending in FX by banks are restricted only by open position limits; limits and approval requirements apply to borrowing by residents.</li> </ul>	<p>Capital account transactions have been liberalized gradually since 1991, accelerated since 1996. All controls on capital movements will be removed by end-1999.</p> <ul style="list-style-type: none"> <li>In early 1999, restrictions on zloty convertibility were eliminated; all transactions are allowed unless specifically restricted.</li> <li>Controls exist on certain underlying capital transactions that are short term in nature (inflow and outflow of investments in capital, money market and debt securities with maturity less than 1 year, granting/receiving financial credits with maturities less than 1 year, and derivative transactions).</li> <li>The law contains emergency measures that can be imposed for about 6 months in the event of a serious risk to stability and integrity of the financial system or an increase in money supply.</li> </ul>
<b>Key elements of managing risks in cross border flows in the "modernized" approach</b>		
<b>A. Consistency of Monetary-Exchange rate policy mix</b>	<p>The prevailing exchange rate regime is a fixed exchange rate peg against the U.S. dollar, maintained along with some rigidities interest rate policy, which could potentially lead to incentives for short-term capital flows under a more liberal capital account regime.</p>	<ul style="list-style-type: none"> <li>The exchange rate has played the role of a nominal anchor, as well as responding to developments in competitiveness, and as such, periodic tensions on monetary and exchange rate policy occurred.</li> <li>These tensions were handled by stepwise devaluation and/or by progressive increase in the flexibility of exchange rate arrangement to a preannounced crawling peg, while maintaining the anchor role of the exchange rate.</li> <li>Exchange rate flexibility increased further with wider bands in response to persistent capital inflows. In 1998, inflation targeting was adopted, with a further widening of the band to increase the flexibility of the regime and limit potential tensions from pursuit of multiple anchors under greater capital mobility.</li> </ul>
<b>B. Banking system health and supervisory and regulatory framework</b>	<p>Following the banking crisis in the second part of 1980s, substantial progress has been made to strengthen the regulatory, accounting, legal and supervisory framework, with a substantial upgrading of prudential regulations and supervisory practices. Some relaxation of loan classification and provisioning and disclosure rules occurred in late 1998, though more stringent rules continued to be applied to supervision and restructuring efforts to strengthen the banking system since 1997.</p>	<p>Following the banking sector problems in 1991-94, a comprehensive bank restructuring program was implemented and efforts accelerated to strengthen prudential regulations and bank supervision (regulations governing banks' loan classification and provisioning requirements (November 1992) and foreign exchange positions (April 1993)).</p>
<b>C. Prudential Framework for cross-border risks</b>	<p>Malaysia made considerable progress in strengthening the regulatory framework for the financial and corporate sectors and toward adopting and implementing best practice prudential regulations.</p>	<p>In line with the opening of the capital account that exposed banks to potentially greater foreign exchange risks, efforts were intensified to further strengthen the prudential system, effective from 1999.</p>

Managing risks in cross border flows	Malaysia	Poland
<b>Credit risk</b>	<ul style="list-style-type: none"> <li>• Appropriate limits and procedures are in place to limit exposure to single, large, and connected borrowers.</li> <li>• Banks' exposure to credit risk in FX loans is limited by net open position limits and requirement for borrowers to seek prior approval granted on the basis of borrowers access to FX income.</li> <li>• Loan classification, provisioning, and disclosure requirements incorporate off-balance sheet items with stress tests used to assess balance sheet sensitivity to interest and exchange rate changes and potential losses from off-balance sheet commitments.</li> </ul>	<ul style="list-style-type: none"> <li>• Provisioning requirements for NPLs on-balance sheet assets are applied to off-balance sheet items;</li> <li>• There is no mechanism to monitor by banks the foreign currency exposure of their clients, and credit risk assessments do not incorporate these risks.</li> </ul>
<b>Foreign exchange Rate risk</b>	<ul style="list-style-type: none"> <li>• All commercial banks are required to observe a specific limit on their net overnight open positions in foreign currencies (spot, forward, long, and short). The limit is large, but apparently not binding, and are closely monitored by the central bank.</li> <li>• For derivative transactions, authorized dealers must ensure that their dealings with nonbank residents do not exceed their approved overnight net open FX positions.</li> <li>• Capital adequacy requirement has been extended (not yet in effect) to incorporate market risks. Different minimum capital ratios will be applied to banks based on their risk profile, sectoral exposure and internal controls.</li> </ul>	<ul style="list-style-type: none"> <li>• Open position limits were tightened to take into account both on- and off-balance sheet risks (covering derivative transactions—swaps, options, and currency linked transactions offered as a hedge against inflation by some Polish banks), and to incorporate nonconvertible currencies;</li> <li>• A new reporting system was introduced to monitor off-balance sheet risks and all banks are required to report their open currency positions on a daily basis (some banks already use VAR models to control their currency risks);</li> </ul>
<b>Liquidity risk</b>	<ul style="list-style-type: none"> <li>• Financial institutions are subject to a liquid asset requirement (LAR) that includes among eligible liabilities their foreign liabilities.</li> <li>• A liquidity framework based on maturity ladder was introduced in 1998 to replace LAR by 2000; it projects up to a year of the maturity profile of an institution's assets and liabilities and off-balance sheet commitments; FX liquidity positions are assessed on aggregate rather than individual currency basis, given the small FX positions.</li> </ul>	<ul style="list-style-type: none"> <li>• The central bank issued recommendations to banks to manage foreign currency liquidity, but no explicit regulations are in place.</li> </ul>
<b>D. Financial market Development</b>	<p>Significant efforts were made to deepen financial markets.</p> <ul style="list-style-type: none"> <li>• The <b>interbank money market</b> has developed rapidly, but certain rigidities in monetary operations and instruments may have limited the market development and management of credit and interest rate risks by market participants.</li> <li>• The <b>spot foreign exchange market</b> is dominated by trade-related transactions and volume has declined following the imposition of exchange and capital controls in 1998.</li> <li>• The <b>forward foreign exchange and futures market</b> exists but lack of counterparty apparently reduced market activity and liquidity following the imposition of the controls.</li> <li>• <b>Domestic bond market</b> remained relatively undeveloped because of the limited supply of government securities and captive demand for securities.</li> </ul>	<p>Financial markets are not well developed and deep but improving.</p> <ul style="list-style-type: none"> <li>• An <b>interbank money market</b> became active since 1992 and grew rapidly, in part reflecting improvement in the payment system, and introduction of indirect monetary instruments.</li> <li>• The <b>spot foreign exchange market</b> is developing, but is relatively illiquid with the characteristics of the market largely affected by the zloty fixing mechanism.</li> <li>• The <b>forward foreign exchange markets</b> emerged since 1996, but turnover is relatively low. There is an active nondeliverable forward market in zloty in London.</li> <li>• <b>Domestic bond market</b> is relatively developed.</li> </ul>