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Adopting Currency Convertibility: Experiences and Monetary Policy Considerations for Advanced Developing Countries

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Abstract

This paper analyses issues for developing countries with structurally sound balance of payments that are considering a move to full currency convertibility. The main experiences of industrial countries in their decontrol of international capital transactions are reviewed, with an emphasis on the implications for monetary policy. The paper deals both with stabilization, and the prudential issues, which are especially important in view of the potential for speculative bubbles. Respective roles of the international organizations, IMF, OECD, and the GATT, in assisting the capital liberalization process are discussed.

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Summary

An increasing number of countries, including relatively advanced developing countries, are considering moves to full currency convertibility in the light of the increasingly close integration of industrial countries' financial markets. This paper focuses on the issues for developing countries with relatively strong structural balance of payments. The issues for this group are somewhat different than those for developing countries with weak balance of payments for several reasons. First, paradoxically, developing countries' external sectors have generally strengthened following capital liberalization, while post-liberalization external sector performance in the industrial countries, to which the advanced developing countries are in some ways more closely related, has been mixed. Second, because of their different starting points, priorities for the stronger developing countries are oriented more toward ensuring stability of their domestic financial markets, including issues for monetary policies. The respective roles of the international organizations in this process are noted.

The paper provides evidence from monetary indicators for the industrial countries that the effects of capital liberalization have been very much sterilized. Despite overall increased volatility of foreign credit aggregates, interest rates, and exchange rates, the variability of broad money declined following capital liberalization. Empirical evidence from studies of individual industrial countries is less conclusive.

In terms of policy implications, the outcome for the industrial countries suggests strongly that liberalization of exchange controls must be supported by greater flexibility of monetary policy and development of the instruments necessary to achieve this. Fiscal policy can also play an important role, except in the very short run. It is suggested that newly liberalizing countries need not fear that their domestic currencies will be subject to internationalization. Finally, the important role of strengthened supervision and improved market information in heading off speculative bubbles that might otherwise result from the liberalization is emphasized.

I. Introduction

In the 1970s and 1980s there has been a remarkable process of integration between industrial country economies as capital controls have been eliminated, permitting rapid growth of cross-border transactions. This process has both stimulated, and been stimulated by, increasing sophistication and diversity of financial instruments. An offshoot has been decreasing specialization of transactions, both geographically and by type of institution.

For more advanced developing countries considering moves to capital convertibility, these developments suggest both rewards and risks. The rewards are seen as greater efficiency, as capital is free to move to the best investments and the large administrative costs associated with maintaining and enforcing an exchange control apparatus are avoided. Risks also exist, given the very rapidity of developments in the main financial center markets and the exposure of less developed domestic financial markets to them. The main issues for these countries are therefore how to limit the risks, while reaping the benefits of integration into international financial markets. It is somewhat paradoxical that the recent instances of developing countries adopting full convertibility has been universally accompanied by a strengthening of the capital account of the balance of payments, while in industrial countries the outcome has been more mixed. This suggests that the issues facing more advanced developing countries with structurally strong balances of payments may differ in their emphasis from those in developing countries recovering in the aftermath of the debt crisis.

The purpose of this paper is to discuss the main themes that have emerged in industrial countries that have liberalized their foreign exchange markets, while aiming to retain and improve the stability of their domestic financial systems, and some implications for the more advanced developing countries. The paper is organized as follows: Section II discusses the broad features of industrial countries' experiences with moves to currency convertibility, including a cross-country analysis of effects on financial market volatility. The respective roles of the international institutions, and their codes for liberalization (IMF, OECD, and GATT) are discussed in Section II. Section III then discusses specific aspects of prudential and supervisory policies, and stabilization aspects of monetary policies, in supporting the adoption of full currency convertibility.

II. Industrial Countries' Experiences with Currency Convertibility

Currency convertibility has always been an important consideration in framing macroeconomic policies. In the monetary paradigm, issues of capital mobility stand alongside those of monetary and fiscal policy independence, and the form of the exchange rate regime. Historically, the relationship between convertibility and the exchange rate and monetary regime has not been uniform. For example, under the gold standard system and in the interwar period, freedom from currency controls existed alongside fixed exchange rates, and yet those periods were also broadly characterized by monetary policy independence. In the postwar period, an important strand of the literature has argued that monetary independence can be maintained in an environment of currency convertibility only if the exchange rate is floating, although fiscal policy remains an effective but less flexible instrument to achieve macroeconomic policy independence. On the other hand, if the exchange rate regime is fixed, capital would need to be immobilized in order to achieve monetary independence. However, these results are obtained in an analysis of market-determined financial structures; another degree of freedom exists when credit policy is subject to direct intervention by the monetary authorities, as is the case still in many developing countries, and was earlier in industrial countries also.

Fry (1992) finds in a study of the Pacific Basin developing market economies that some of these economies belong in the latter group. As Fry points out, authorities in some of the Pacific Basin economies simply do not rely on their markets for monetary policy implementation so that nonprice rationing can ensure that domestic credit targets are met regardless of interest rate movements. They also differ from other developing countries in the sense that their capital markets are not formally or informally integrated with markets in the rest of the world (Indonesia is a longstanding exception to this observation), while other developing countries in general do display considerable de facto integration. There is therefore the implication that some economies with relatively flexible exchange rates are functioning with an additional two degrees of freedom relative to the standard market model. In these cases, which are in some sense overdetermined, it is no longer clear if it is the capital controls or the monetary intervention that is the operative constraint.

Cairncross (1973) noted problems with the justification for capital controls, even at that time when they were widespread, because it was difficult to point to any official statement in which they are justified at any length and the need for them tended to be taken for granted. A number of arguments have traditionally been advanced in the literature for the controls, such as weakness of the currency, shortages of capital, insulation of domestic monetary policy, and prudential concerns including money laundering. However, few of these reasons appear to have been relevant in the liberalization experiences of the industrial countries, virtually all of which in the 1970s and 1980s have completely eliminated exchange controls. (The only exception to date is Iceland.) 1/ The reasons the industrial countries dropped the controls were not because it was thought that their

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1/ Restrictions on forward and financial futures transactions in the industrial countries have also virtually been eliminated by industrial countries. In some developing countries, limits are placed on a so-called real transactions basis where capital controls are retained. However, the experience suggests that transactions in forward markets tend to be quite limited when there is less than full financial liberalization.

currencies were no longer subject to weakness, or for the related reason that there was no longer an issue of shortages of savings, or that prudential risk considerations no longer existed. The liberalization has occurred in countries both with structurally strong and structurally weak balance of payments positions, e.g., as signalled by longer-term developments in exchange rates. Moreover, prudential controls were anyway necessary under both controlled or decontrolled approaches to the foreign exchange market. The fundamental reasoning for eliminating exchange controls ran on two tracks--the first was that the controls had increasingly shown themselves to be imperfect complements to domestic monetary policy in preventing destabilizing capital inflows or outflows. The second was that there were growing concerns as to whether or not the controls could actually be made effective, that is, whether or not the administrative arrangements could be made adequate to enforce the controls. Of all the various issues for currency decontrol, the one of probably most relevant to advanced developing countries is that of the relationship to monetary policy and the ability to control speculative short-term capital inflows.

1. Effects of decontrol

Following liberalization of their capital accounts, several industrial countries have experienced sharp short-term inflows and long-term outflows, essentially stock corrections. Studies of the impact of capital account liberalization in industrial countries differ in their focus, are largely descriptive, and provide limited hard evidence. In addition, a number of major industrial countries have had for a long period of time extensive freedom of capital accounts, and only limited relapses back into capital controls, so that their experience is of limited relevance to the post-Bretton Woods international system (Canada, Germany, Switzerland, and the United States). Yet another group of experiences with capital decontrol is very recent, and has not been assessed in the literature.

The most comprehensive and up-to-date study of the aftermath of abolishing capital controls is Artis and Taylor (1989), which found conclusive evidence of a large overall net outflow following the United Kingdom's abolition of controls in 1979. Components of the U.K. balance of payments reacted differently, with little effect on direct investment, but large outflows on account of portfolio investment and bank lending, as reflected in the elimination of a large interest premia in the investment currency and offshore/onshore banking markets. However, the study notes that significant changes occurred in the macroeconomic environment at the same time as the capital liberalization, which does not permit robust conclusions regarding the role of the liberalization in the developments on capital account.

A recent study by Bartolini and Bognar (1992) concludes that the large net inflows into Italy in the period 1985-90 might have been indirectly attributable to the elimination of capital controls, by strengthening the credibility of the commitment to the EMS. However, the hypotheses regarding direct effects tend to be rejected by evidence based on relevant rates of return. Fiscal policy effects on the current account of the balance of payments in particular played a role in the inflows.

Japan's exchange system ("traffic controls") has been continually modified since the comprehensive foreign exchange budget was abolished in 1964 and Japan accepted the obligations of the Fund's Article VIII for current account convertibility. Liberalization tended to shift successively from inflows to outflows as efforts were made to counter exchange rate pressures. For example, controls on outflows and inflows were both adjusted sharply in response to the oil shock in 1973 and 1974. A major breakthrough in capital account convertibility came in 1979 and 1980, with the admission of nonresidents on the gensaki (bond repurchase) market and the introduction of a new foreign exchange law that resulted in virtually complete convertibility. Fukao (1990) notes that the resulting inflows were absorbed in the current account deficit at the time. This was followed by strong outflow pressures from 1981 to 1985, responding in part to high real interest rates in the United States, and temporary controls on certain types of foreign securities investment. Fukao notes that these and later changes led to continued growth of both capital inflows and outflows. The large expansion of foreign direct investment through the 1980s remained consistent with containing pressures for exchange rate appreciation, although the contraction in such investment since has not been. The study concludes that, even with both exchange controls and exchange market intervention, it proved impossible to achieve simultaneously both stable exchange rates and an independent monetary policy.

New Zealand's liberalization of capital controls and its aftermath is well documented--Chapple (1991), Reisen (1991), and Spencer and Carey (1988). The New Zealand liberalization, as in Italy, was followed by sustained capital inflows, and also reversal of the exchange rate devaluation undertaken immediately prior to it. Chapple (1991) associates the contraction of output with the combined liberalization, float, and supporting tight monetary policy, and advances income policies as an alternative. Spencer and Carey (1988), on the other hand, sees further progress with income policies (since achieved) as necessary to complement the reforms, by raising domestic savings and thus permitting lower domestic interest rates and a more depreciated exchange rate.

As in the case of New Zealand, after initial weakness associated with sharp terms of trade changes, the Australian dollar came mainly under appreciation pressure following the removal of most exchange controls in December 1983 (Laker, 1988). Unlike the subsequent free float in New Zealand, the Australian authorities intervened to counter these pressures, mainly as a signalling device to steady the market. Grenville (1994) notes that interest rate volatility has reduced since the liberalization and float, although exchange rate volatility has been greater.

Perhaps the clearest signal that the liberalization process was sustainable and did not have to be reversed, is the fact that only a few industrial countries since 1980 have invoked derogations 1/ to the OECD Capital Movements Code: Denmark 1979-83, Finland 1985-91, Iceland 1961-90, Norway, 1984-89, Spain 1982-85, Sweden 1969-86, and Turkey 1962-85. In a recent episode, connected with the disruptions in the EMS in 1992, the reversions to exchange controls by Ireland and Portugal were very short term and did not prevent substantial adjustment of the exchange rates.

2. Liberalization and financial market volatility

Recent studies have generally concluded that capital controls have provided little insulation for monetary policy (Mathieson and Rojas-Suarez (1993), Haque and Montiel (1990), and Faruqee (1991)). The direction of capital flows after the liberalization of currency controls does not appear to have been sensitive to the presence of a weak or strong currency, as the effect of capital account liberalization has been an outflow of net foreign direct and portfolio investments as residents have expressed their pent-up demands. There has been no generalized impact on short-term capital, because to a significant degree short-term capital flows can be effected through leads and lags. Moreover, in countries with capital controls, the reaction of controls was lagged, so that the sterilization achieved through the capital controls in response to short-term monetary developments was limited. 2/ The combination of lags in reaction time, and leakages through short-term leads and lags and import and export misinvoicing in countries with poor enforcement procedures, means that controls have been a particularly imperfect substitute for domestic monetary policy shifts. 3/ Their main policy use has therefore been to influence long-term capital. The longer-term focus has resulted in accumulating disequilibrium behind the barriers imposed by exchange controls. In the case of some developing countries, this experience may account for the existence of the two degrees of freedom in ensuring domestic monetary policy independence, i.e., use of both foreign exchange controls and domestic credit rationing, with the latter being most likely the more operative constraint.

Capital convertibility was adopted relatively recently by most industrial countries--in the late 1970s and in the 1980s. However, sufficient time has now elapsed in virtually all cases so that comparative before/after experiences can be examined systematically. Moreover, even

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1/ When an OECD member faces serious economic or financial difficulties, it can obtain a temporary dispensation from obligations to preserve freedoms not covered by reservations to the OECD code.

2/ A study of the balance of payments in Japan in the 1970s, Quirk (1979), estimated lags in reaction functions for exchange controls of between six months and one year.

3/ Cairncross (1973) notes that the British controls were not even adjusted to reflect monetary conditions.

some of the countries that have had a longstanding commitment to convertibility had reintroduced them for a period (the imposition by the United States of an interest equalization tax, and reimposition of controls on short-term capital inflows by Germany and Switzerland). Table 1 has been constructed to show the variabilities of some key indicators corresponding to the four-year periods preceding and following the adoption (or resumption) of convertibility. For cross-country consistency of definitions, the data are based on the monetary survey data compiled by the IMF.

For the industrial countries as a group (excluding those that have liberalized very recently), the overall balance of payments indicator, banking system net foreign assets, suggests a limited increase in balance of payments variability, from a simple average change of 1.3 percent per quarter to 1.5 percent per quarter (expressed as a percent of domestic credit). However, the experiences have differed widely between countries, reflecting the fact that factors other than convertibility affected the balance of payments. 1/ The increase was evident in about one half of the 15 countries for which data was available (Austria, Denmark, France, Italy, Norway, Sweden, and Switzerland); it was not a generalized phenomenon.

On average, any impact of the more open balance of payments appears from the available data for monetary indicators to have been sterilized. For the group as a whole, the variability of interest rates increased, and there was an overall decline in the variability of broad money, suggesting that successful offsets were provided by domestic monetary policies. In only four cases (Australia, Austria, New Zealand, and the United Kingdom) was the variability of M2 significantly higher after convertibility.

Table 1 shows an interesting pattern of post-liberalization covariation of interest and exchange rates. In virtually all cases, changes in volatility of the two variables were in the same direction--reduced volatility in France, Germany, Japan, New Zealand, and the United States, and increased volatility in Australia, Austria, Denmark, Finland, Italy, Norway, and Sweden. Other cases (the Netherlands, Switzerland, and the United Kingdom) did not show strong divergences from this pattern.

3. Issues for advanced developing countries

Recent experiences of developing countries that have moved to full currency convertibility are surveyed in Quirk (1994). The recent experiences have typically involved developing countries seeking to strengthen their balance of payments in the context of broad stabilization plans. The impact of the policy packages in many countries, particularly in Latin America, has been sufficiently pronounced that large capital inflows have quickly resulted. For the weak balance of payments countries, the return of investment capital--mainly resident, but some nonresident--has

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1/ For example, as noted above, international financial markets were increasingly subject to innovation over the periods examined here.

Table 1. Relative Stability of Monetary Indicators Before and After Adoption of Currency Convertibility, 1973-90

	Date Until which Capital Controls were in Force	Variability of Monetary Indicators 1/ Before currency convertibility	After currency convertibility
Australia	1983		
Net foreign assets		1.55	1.29
Net domestic credit		3.68	4.86
M2		3.06	3.35
Interest rate		1.38	1.65
Exchange rate		3.38	5.05
Austria	1989		
Net foreign assets		0.54	2.71
Net domestic credit		2.41	2.00
M2		1.80	1.98
Interest rate		0.56	3.75
Exchange rate		5.65	6.28
Belgium	1990		
Net foreign assets		1.32	n.a.
Net domestic credit		2.23	n.a.
M2		2.40	n.a.
Interest rate		0.53	n.a.
Exchange rate		5.12	6.83
Denmark	1988		
Net foreign assets		1.39	1.82
Net domestic credit		5.45	3.18
M2		5.84	2.53
Interest rate		0.54	0.68
Exchange rate		5.47	6.92
Finland	1990		
Net foreign assets		1.25	1.24
Net domestic credit		4.22	1.28
M2		3.11	1.06
Interest rate		0.86	1.15
Exchange rate		3.85	6.92
France	1986		
Net foreign assets		0.32	0.56
Net domestic credit		2.62	2.26
M2		1.87	1.69
Interest rate		0.42	0.39
Exchange rate		5.24	4.97
Germany	1975		
Net foreign assets		0.76	0.32
Net domestic credit		2.57	2.75
M2		3.12	3.03
Interest rate		1.39	0.60
Exchange rate		5.10	3.42
Italy	1990		
Net foreign assets		0.59	1.33
Net domestic credit		3.64	2.24
M2		4.91	2.49
Interest rate		0.58	0.85
Exchange rate		4.72	8.04
Japan	1980		
Net foreign assets		0.34	0.21
Net domestic credit		2.52	2.12
M2		2.58	2.42
Interest rate		0.96	0.33
Exchange rate		5.64	4.58

Table 1 (concluded). Relative Stability of Monetary Indicators Before and After Adoption of Currency Convertibility, 1973-90

	Date Until which Capital Controls were in Force	Variability of Monetary Indicators 1/ Before currency convertibility	After currency convertibility
Netherlands	1986		
Net foreign assets		1.30	0.83
Net domestic credit		1.45	2.75
M2		1.94	2.02
Interest rate		0.32	0.48
Exchange rate		5.43	5.11
Norway	1990		
Net foreign assets		1.19	1.55
Net domestic credit		4.00	1.26
M2		2.73	1.52
Interest rate		0.50	1.49
Exchange rate		3.72	7.31
New Zealand	1984		
Net foreign assets		5.03	4.66
Net domestic credit		7.87	8.68
M2		6.39	9.43
Interest rate		3.50	3.29
Exchange rate		5.40	5.39
Sweden	1989		
Net foreign assets		1.72	2.53
Net domestic credit		4.07	3.25
M2		4.43	4.50
Interest rate		0.83	4.12
Exchange rate		3.58	6.89
Switzerland	1980		
Net foreign assets		1.54	1.98
Net domestic credit		2.36	2.64
M2		2.29	2.15
Interest rate		0.72	0.94
Exchange rate		5.24	5.18
United Kingdom	1979		
Net foreign assets		1.39	1.19
Net domestic credit		2.73	4.14
M2		3.23	4.42
Interest rate		1.74	1.53
Exchange rate		3.26	5.16
United States	1973		
Net foreign assets		0.27	0.18
Net domestic credit		2.37	2.32
M2		2.65	2.20
Interest rate		0.98	0.59
Industrial countries average 2/			
Net foreign assets		1.28	1.49
Net domestic credit		3.39	3.05
M2		3.27	2.99
Interest rate		0.99	1.46
Exchange rate		4.72	5.87

Source: IMF International Financial Statistics.

1/ Means of quarter-to-quarter absolute percentage changes in the four years preceding and four years following adoption of convertibility (change in net foreign assets as percent of net domestic credit).

2/ Simple averages of individual countries.

been most welcome. At a later stage, the inflows have given rise to questions of sterilizing them in order to maintain monetary stability, but thus far this group of countries appears to have had sufficient sterilization opportunities, so that inflation has not reemerged. In these instances, the role of fiscal policy has been emphasized to provide sterilization for the capital inflows. Reducing credit to the public sector has been consistent with the need to avoid monetary crowding-out, and to take the opportunity to achieve structural change toward an increased role for the private sector. The results of these multi-pronged liberalization packages also raise questions about the traditional attitude toward the sequencing of currency liberalization, in that the literature has generally cited a number of preconditions for liberalization of capital controls, including improving the depth of the financial system. The very recent experience in developing countries suggests that the preconditions are minimal and that the necessary exchange rate and interest rate reforms can be undertaken simultaneously in order to have the maximum impact in terms of confidence and irreversibility of the reforms.

In countries with more developed financial systems, such as those in the Pacific Basin area, the trade-offs may be somewhat different--less toward strengthening the balance of payments, and more toward ensuring monetary stability and prudential soundness. While sequencing convertibility would have retarded the capital inflows necessary to strengthen the balance of payments in the recently liberalizing developing countries, the issue does not arise in a country which already has a relatively strong balance of payments and does not need the quick capital injection from a convertibility package. In these countries, the considerations are different in the sense that inherently high domestic rates of return associated with rapid economic development could result in very large inflows in the short term. Nevertheless, the conclusion that the inflows should therefore be phased must be counterbalanced by the consideration that the longer the controls are imposed against basic yield incentives, the larger is likely to be the accumulated net foreign demand for domestic assets, and therefore the extent of the one-time correction when decontrol takes place. This is important because the scope for sterilized intervention to counter the capital inflows following liberalization is limited. If the exchange rate is kept fixed at a depreciated rate while capital outflows are controlled, the extent of sterilization that becomes necessary to offset the capital inflows may be such that domestic credit is almost totally crowded-out; a situation approached by Taiwan toward the late 1980s.

Certainly, any consideration of phasing of capital liberalization by a strong balance of payments country must begin with decontrol of outflows, which would obviously be desirable in minimizing the need for sterilization by domestic policies. Early moves to open up direct investment would also be priority: because (1) the need to establish an intensive relationship by the foreign investor would result in a natural phasing of inflows, and (2) such investment is likely to be the most stable, with positive implications for monetary stability and prudential monitoring. Portfolio investments or bank deposits, on the other hand, would be more prone to speculative bubbles because of the ease of withdrawal of the deposit or capitalization involved. Moreover, the efficiency benefits for the foreign exchange market, by allowing freedom for foreign exchange transactions per se can be gained easily for direct investment, because the underlying investments may be controlled for the stated social or sectoral reasons through, e.g., maximum participation ratios or sectoral requirements. Portfolio investments are more difficult to subject to underlying requirements other than prudential requirements, which will be discussed below. In this context, it can be noted that an overhang of nonperforming loans is also not a likely problem in strong-currency countries.

Issues of speculative bubbles financed by capital inflows and prudential considerations are closely interrelated. Both portfolio and direct investments require good information systems on credit risks from private credit rating services, and uniform accounting standards and practices. 1/ In the case of the direct investment, the required information relates directly to the specific enterprises being considered by the foreign investor, but in the case of portfolio investments and deposits, the required information relates to the banks and securities houses directly, and indirectly to the quality of reporting on enterprises. Prudential ratios for exchange rate risk will be part of the solution for the banks, but are insufficient to provide protection for the economy against foreign capital-driven speculative bubbles, when the more basic information is lacking. These institutional considerations are important from a macroeconomic standpoint, as well as for microeconomic considerations of the individual investor. If the attractiveness of domestic investments is overstated, the capital inflows will be excessive, more unstable, and much more difficult to offset by adjustments to fiscal and monetary policy. Investment opportunities may be good in rapidly growing economies, but they are not unlimited, and the existence of good credit rating systems and prudential monitoring and up-to-date balance of payments data are crucial to provide the sort of early-warning mechanism that might have prevented the 1980s debt crisis. 2/ It is notable that one form of risk is the systemic risk arising from the possible reimposition of exchange controls, so that irreversible movement when liberalizing has direct benefits.

1/ From the foreign investor's standpoint it must be emphasized that the role of information gathering is vital and involves large overheads. There is a reluctance on the part of industrial country investors to go into smaller markets where the impact on overall portfolio return is correspondingly less, relative to the effort required to form business relationships and to develop information flows.

2/ The role of improved circumstances in developing countries in attracting short-term capital is readily evident from recent data, which show that private short-term external debt has risen by almost 50 percent between 1988 and 1993, whereas long-term private indebtedness has risen by 16 percent.

In considering phasing of currency liberalization, distinctions may be made between bond, equity, and credit and money markets. However, such distinctions between various channels for investment may make relatively little practical difference in the impact of opening up the domestic capital market, to the extent that the instruments are fungible. To the extent that they are not fungible, preferences on the part of foreign investors for specific instruments may be exploited in effect to phase the macroeconomic impact. For example, because syndicated lending tends to be aimed mainly at better credit risks, opening up this aspect of the market may have less initial impact on capital inflows. Similarly, with the limited development of equities and securities markets in some countries stocks and bonds purchased by foreigners may also be an early contender for implementation if minimizing inflows is an important consideration. However, as a general rule in the industrial countries the separation of short- and long-term, and banking and capital market activity, is becoming increasingly blurred.

Available studies have focused on the impact of currency convertibility on the balance of payments and thence monetary policy. The impact of currency liberalization on output is more difficult to trace and therefore has not been subjected to empirical testing. Other than in the value added of the financial service industries, the direct impact of currency convertibility on output and external trade is likely to be small. However, given that one of the main aims of capital liberalization is to achieve financial market efficiencies and better selection of appropriate investments, it seems likely that the output gains will dominate in the longer run.

III. Respective Roles of the International Institutions

By definition, arrangements for liberalizing foreign exchange markets are international in character, as there are at least two countries involved in each foreign exchange transaction. There are three main international (not intrinsically regional) institutional fora for issues of currency convertibility: the IMF, OECD, and GATT.

1. International Monetary Fund

The objective of a fully multilateral payments system receives priority attention in the Fund's Articles of Agreement (in Article I), and the Fund accordingly has defined various forms of convertibility that are subject to its jurisdiction and surveillance. The jurisdictional definition of currency convertibility for the Fund is provided by Article VIII, Sections 2 and 3, which requires the ready availability of appropriate means of payment for current international transactions without discrimination or subsidization/taxation. The second element is provided by Article VIII, Section 4, which refers specifically to the need for convertibility of balances held by member governments themselves. The definition of transactions which are current account in the meaning of the Fund's Articles is given in Article XXX(d) as follows: "Payments for current transactions means payments which are not for the purpose of transferring capital and includes without limitations: (1) all payments due in connection with foreign trade, other current business including services and normal short-term banking and credit facilities; (2) payments due as interest on loans and as net income from other investments; (3) payments of moderate amounts of amortization of loans and for depreciation of direct investments; and (4) moderate remittances for family living expenses. One interesting feature of the Fund's jurisdictional definition of current account convertibility is that it relates only to restrictions on payments and transfers and not to restrictions on receipts, except in the case of multiple exchange rates.

Article VI, Section 3 of the Fund's Articles of Agreement states that "Members may exercise such controls as are necessary to regulate international capital movements, but no member may exercise these controls in a manner which will restrict payments for current transactions, or which will unduly delay transfers of funds and settlements of commitments, except as provided in other Articles". The Fund therefore cannot obligate a member to introduce capital convertibility, and the definition and treatment of this form of convertibility is thus not as rigorously defined as for current transactions. However, the policies established by the Fund in its 1977 surveillance decision emphasize the principle of looking into capital movements and capital controls: "The Fund shall consider the following developments as among those which might include the need for discussion with a member: ... (iii) the introduction or substantial modification for balance of payments purposes of restrictions on or incentives for the inflow or outflow of capital; (iv) the pursuit for balance of payments purposes of monetary and other domestic financial policies that provide abnormal encouragement or discouragement to capital flows; and (v) behavior of the exchange rate that appears to be unrelated to underlying economic financial conditions, including effective competitiveness and long-term capital movements". Accordingly, currency convertibility and its place in the overall mix of macroeconomic policies have been examined regularly in IMF country consultations, and also in general terms, including recently in two papers on policies in transition economies and surges of capital inflows to developing countries. 1/

The Fund has also considered various forms of convertibility. Full currency convertibility is the combination of both current and capital convertibility, and it is this form of freedom that from the Fund's standpoint most directly ensures the efficiency of foreign exchange markets. The Fund's Articles also employ the concept of a "freely usable" currency, which is a currency in fact widely used to make payments for international

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1/ In order to give informational content to its jurisdiction and surveillance in the convertibility area, the Fund publishes an Annual Report on Exchange Arrangements and Exchange Restrictions, which covers both current account and capital controls (as well as exchange rate regimes). The Fund also provides technical assistance to members seeking to restructure their markets in order to eliminate exchange controls.

transactions and widely traded in the principal exchange markets. The concept includes only the five major currencies at present: Deutsche mark, French franc, Japanese yen, pound sterling, and U.S. dollar. There is also a concept of "internal convertibility" which means freedom to hold and intermediate foreign exchange domestically, which is not tantamount to permission to make payments or hold assets abroad. In some economies, internal convertibility results from limitations on so-called "dollarization", but it may also result from limitations on the use of the domestic currency, e.g., as in some FSU economies.

2. Organization for Economic Cooperation and Development

OECD members have since 1961 undertaken obligations with respect to the liberalization of invisibles and capital movements. Under the Revised Codes of Liberalization introduced in May 1989 they are now committed to bring about complete liberalization, both of foreign exchange transactions and underlying transactions. Virtually all international capital movements, including short-term movements, are covered by the revised codes. The only significant exceptions are mortgage credit, consumer credit, and operations by governments on their own account. Member countries were not fully ready to liberalize mortgage credit and consumer credit operations in the absence of harmonized regulations on such operations. New items not previously covered by the code are mainly: money market operations, including those in the securities' and interbank markets, short-term financial credits and loans, foreign exchange operations, including spot and forward transactions, swaps, options, futures, and other innovative instruments, financial back-up facilities, financial credit and loans taken out across borders by nonfinancial resident enterprises, deposit accounts, and foreign currency. 1/

The Code of Liberalization of Current Invisible Operations had previously not covered cross-border services provided to residents of OECD member countries by nonresident suppliers, but these are now covered with the May 1989 revision. Such services include payment services, such as checks and transfer of funds, banking and investment services, settlement clearing, custodial and depository services, asset management services, and advisory and agency services. 2/ The obligations are consistent with domestic regulations, but countries are nonetheless required to ensure that domestic regulations do not impede cross-border competition and are applied in a nondiscriminatory manner to resident and nonresident enterprises alike. It could be noted that any form of intervention in the economic systems of two countries could give rise to effective restrictions or incentives for transfers of cross-border resources, including differential income tax

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1/ For discussion of the OECD codes see OECD (1990 and 1992) and Ley (1989).

2/ The right of establishment of nonresident financial service enterprises in host countries is also an obligation under the revised 1989 OECD codes; nonresident enterprises must be free to compete with one another and domestic suppliers on an equal footing.

structures and prudential regulations. However, such a meaning would be so broad as to be meaningless, and both the Fund's Articles and the OECD Codes have established specializations of functions accordingly, and the provisions of the OECD codes are explicitly coordinated with Fund jurisdiction. For instance, under the codes if separate investment currency markets are established for international transactions in securities they are considered as restrictive whenever the exchange rate differential exceeds 2 percent, which is the IMF jurisdictional definition of a multiple currency practice.

3. General Agreement on Trade and Tariffs

On December 15, 1993 negotiators of 117 countries agreed on the final act of the Uruguay Round. 1/ In the area of financial services, because the arrangements for market access of some countries were not considered adequate (especially by the United States but also by others), it was agreed that six months after entry into force of the Services Agreement members would be able to change their commitments and to take additional exemptions. Discussion had focused on a option of a two-tier approach in which certain sectors were to be exempted from the financial services aspects of the MFN. The right to use discriminatory treatment was seen as a complement to some countries' bilateral market opening efforts, if those countries were viewed as offering insufficient market access. The discussion focused on the complexity of regulations in some countries and the need for increased transparency, and issues of whether the complexity and the lack of transparency in fact constituted impediments to services trade. Bankers in the main financial centers typically welcomed the market opening measures, while there is a fear in some less developed financial markets that this could lead to domination of domestic operations by foreign operators.

In terms of concepts, it should be emphasized that the issue of capital convertibility under the GATT refers to the value corresponding to the export of the service across borders, or to the value added resulting from the right of establishment of foreign-owned enterprises on domestic soil. It does not refer to the freedom for the foreign exchange transaction itself, and in this respect there has been a traditional specialization between GATT and Fund responsibilities, with the GATT's focus on the real element of the service transaction. The important benefit of the Agreement on Trade and Services is that it extends multilateral rules to what is a very large segment of world trade, approximately 20 percent, while improving predictability of conditions for investment and service sectors, although many initial liberalization commitments simply consolidate the status quo in the first instance. With regard to the nondiscriminatory principle in the Agreement on Trade and Services (GATS), more than 70 countries have registered exemptions from the provision. Developing countries typically anticipate their participation in financial services liberalization to be a

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1/ As of May 1993, 87 developing countries were members of GATT; in addition 22 other developing countries observe the GATT. 69 Fund members were nonmembers of the GATT.

gradual process which will be geared to the general development situation in each member country.

IV. Main Issues for Monetary Policy

1. Prudential and systemic considerations

A number of countries have expressed reservations on opening up and integrating into international banking and capital markets, because of fear that prudential control will be lost in the process. Moreover, in some countries there are also concerns that liberalization, particularly if extended to offshore banking facilities, will increase the potential for money laundering in domestic markets. These concerns have been heightened by two developments, namely the massive growth in the trading of derivatives, and the development of major banking conglomerates with activities extending beyond traditional banking areas. In the United States, recent financial market reform initiatives underway have taken the form of the relaxation of regulations governing interest and branching by commercial banks, and the centralization of supervision authority. The aim is to achieve a better geographical diversification of balance sheets and a streamlining of regulatory procedures for all parts of the financial system, while retaining the independence of the regulators.

Importation of the sophisticated financial technology that has driven much of the diversification in financial sectors and instruments has been slower in a number of developing countries. For example, trading in foreign exchange futures and options has been limited to relatively few developing countries because it has been found that such transactions are highly sensitive to systemic considerations. In many instances, insufficient confidence has existed to enter into extended financial transactions when there has been the danger of either an interim reversion to controls that would invalidate the transaction, or the emergence of economic disequilibrium that would radically change the macroeconomic context for the transaction. The result has been a relatively large risk factor in assessing the transaction and a correspondingly prohibitive transactions price. In some instances, the delays in adopting these technologies may have actually served the interests of developing countries, given that the countries that have experienced rapid growth in derivatives and related markets are now concerned themselves about their prudential characteristics.

There are implications for the types of convertibility adopted by countries that face choices of financial technologies. For example, foreign exchange controls are unlikely to be necessary to prevent the implementation of inappropriate technology. The reason for this is that such technologies generally require a domestic banking presence, so that those creating the products can tailor them to domestic institutions and conditions. However, liberalization of underlying capital transactions might be affected, in particular the right of establishment under both GATT and OECD rules (OECD, 1990).

An obviously appropriate form of control on foreign exchange markets results from prudential limits on foreign exchange exposure. At the individual bank level, the main protection against risk is currency diversification and hedging of portfolios against exchange rate changes. However, this might not be sufficient to eliminate the prospect of system failure when: (1) all portfolios are subject to the same shock, or (2) when unacceptably large losses by an individual bank result from insufficient internal procedures. To this end, various approaches have been suggested for establishing prudential limits on banks' foreign exchange positions, and the main methods can be identified. First, there is the approach that sums all short and long positions for all currencies (without regard to sign). However, this method takes no account of the history of volatility of the individual currencies, which has led to proposal of a second, "simulation", approach whereby the portfolio loss or profit is simulated over an historical set of exchange rate data. It should be emphasized that the various approaches within the Basle Committee have reached only the proposal stage, and have not yet been implemented. In the meantime, there have been wide variations in practice. Among the developed countries, some have a standard limit on net open forex positions by banks relative to capital, while others prefer to set limits on an individual bank-to-bank basis with high limits for banks with better risk-management systems. Hedge funds and nonfinancial institutions are typically not subject to regulation on foreign exchange activities. Securities houses are also not included in the prudential systems, in a uniformally defined way. In the major countries limitations on banks' exposures range from 10 percent to 40 percent of some definition of capital (Goldstein et. al. 1993). A further qualification in industrial countries is that the treatment of off-balance sheet activities is not generally defined for purposes of prudential regulation. This is becoming increasingly important, because banks have tended to reduce the relative importance of deposit and lending operations, while trading increasingly in both on- and off-balance sheet instruments. However, the precise modalities for a country considering convertibility may matter less than the information system that is put in place to monitor the risk, and a continuing dialogue with the regulatory authority.

For countries considering further development and diversification of their capital markets, clearly there is a trade-off. The first consideration is the increased systemic risk resulting from the introduction of more exotic and difficult to regulate instruments and a larger number of diverse and sophisticated market makers. However, the development of the new technologies also plays an important role in risk management, which is the basic function of the financial system. The choices are difficult, particularly in countries that retain elements of industrial policy that would limit the fully market-based operation of a developed financial sector. 1/ One unambiguous conclusion is that countries need to move quickly to build up their supervisory capacities in all areas to remove the constraint that this might place on development of more efficient financial markets.

Offshore markets often coexist with some retention of restriction on domestic markets. Difficulties with offshore markets include increased possibilities for risky ventures and problems of money laundering. Only in the final stages of liberalization when the prudential apparatus is fully developed would it appear appropriate to introduce offshore banking. However, the OECD committees that deal with these matters do not recommend the institution or retention of exchange controls for purposes of policing money laundering operations. Instead, the enforcement of laws governing money laundering is undertaken through detailed bank examinations and other criminal and tax enforcement channels.

2. Stabilization issues

The recent experience suggests that adapting currency liberalization to the needs of stabilization normally involves considerations of the effects of large short-term capital inflows. In countries at a relatively early stage of financial sector reform or stabilization, the inflows may be easily absorbed because they are part of a process of (re)monetization of the economy. They raise available savings and permit absorption of imported goods at the same time that they impact on the monetary base, and to this extent they are noninflationary and do not require offsetting policy measures. However, in countries that already have sizable monetization, and where stabilization has been underway for some time, the short-term surges will probably require a policy response to the one-time stock adjustment. 2/ In particular, it will generally require both an appreciation of the exchange rate and a contraction of the net domestic credit, so that the money supply continues to grow at a pace consistent with control of inflation. If the exchange rate is to remain fixed, the contraction in domestic credit, typically through open market operations in government securities, will be larger and will be accompanied by a buildup of reserves acquired through foreign exchange market intervention.

In the sterilization operations it must be borne in mind that foreign exchange markets discount temporary intervention, and therefore the ability of the government to hold the exchange rate at an undervalued level will be limited. Moreover, the open market operation, by raising interest rates, could well perpetuate yield incentives for the capital inflows and prolong

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1/ In some ways, the basic issues seem not unlike those faced in the early 1960s when there was intensive discussion of the role of indicative planning as against a more market-related approach to development of the larger economies. See, e.g., Schonfield (1965).

2/ See Schadler et al. (1993) for discussion of developing countries' experiences with surges in capital inflows.

the period of adjustment--again, assuming that the exchange rate is not allowed to appreciate thereby offsetting some of the expected yield. The interest rate effect in offsetting the impact of open market operations on the inflows will, of course, be less, when interest rates are not the determining factor in monetary policy because it is instead conducted through informal rationing or guidance procedures.

The least problematic approach to sterilizing the inflows is to do so through reductions in credit to government, i.e., fiscal sterilization. The fiscal action may also be consistent with a continuing decentralization of the economy and a smaller role for government as dynamic private sectors increasingly take over. The degree to which sterilization can be effected through monetary policy will be itself a function of any remaining capital controls that could limit the extent to which the increase in interest rates resulting from the initial surge is not transmitted into further inflows. However, there is the caveat mentioned above that in some countries the time lag in the response of a tightening of capital controls may mean that the surge does accelerate in the short run, only to be offset say a year later when the full extent of the capital control becomes effective. Obviously, this would lead to short-run overshooting and greater instability in monetary aggregates.

Maintenance of a fixed exchange rate under conditions of capital mobility requires certain structural adjustments in domestic financial markets and monetary policy. For example, it is not possible under those conditions to target simultaneously both inflexibility of the exchange rate and inflexibility of interest rates. In some countries, greater flexibility for interest rates may require setting up arrangements for indirect monetary policy instruments. In other countries, greater exchange rate flexibility may require better institutional arrangements for interbank dealing or ensuring noncollusive bank behavior in handling foreign exchange. Where arrangements for open market operations in treasury bills or central bank certificates already exist, convertibility of the currency may emphasize the need for technical improvements to auction procedures, or closer integration with treasury operations in managing reserve money. 1/

Like fiscal policy, another option in dealing with short term inflows, which generally has little adverse impact, is to ease restrictions on capital outflows. Although the overall direction of capital may be inward, controls on certain instruments and sectors may mean that there is a pent-up demand for specific outflows that could contribute to offsetting the large short-term inflows. Similarly, freeing up import controls can also help given that the financing for the imports in a balance of payments sense is already provided by the initial inflow of capital itself.

1/ Technical assistance has been provided in these areas to a number of member countries by the IMF's Monetary and Exchange Affairs Department.

If capital liberalization is accelerated but not all controls are eliminated at once, the sequencing of opening of various elements of the capital account may need to be sensitive to differences in the functions of financial instruments. For example, if there is an overreliance on debt financing, enterprises may be more vulnerable to fluctuations in interest rates. 1/ Likewise, the banks would share in this risk if the fluctuations should cause business failures. With overreliance may go overregulation, thus causing a "squeezing on a balloon" effect and the rapid growth of nonbank financial intermediation and risks. As liberalization takes place, this latter aspect will require increasing attention to full flow of funds analysis in developing short-term monetary policy, and a suitably broad monitoring mechanism for data in the financial markets. Institution building may also be necessary to accelerate banking, equities, and securities markets development; these include settlement arrangements and improvements in broker and dealer networks.

An important corollary to greater currency convertibility is the development of sufficient flexibility in interest rate policy. In economies that do not have full market determination of interest rates, key market-determined rates are often used as pivots for other major interest rates in the economy, particularly if banks are then able to adjust interest rates about the pivot to reflect appropriate risk. The structure of interest rates may be broadly consistent with market-determined rates and therefore perform adequately the role of shock absorber in situations of capital inflows, but generally the ability to phase the opening of the capital market through changes in regulations will be limited. If the ability to freely transfer through one instrument is widely known, then that instrument will in effect become the vehicle for transfers that will not be significantly affected in a macroeconomic sense by the remaining controls. Most likely, if phasing is chosen, it will therefore take the form of administrative guidance and variations in the intensity of guidance applied to the broad range of portfolio instruments. It can be recalled that although the capital account is liberalized, in emergency situations capital controls could be reimposed, although this becomes increasingly infeasible as the administrative mechanisms are dismantled and reporting arrangements focus on the provision of balance of payments data.

In any phasing of capital liberalization it is important that the reforms proceed on a one-way basis without reversions to controls. Changes in systems can be especially destabilizing for economic activity, and the predictability of the future evolution of the system is a very important consideration. In the process of liberalizing systems, there are two important general principles: one is that the regulations should be simplified as the liberalization proceeds, so that the new rules of the game are clearly understood at each stage, and that the broad rationale and benefits of the measures be explained to the public. The second principle

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1/ On the other hand, this could simply mean that monetary policy is more effective in impacting on economic activity.

is that the liberalization be shifted as soon as possible from a positive to a negative basis, i.e., that all transactions be freely permitted unless otherwise stated. This contributes to confidence in the increasing openness of the system.

Another fear may be that opening-up of the economy will lead to the internationalization of the domestic currency, and thus overexposure of a small open economy to international pressures. However, the experience thus far suggests that the international financial markets prefer freely usable currencies and that the scope for internationalization of other currencies, especially those of newly liberalizing countries, is relatively limited.

Financial liberalization has the potential to create greater instability of money demand functions in the short run. This has sometimes been taken as a reason for delaying reforms, so that the monitoring of monetary conditions is possible through the reform period. While money demand functions are adjusting, increasing attention may have to be paid to other indicators of monetary conditions such as yield curves and exchange rate movements. It is notable that in the major industrial countries a more eclectic view of monetary indicators has emerged in recent years as financial innovation has accelerated. However, in economies with disequilibrium monetary systems, and credit rationing in particular, attention may need to be paid to the more complex specification of disequilibrium demand functions in assessing monetary conditions. Liberalization may actually permit easier specification of the relevant functions. This observation will also be relevant to the role of official action in influencing the base money multiplier--such as nonmarket adjustments of interest rates, rapid shifts in reserve requirements, and other effects of government intervention on the relative disposition of savings between financial instruments (currency, demand and time deposits, and the nonbank instruments).

Bibliography

Artis, Michael J. and Mark P. Taylor, "Abolishing Exchange Control: The U.K. Experience", Greek Economic Review, Vol. II (No. 1, 1989).

Bartolini, L. and G.M. Bognar, "An Analysis of the Process of Capital Liberalization in Italy", WP/92/27, International Monetary Fund (Washington, April 1992).

Cairncross, A.K., Control of Long Term International Capital Movements, The Brookings Institution (Washington, 1973).

Carey, David and Grant Spencer, "Financial Policy Reform--The New Zealand Experience, 1984-1987", Discussion Paper 9/88/1, New Zealand Centre for Independent Studies (April 1988).

Chapple, S., "Financial Liberalization in New Zealand, 1989-1990", UNCTAD Discussion Paper, No. 35 (March 1991).

Faruqee, Hamid, "Dynamic Capital Mobility in Pacific Basin Developing Countries: Estimation and Policy Implications", WP/91/115, International Monetary Fund (Washington, November 1991).

Federal Reserve Bank of San Francisco, "GATS and Banking in the Pacific Basin", Weekly Letter, No. 94/19 (May 13, 1994).

Fieleke, Norman S., "International Capital Transactions: Should They be Restricted?", PPAA/92/20, International Monetary Fund (Washington, December 1993).

Fischer, Bernhard, and Helmut Reisen, "Toward Capital Account Convertibility", Policy Brief, No. 4 (Paris: OECD, 1992).

Fry, Maxwell J., "Financial Opening and Monetary Control in Pacific Basin Developing Market Economies", Paper prepared for the OECD Development Center Meeting "Financial Opening: Developing Country Issues and Experience" (Paris: OECD Development Center, July 6-7, 1992).

Fukao, Mitsuhiro, "Liberalization of Japan's Foreign Exchange Controls and Structural Changes in the Balance of Payments", BOJ Monetary and Economic Studies, Vol. 8, No. 2 (Tokyo: Bank of Japan, September 1990).

Glick, Reuven, and Michael Hutchison, "Financial Liberalization in the Pacific Basin: Implications for Real Interest Rate Linkages", Journal of the Japanese and International Economies, No. 436/48 (1990).

Goldstein, Morris, David Folkerts-Landau, Peter Garber, Liliana Rojas-Suárez, and Michael Spencer, "International Capital Markets Part I: Exchange Rate Management and International Capital Flows", World Economic and Financial Surveys, International Monetary Fund (Washington, April 1993).

Grenville, Stephen A., "The Reserve Bank of Australia's Foreign Exchange Market Operations", Paper presented to SEACEN Seminar on Comparative Foreign Exchange Liberalization Experiences in the SEACEN Countries (Seoul, June 1994).

Hamann, A. Javier, "Financial Liberalization and the Information Content of Money in Indonesia, Korea, and the Philippines", WP/93/88, International Monetary Fund (Washington, November 1993).

IMF, Annual Report on Exchange Arrangements and Exchange Restrictions (Washington, 1993 and various issues).

Laker, John F., "Exchange Rate Policy in Australia", Paper presented at SEANZA Central Banking Course (Kirribilli, November 1988).

Ley, Robert, "Liberating Capital Movements: A New OECD Commitment", OECD Observer (August/September 1989).

OECD, Controls on International Capital Movements: The Experience with Controls on International Financial Credits, Loans, and Deposits (Paris: OECD, 1982).

_____, Liberalization of Capital Movements and Financial Services in the OECD Area (Paris: OECD, 1990).

_____, Code of Liberalization of Capital Movements (Paris: OECD, 1992).

_____, Code of Liberalization of Current Invisible Operations (Paris: OECD, 1992).

Quirk, Peter J., "Capital Account Convertibility: A New Model for Developing Countries", Paper presented to Central Bank Seminar on Frameworks for Monetary Stability, International Monetary Fund (Washington, March 1994).

_____, "Japan's Balance of Payments: Analytic Approaches to the Experience of the 1970s and Synthesis for Medium-Term Projection", DM/79/34, International Monetary Fund (Washington, May 1979).

Reisen, Helmut, "On Liberalizing the Capital Account: Experiences with Different Exchange Rate Regimes", Discussion Paper, OECD Development Centre and University of Basle (Lugano, October 1991).

Schadler, Susan, Maria Carkovic, Adam Bennett, and Robert Khan, Recent Experiences with Surges in Capital Inflows, Occasional Paper, No. 108, International Monetary Fund (Washington, December 1993).

Schonfield, Andrew, Modern Capitalism: The Changing Balance of Public and Private Power (London and New York: Oxford University Press, 1965).

Takeda, Masahiko and Philip Turner, "The Liberalization of Japan's Financial Markets: Some Major Themes", BIS Economic Papers, No. 34, Bank for International Settlements (Basle, 1992).