Capital Account Liberalization
Theoretical and Practical Aspects

By a Staff Team led by Barry Eichengreen and Michael Mussa with Giovanni Dell'Ariccia, Enrica Detragiache, Gian Maria Milesi-Ferretti, and Andrew Tweedie

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The following symbols have been used throughout this paper:

... to indicate that data are not available;
n.a. to indicate not applicable;
— to indicate that the figure is zero or less than half the final digit shown, or that the item does not exist;
between years or months (e.g., 1994–95 or January–June) to indicate the years or months covered, including the beginning and ending years or months;
/ between years (e.g., 1994/95) to indicate a crop or fiscal (financial) year.
“Billion” means a thousand million.
Minor discrepancies between constituent figures and totals are due to rounding.
The term “country,” as used in this paper, does not in all cases refer to a territorial entity that is a state as understood by international law and practice; the term also covers some territorial entities that are not states, but for which statistical data are maintained and provided internationally on a separate and independent basis.
Preface

This study was prepared by a staff team led by Barry Eichengreen and Michael Mussa of the Research Department of the International Monetary Fund. Other members of the staff team were Giovanni Dell’Ariccia, Enrica Detragiache, Gian Maria Milesi-Ferretti, and Andrew Tweedie. The study benefited from helpful comments from Stanley Fischer and numerous other colleagues on the IMF staff. The material in Section II on historical precedents and comparisons and in Appendix I draws on Barry Eichengreen’s joint work with Michael Bordo of Rutgers University, whose contribution is gratefully acknowledged. The authors are indebted to Dennis Quinn for making available his data on capital account liberalization, to Freyan Panthaki for her very capable research assistance, and to Lisa Marie Scott-Hill and Norma Alvarado for their exceptionally able secretarial assistance. Elisa Diehl and Jeff Hayden of the External Relations Department edited the study and coordinated production.

An earlier version of the study was discussed by the Executive Board in August 1998 as part of its ongoing work on an amendment of the Articles of Agreement to make the liberalization of capital movements one of the purposes of the International Monetary Fund. The present version incorporates comments received on that occasion. However, the opinions expressed are those of the authors and do not necessarily reflect the views of the Executive Directors, the management, or other members of the staff of the International Monetary Fund.
I Overview

The explosive growth of international financial transactions and international capital flows is one of the single most profound and far-reaching economic developments of the late twentieth and early twenty-first centuries. This growth has several origins. Prominent among them are the removal of statutory restrictions on capital account transactions, itself a concomitant of economic liberalization and deregulation in both industrial and developing countries; macroeconomic stabilization and policy reform in the developing world, which have created a proliferation of attractive destinations for foreign capital; enterprise privatization, which has created a growing pool of commercial issuers of debt instruments; the multilateralization of trade, which has encouraged international financial transactions designed to hedge exposure to currency and commercial risk; and the growth of derivative financial instruments, which has permitted international investors to assume some risks while limiting their exposure to others.

Along with these forces (indeed, underlying some of them) is the powerful role of technology. This takes the form of the revolution in information and communications technologies, which has transformed the financial services industry worldwide. Globalization has many dimensions, all of which have been stimulated by the decline in the costs of transportation, communication, data processing, and transactions. But nowhere does the revolution in information and communications technologies have such far-reaching ramifications as in the financial sphere.

The financial innovation and liberalization that result are domestic as well as international phenomena. Not only have restrictions on international financial transactions been relaxed, resulting in the explosive growth of international capital movements, but also regulations constraining the operation of domestic financial markets have been relaxed or removed as countries have moved away from repressive financial policies. Domestic and international financial liberalization have generally gone hand in hand. They are responses to many of the same incentives and pressures.

However, in a significant number of cases, financial liberalization, both domestic and international, appears to have been associated with costly financial crises. This apparent association is somewhat deceptive, because financial crises are complex events that usually have multiple causes and that have occurred in less liberalized as well as more liberalized financial systems. Nevertheless, there have also been several cases in which financial liberalization, including capital account liberalization, is reasonably assessed to have played a meaningful role in crises. This raises a serious question about whether and under what conditions financial liberalization—and particularly capital account liberalization—will be beneficial rather than harmful. The answer advanced in this paper is the following. Capital account liberalization, and financial liberalization more generally, is essentially inevitable for all countries wishing to take advantage of the substantial benefits of broad participation in the open world economic system in this modern age of technology and communications. Financial liberalization also has its dangers, as liberalized systems generally afford opportunities for individuals, enterprises, and financial institutions to undertake greater and sometimes imprudent risks, thereby raising the potential for systemic disturbances. There is no way to completely suppress these dangers, other than through draconian financial repression, which creates worse problems. The dangers, however, can be limited quite considerably through a combination of sound macroeconomic policies to contain aggregate financial imbalances and ameliorate the effects of financial disturbances and sound prudential policies to ensure proper private incentives for risk management. These must be backed up by adequate supervision and regulation, especially of the financial sector. With these important safeguards, capital account liberalization and broader financial liberalization are not only inevitable, but will clearly be beneficial.

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1The May 1997 edition of World Economic Outlook (International Monetary Fund, 1997) takes globalization as its theme and traces the implications not just for financial markets but also for the rest of the world economy.

2For an overview of these developments see Werthamer and Raymond (1997).
At the theoretical level, the controversy over the benefits of financial liberalization reflects diverging views: are liberal financial markets predominantly efficient or, instead, are they so distorted by information asymmetries and other problems that financial transactions perceived to be beneficial to their direct participants too often yield outcomes detrimental to the general welfare? A large “efficient markets” literature argues the first hypothesis. At the same time, some observers insist that asymmetric information—a situation where one party to a transaction has less information than the other—is a key feature of capital markets and that it shapes the outcome of financial transactions so as to limit the efficiency of resource allocation. This is not to deny that information asymmetries exist also in other markets or that such problems, even when relatively mild or adequately controlled, can be a barrier to privately and socially beneficial transactions. However, they are not in general so serious as to preclude trade in goods and services altogether. Monitoring and verifying the quality of a tangible good or labor service are usually relatively straightforward and are often not a central issue, whereas for many financial transactions, acquiring accurate and reliable information to establish value is the essence of the issue.

Problems of asymmetric information are particularly prevalent in the international domain, where geographical and cultural distance complicates the task of acquiring and analyzing information. The revolution in information and communications technologies, by reducing data acquisition and processing costs, has had a particularly powerful effect in stimulating international financial transactions. And if the information and communications revolutions are irreversible, so is the growth of international capital flows.

The growth of international financial transactions concomitant with the information revolution thus poses a dilemma for policymakers. To the extent that information asymmetries are only attenuated but not eliminated, financial markets will continue to be affected to some degree by adverse selection, moral hazard, principal-agent problems, and herding behavior (see Box 1). In this setting, sharp investor reactions can give rise to unpredictable market movements and, in the extreme, financial crises. If these problems are serious enough, as they sometimes appear to be, then it may be necessary to temper the general presumption that market liberalization enhances the efficiency of resource allocation. A more accurate statement is that international financial liberalization, like domestic liberalization, unambiguously improves efficiency only when accompanied by the appropriate policies to limit moral hazard, adverse selection, excess volatility, and related problems and to contain their potentially damaging consequences.

Also, as has long been recognized, sound macroeconomic policies are essential (although not sufficient) for maintaining reasonable financial stability. Indeed, a liberalized financial system is probably more demanding in this respect than a repressed system, in which significant financial imbalances can sometimes be suppressed for extended periods, at great cost in terms of economic efficiency and often also of good governance. However, the ability to substitute financial controls for sound macroeconomic policies is being eroded by the economic and technological forces that are fundamentally driving financial liberalization. Even controls that may serve better purposes are generally subject to these forces, and policymakers will need to search for new ways, compatible with more liberal financial systems, of maintaining financial stability.

These observations provide the context for a discussion of the liberalization of capital account transactions and policy toward international capital flows. Capital account liberalization is defined as freedom from restrictions on transactions in the capital and financial accounts of the balance of payments. Note the distinction between controls on the one hand and taxes on the other. While current account convertibility is defined under Article VIII of the IMF’s Articles of Agreement as freedom from restrictions on the making of payments and transfers.

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2For example, a firm producing and exporting a computer chip or a pharmaceutical product will know more than a potential importer about the quality-control methods under which it is produced and hence about the uniformity and reliability of the good, which will limit the volume of trade.

4In addition, contracts are more difficult to enforce when they span national borders and legal jurisdictions. In principle, one way of neutralizing some of the adverse effects of information asymmetries is to write contracts whose payoffs are contingent on observed outcomes. But where enforcement is less effective (i.e., in the international domain), such relatively complex contingent contracts will be more difficult to write.

5Historical experience is consistent with this view: even in the last era of financial globalization, prior to 1914, markets were significantly integrated only in securities issued by governments and railways, entities with tangible assets (the power to tax in the first instance, the road bed, railway, and rolling stock in the second) that were therefore largely exempt from the most severe information problems. The historical evidence on these questions is summarized in the next section and described in more detail in Appendix I.

6Adverse selection arises in financial markets characterized by asymmetric information when the average quality of agents active in the pool of potential borrowers deteriorates with increases in the interest rate. Moral hazard arises in several areas, including when borrowers alter the characteristics of their investment projects after contracting a loan. Herding is defined as a situation where investors have an incentive to emulate the actions of other investors. For further discussion of some of these terms, see Box 1.
While asymmetric information is present in many economic relationships, some economists believe that it is particularly pervasive in financial markets. Asymmetric information gives rise to adverse selection when the party does not know a relevant characteristic of the product that is being transacted or of the preferences or technology of the other party. For instance, the buyer of a used car may not know if the car is a “lemon,” or a lender may not know the riskiness of the borrower applying for a loan. Adverse selection typically results in inefficient pricing and, in extreme cases, may prevent efficient transactions from taking place. In credit markets, adverse selection may lead to credit rationing.

When one party cannot observe a relevant action to be undertaken by the other party, moral hazard may result. For instance, an insurer may not be able to observe whether the insured takes precautions to curb risk. Thus, a contract obliging the insured to take such precautions is not enforceable, and too much risk will result. In financial markets, a creditor may not be able to observe whether the borrower will invest in a risky project or a safe project, and, if the borrower is protected by limited liability or guarantees of some sort, too much investment in risky projects will result. An extreme case of moral hazard occurs when companies or banks with negative net worth borrow to gamble for redemption; namely they invest in ventures that can yield a high return (enough to stave off bankruptcy) but have a low probability. Gambling for redemption can result in large losses for the lenders.

Moral hazard can also arise in the context of principal-agent situations, in which a principal asks an agent to perform certain tasks on her behalf (in exchange for compensation), but cannot perfectly monitor the execution of the tasks. To the extent that the agent's preferences differ from those of the principal, the outcome will be suboptimal. For example, principal-agent situations arise when a small investor invests in a mutual fund and cannot perfectly monitor the investment strategy of the fund manager, or when equity holders entrust managers with running the business they own.

The importance of asymmetric information in financial markets is underscored by the fact that the very existence of financial institutions can be explained on asymmetric-information grounds. For instance, it has been argued that banks and other financial intermediaries specialize in assembling and analyzing information about borrowers and their investment projects, thereby attenuating informational asymmetries. From this perspective, banks and other financial intermediaries act as “delegated monitors” on behalf of their customers.

For current international transactions (defined in Article XXX(d) to include certain transactions that are defined as capital transactions for purposes of balance of payments statistics), Article VIII does not proscribe the imposition of restrictions, such as import tariffs and taxes, on the underlying transactions. Correspondingly, capital account convertibility is taken here to mean the removal of exchange and other controls but not necessarily all taxlike instruments imposed on the underlying transaction, which agents retain the option of undertaking.

The next section describes recent trends in capital flows, focusing on the experience of developing countries, and elaborates on the role of technology in stimulating the growth of international financial transactions. It documents the far-reaching consequences of these developments, including the pressure they impart for the removal of capital controls and for changes in the exchange rate regime. Concludes with the observation that, despite experiences with serious financial crises in a number of cases, the decisions of many countries to proceed with financial liberalization are important evidence that such liberalization, including capital account liberalization, is generally beneficial when carried out under appropriate safeguards.

The paper then examines what economic theory has to say about the benefits and costs of capital mobility. It lays out the classical case for international capital mobility as intertemporal trade, as a mechanism for risk sharing, and as a means for enhancing the efficiency of financial services. It examines the counterarguments arising from problems of asymmetric information and other distortions that, if serious enough, could make financial liberalization harmful. It notes that, as some of these problems are the direct consequence of misguided government policies that should be reversed or can be removed by countervailing policies, they provide an argument for policy adjustment in connection with, rather than as a true barrier to, successful financial liberalization and the benefits that such liberalization can bring. Other problems, especially some of those associated with asymmetric information, are intrinsic to financial markets, both domestic and international, and cannot be entirely overcome. Noteworthy in this regard are problems of herding that may contribute to excessive volatility in financial markets and the nexus of problems relating to the banking system, which may be subject to runs and is influenced by moral hazard arising from expectations of government support to contain such runs. Here the answer is to structure appropriate prudential policies (especially for the banking system and to contain short-term debt), and supporting macroeconomic policies, to limit these problems to the point where the risks potentially arising from a liberalized financial sys-
tem are at an acceptably low level—a level at which the benefits of liberalization clearly outweigh the costs. This is the approach taken by countries with respect to domestic financial liberalization, and the same approach is relevant for international financial liberalization.

The fourth and fifth sections assess countries’ practical experience with capital account liberalization by reviewing studies of the effects of capital account convertibility on economic growth, cyclical stability, and susceptibility to crises. This review highlights the difficulty of making unconditional statements like “capital account convertibility is beneficial” or “capital account convertibility is harmful.” Rather, what emerges is the need to marry capital account liberalization with domestic policy reform to ensure that the favorable effects dominate.

This leads to a discussion of the prudential regulation of financial institutions and markets, the role that can be played by limits on international capital flows, and the issue of sequencing. For purposes of this discussion, the range of prudential measures toward capital account transactions is conceived broadly, so as to encompass capital controls in the form of statutory prohibitions on certain transactions, open position limits, and taxes and tax equivalents that provide a pecuniary disincentive for such flows. The core question is what prudential measures are necessary to limit systemic risks that may arise more easily in liberalized financial markets and thereby ensure successful liberalization of the capital account.
This section describes the remarkable growth of international capital flows and places it in historical perspective.

Changing Volume and Composition of Capital Flows

No reader will be oblivious to the explosive growth of capital flows, especially private capital flows to developing countries, during the 1990s. Net flows to developing countries have tripled from roughly $50 billion a year in 1987–89 to more than $150 billion in each of the three most recent calendar years. Private flows now dominate official flows: where private flows accounted for only 3 percent of developing countries’ domestic investment as recently as 1990, as of 1996 they accounted for fully 20 percent (World Bank, 1997, p. 9). Just 10 countries receive about 80 percent of net private flows to developing countries, and the top 14 account for 95 percent, but increasing openness to international financial transactions is nonetheless general: few developing countries are unaffected.

To understand the forces creating increasing international capital flows, the reader should recall that the phenomenon is not limited to developing countries. Indeed, the cross-border transactions in bonds and securities of the industrial countries are growing even faster. Those of industrial economies have grown, from some $50 billion in 1979–82 to nearly $550 billion in 1993–96. If much of the discussion focuses on developing countries, this is because it is there that the problems that can be created by volatile international capital flows have been most dramatic.

Also important is the extent to which the channels for private capital flows have changed. For many years commercial bank lending accounted for nearly two of every three dollars of private capital flowing to developing countries. It has now been overtaken not only by foreign direct investment but also by portfolio capital flows (Table 1). Today, bonds and equities account for more than a third of total private capital flows to developing countries, whereas bank lending accounts for less than a third (see Figures 1 and 2). These developments reflect technological change, which has reduced the cost of issuing and trading securitized financial instruments; privatization, which has created a population of profit-oriented companies in which it is attractive to invest; far-reaching deregulation of financial markets in key industrial countries in the 1980s and early 1990s, which played an important role in allowing developing countries to raise capital in the form of bonds and equity; the growth of institutional investors like pension funds and mutual funds with an appetite for foreign securities; and macroeconomic and trade reform in developing countries, which has rendered emerging markets more attractive to investors seeking to diversify internationally.

Historical Precedents and Comparisons

It is commonly asserted that this situation, in which financial markets are globally integrated, debts are securitized, and holdings are widely dispersed, is unprecedented. With equal frequency it is rebutted that there was an earlier period of equally extensive financial globalization, namely, the 40 or so years before 1914. A representative discussion of this era can be found in Folkerts-Landau (1997), pp. 234–38.
in Appendix I, it is true that the financial integration of the pre-1914 era remains unsurpassed. Interest differentials on government bonds were slim even by current standards, and the volume of net capital flows, scaled by GDP, remains unmatched even today.

In other respects, however, present-day financial markets are more closely integrated than those of the past. An important difference is that the range of financial instruments that are traded internationally is broader today. In the nineteenth century, international financial transactions were dominated by claims on governments, railroads, and mining companies; today, in contrast, a broader range of securities are traded internationally, including claims on manufacturing and service-sector companies. In addition, whereas bonds (and debentures) were more important than equity claims before 1914, the two types of instruments contribute in roughly equal proportion to international investment today. Finally, foreign direct investment, which is now undertaken primarily by multinational firms in a wide variety of manufacturing and service sectors, was undertaken then by freestanding companies that specialized in resource-extracting activities. These differences underscore the importance of information asymmetries and changes over time in the mechanisms for overcoming them. When information is highly asymmetric, investors will concentrate on projects and companies whose assets are tangible and whose operations are most transparent. Hence the disproportionate concentration of nineteenth-century investors first on government securities and then on railways, canals, ports, mining companies, and public utilities.

Similarly, when asymmetric information aggravates problems of agency and corporate control, investors will prefer debt instruments, the returns on which are less closely tied to management actions than is the return on equity. By supplementing shareholders’ stakes with nonvoting debt, relatively concentrated equity stakes diminish the collective action problem for equity holders seeking to monitor management actions and to overcome the principal-agent problems (i.e., problems of incentive compatibility between owners and managers) created by asymmetric information. Hence the preference of pre-1914 investors for debt rather than equity.

Finally, the foreign direct investors’ reliance on freestanding companies rather than multinationals before 1914 can also be understood in terms of the risks created by asymmetric information. As Wilkins (1998) puts it, freestanding companies “were structured to solve the problem posed earlier: business abroad was risky; it was hard to obtain adequate and reliable information about firms in distant lands; returns were unpredictable; but there were clearly opportunities abroad; a company organized in the source-of-capital country, with a responsible board of directors, under source-of-capital law, to mobilize capital (and other assets) and to conduct the business in foreign countries could take advantage of the opportunities, while reducing transaction costs by providing a familiar conduit” (p. 13, emphasis added).

Table 1. Portfolio and Direct Investment Flows
(Billions of U.S. dollars; annual averages)

<table>
<thead>
<tr>
<th>Gross Outflows</th>
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<tr>
<td>Industrial countries</td>
<td></td>
</tr>
<tr>
<td>Direct investment</td>
<td>28.6</td>
</tr>
<tr>
<td>Portfolio investment</td>
<td>11.8</td>
</tr>
<tr>
<td>Developing countries</td>
<td></td>
</tr>
<tr>
<td>Direct investment</td>
<td>0.4</td>
</tr>
<tr>
<td>Portfolio investment</td>
<td>5.5</td>
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</tbody>
</table>


Notes:

10This discussion, like that in Appendix I, draws on Bordo, Eichengreen, and Kim (1998).
11Freestanding companies were companies incorporated in the capital-exporting country for the express purpose of establishing a business presence in an emerging market. For details, see Appendix I.
12This response can create agency problems of its own, given the problem of incentive compatibility that can arise between bondholders and equity holders. Thus, for example, management may tend to take on riskier projects to benefit equity holders at the expense of debt holders. One interpretation of the historical experience is that this agency problem was less severe than the one described in the text.
Growth of International Financial Flows in Perspective

The greater breadth of international financial integration today can be understood, at least in part, in terms of the diminution of information asymmetries. Here recent changes in information technology have played an important role. Computer links enable investors to access information on asset prices at minimal cost on a real-time basis, while increased computing power enables them to calculate correlations among asset prices and between asset prices and other economic variables. The decline in telephone tariffs, the advent of satellite television and the Internet, and other improvements in communications technologies enable them to follow developments in far-distant countries and companies much more efficiently than before. Important information asymmetries remain, but it is far easier for, say, a U.S. resident to obtain information about the balance sheet, business strategy, and regulatory environment in which, say, an Argentine utility company operates than it was several years ago. This environment encourages institutional and individual investors to hold an increasingly broad range of foreign securities rather than limit their purchases to that relatively narrow subset of securities issued by governments and corporations with the most tangible assets and transparent operations.

At the same time, new technologies make it increasingly difficult for governments to control international capital flows. The fact that computerized trading makes it easy to create synthetic positions in derivative markets, for example, complicates the task of monitoring or attempting to control or tax foreign exchange transactions. Technologies facilitating the transfer of funds between financial centers (and to offshore corporate and financial subsidiaries) and the growth of non-deliverable currency forward contracts make it increasingly difficult for individual countries to effectively enforce capital controls (see Box 2).

The liberalization of capital markets, domestically and internationally, is an ongoing process, with profound implications for the kinds of policies that governments will find it feasible and desirable to follow.

Role of Policy in Facilitating Portfolio Capital Flows

Technological progress, by reducing transactions costs, may have encouraged international financial flows, but the explosive growth of cross-border borrowing and lending would not have been possible without the simultaneous liberalization of national policies on international capital flows. To be sure, the relaxation of statutory controls on portfolio capital flows is itself a response, at least in part, to these same technological forces, which require controls to become more invasive and, hence, more distorting if they are to retain their effectiveness. At the same time, other factors have contributed to the relaxation of controls, notably macroeconomic stabilization and the trend in many parts of the world toward the deregulation of economic activity and greater reliance on market-based resource allocation.

The relaxation of statutory restrictions on international capital flows has been a gradual but persistent process in the industrial countries. The figure in Box 3 shows changes over time in the prevalence of various restrictions on international capital flows. As Appendix II details, international financial transactions were tightly controlled immediately after World War II. Significant liberalization then occurred from 1950, with the creation of the European Payments Union, through the middle of the 1960s. In the second half of the 1960s, progress slowed as

<table>
<thead>
<tr>
<th>Year</th>
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<tr>
<td>1973-78</td>
<td>-10.7</td>
</tr>
<tr>
<td>1979-82</td>
<td>-10.3</td>
</tr>
<tr>
<td>1983-88</td>
<td>-18.9</td>
</tr>
<tr>
<td>1989-92</td>
<td>-59.4</td>
</tr>
<tr>
<td>1993-96</td>
<td>-86.6</td>
</tr>
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13Other technological advances, while not necessarily reducing information asymmetries, also encourage international investment. For example, increased computing power facilitates the construction and pricing of complex derivative securities, which allow investors to assume only those risks they wish to bear and to hedge the rest. Similarly, electronic trading allows investors to purchase small lots of securities at lower cost and thereby to diversify away concentrated risks. The declining cost of computing has also fueled the growth of the mutual fund industry, another channel through which small investors can diversify risks.

14Even without advanced technology, it is difficult to distinguish transactions associated with the provision of trade credits and with the hedging of foreign exposures from purely speculative positions taken in anticipation of future exchange rate changes, complicating schemes to tax "hot money flows" while leaving productive foreign investment unaffected. See Folkerts-Landau and Ito (1995), p. 96.

15Along with important warnings about the accuracy of these summary indicators.
policymakers were forced to grapple with growing payments imbalances among the industrial countries and pressures on their Bretton Woods exchange rate parities. From the late 1970s, liberalization accelerated again. European countries then took major steps toward opening their capital accounts following the creation of the European Monetary System at the end of the 1970s and the adoption of the Single European Act in the second half of the 1980s. (The first of the two panels in Box 3 shows sharp reductions in the prevalence of restrictions on capital account transactions around the time of these two events.) Restrictions on capital account transactions in the industrial countries then fell to very low levels in the first half of the 1990s. Thus, while the pace of liberalization has varied over time, the direction has been uniform—toward progressively greater capital account convertibility.16

Developing countries have also adopted policies conducive to increased international capital flows, although progress has been less uniform and less unidirectional. (Again, see Appendix II.) In some regions, progress toward capital account liberalization was reversed in the early 1980s at the time of the debt crisis. In particular, there was an increase in the prevalence of restrictions on capital account transactions in Latin America, where external debt problems were most severe.17 However, the reimposition of controls was not sustained. Restrictions on capital account transactions began to decline again at the end of the 1980s, once the highly indebted Latin American countries put the worst aspects of the debt crisis behind them, with the help of the Brady Plan and through significant shifts in the stance of their macroeconomic and structural policies, and once markets in the industrial countries evinced a renewed willingness to undertake lending to developing countries. Thus, even countries that have shown a willingness to reimpose controls in times of crisis have sought to return to the path of capital account liberalization and restore their international capital market access when conditions permit.18

16With the exception of a temporary increase in the prevalence of multiple exchange rate practices following the breakdown of the Bretton Woods System of pegged but adjustable exchange rates.

17Accompanied by a rise in the prevalence of measures requiring the surrender of export proceeds.

18As noted in Appendix II, the same has been true of European countries that reimposed controls in response to currency crises in 1992-93. Johnston and others (1998) similarly note that although the pace of liberalization slowed in 1997, and some of the Asian countries most directly affected by the crisis reimposed a variety of restrictions on capital account transactions, the recent rise in volatility in emerging markets did not trigger a generalized resurgence of capital account restrictions.
Financial liberalization frequently has been accompanied by efforts to strengthen prudential regulation. Quirk and Evans (1995) document that countries that have liberalized their capital accounts generally have made concurrent efforts to strengthen prudential supervision and regulation, especially in the area of the foreign exchange risk assumed by financial institutions. In most of the countries they considered, the bulk of the reforms to improve prudential standards took place before or together with capital account liberalization, although some countries (Costa Rica, Guyana, Indonesia, Jamaica, and Peru, for example), strengthened prudential measures only after adopting capital account convertibility. In countries where banking sector problems worsened after rapid liberalization of the capital account (Argentina, Costa Rica, Latvia, and Venezuela, for example), difficulties often reflected the tendency for liberalization to magnify preexisting weaknesses in banks’ balance sheets. In particular, liberalization in a context where banks were already weak encouraged gambling for redemption and facilitated asset stripping.¹⁹

Three Observations on Policy

First, capital account liberalization has gone hand in hand with domestic economic and financial liberalization. Periods of external financial liberalization have also generally been periods of domestic financial deregulation. The removal of certain controls on capital account transactions by the leading European countries in the 1950s was part of the general trend toward progressively greater domestic financial liberalization as countries emerged from the highly regulated and controlled wartime environment. External financial liberalization in East Asia and Latin America in the 1970s was part of a broader

¹⁹"Gambling for redemption" is defined and explained in Box 1.
Box 2. Nondeliverable Forwards

An example of how financial innovation can increase the incentives to evade capital controls, and the ease of doing so, involves nondeliverable forward contracts. The Mexican peso crisis of 1994 and subsequent volatility in emerging market currencies created a demand for financial products offering investors the ability to hedge against exchange rate risk in emerging markets. One response has been the introduction of a variety of future contracts. In particular, nondeliverable forward contracts have assumed a significant role. These are offshore contracts for currencies for which there are capital controls restricting forward market activity, or for which an onshore forward market does not exist.

Typically, offshore markets for nondeliverable forwards are in New York and London, although there is also an active Asian market in Singapore and Hong Kong S.A.R. Nondeliverable forwards require no physical delivery of currencies. At the inception date, parties set a price for the contract. At maturity, the contract is settled on the basis of a rate indexed to the underlying currency, so that only the difference between the agreed price and the realized price is exchanged. In the presence of capital controls intended to drive a wedge between domestic and international interest rates, nondeliverable forwards may contribute to evasion to the extent that, by offering a way to hedge against exchange rate risk, they increase the appeal of foreign credit obtained through delayed, anticipated, or misinvoiced trade payments.

account convertibility. As Appendix III explains, many financial crises have occurred soon after domestic financial markets have been deregulated and restrictions on international financial transactions have been relaxed. Is it then the domestic financial deregulation or the capital account liberalization that “caused” these crises? The fact that some banking crises occur while the capital account remains controlled and that others—for example, the Savings and Loan crisis in the United States—have not had a significant international dimension is a reminder that external financial liberalization cannot be assumed to be at the root of all these problems, although detailed analysis suggests that, in many cases, precipitous or badly executed external liberalization has magnified the adverse effects of domestic policy problems.

Second, the policy on portfolio capital flows has differed from the policy on foreign direct investment. The preceding discussion, like much recent attention, has focused on policy on portfolio capital flows and on the role of technology in eroding the effectiveness of controls designed to limit the magnitude of portfolio capital movements. But while the rapid pace of change affecting the financial services industry may be undermining the effectiveness of controls on portfolio capital flows, detecting and controlling inward foreign direct investment remain relatively straightforward. Many countries continue to regard foreign direct investment (the purchase by foreign investors of “national champions” in particular) as a sensitive issue that warrants some control. As of the end of 1996, 184 countries surveyed by the IMF, 144 still maintained some form of controls on foreign direct investment: 13 of 23 advanced industrial economies and 131 of 161 developing countries.

Controls on foreign direct investment take various forms, including special procedures for approving investment applications, regulating the repatriation of profits, and restricting the liquidation of the initial investment. In industrial countries, such controls generally focus on “strategic sectors,” such as telecommunications and banking, while in developing countries they cover a broader range of industries. That said, in recent years a number of developing countries have taken important steps to liberalize inward foreign direct investment. Thailand, for example, lifted most restrictions on inward foreign direct investment in import-competing industries in the 1970s and deregulated foreign investment in export industries in the 1980s. Chile similarly liberalized inward foreign direct investment between 1985 and 1989.

Third, it is important to clearly distinguish between controls on inward and outward capital flows. A large body of literature (reviewed in Appendix IV) casts doubt on the effectiveness of controls designed to inhibit outward portfolio capital flows, especially when a devaluation is anticipated. Investors who ex-
Three Observations on Policy

Box 3. Measuring Capital Account Liberalization

Providing a quantitative measure of capital account liberalization is difficult. In particular, it is hard to quantify restrictiveness of existing capital control measures. The left panel of the figure presents several measures of official restrictions on international capital flows in industrial countries, and the right panel presents an overall index of capital account openness, derived from the annual IMF publication Annual Report on Exchange Arrangements and Exchange Restrictions. The left panel shows the fraction of countries that impose three types of restrictions on international capital flows: restrictions on payments for capital account transactions, surrender of export proceeds, and multiple exchange rates. The panel on the right provides a measure of capital account openness constructed by Quinn and Inclán (1997) by coding measures limiting international capital mobility according to their degree of restrictiveness (outright prohibition being the most restrictive, followed by quantitative restrictions—approval required, taxation, and no restriction). The figures clearly show the increase in the degree of capital market liberalization, especially during the last decade.

The Capital Account in Industrial Countries
(Average across countries)

<table>
<thead>
<tr>
<th>Year</th>
<th>Restrictions 1</th>
<th>Degree of openness 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1966</td>
<td>0.9</td>
<td>0.5</td>
</tr>
<tr>
<td>1970</td>
<td>0.8</td>
<td>1.0</td>
</tr>
<tr>
<td>1975</td>
<td>0.7</td>
<td>2.5</td>
</tr>
<tr>
<td>1980</td>
<td>0.6</td>
<td>3.0</td>
</tr>
<tr>
<td>1985</td>
<td>0.5</td>
<td>3.5</td>
</tr>
<tr>
<td>1990</td>
<td>0.4</td>
<td>4.0</td>
</tr>
</tbody>
</table>


1 Based on IMF classification.
2 Based on Quinn and Inclán (1997).

pect a discrete change in the exchange rate in short order can look forward to substantial (annualized) capital gains if they succeed in evading controls on outflows and limits on taking short positions in domestic financial markets. Given this strong incentive, it is perhaps not surprising that all but the most comprehensive and repressive controls on outflows have had at best limited effects.

There is more empirical support for the notion that controls on capital inflows can have significant effects. When the motivation for capital movements is gradual portfolio diversification designed to attain a better trade-off between risk and return over time, for example, and not a scramble to avoid the large capital losses associated with an impending devaluation, it is more likely that controls and taxlike measures designed to influence the composition and volume of inward capital movements will have noticeable effects. The evidence is mixed. In particular, studies that distinguish the short run from the long run suggest that controls are likely to become progressively less effective the longer they remain in place, as investors and others discover new routes for circumventing them, leading the authorities in turn to broaden the coverage of existing restrictions to limit avenues for evasion. Still, a number of analysts conclude that measures adopted by countries like Chile, Colombia, and Israel to influence the level and composition of portfolio capital inflows have not been without effect.

21 See Appendix IV and Folkerts-Landau and Ito (1995) for a detailed discussion of the experience with controls on capital inflows.

22 This point is emphasized in Johnston and others (1998).

23 Again, for details see Appendix IV.
III  What Theory Says About the Effects of Capital Account Liberalization

This section reviews three strands of theoretical literature on the effects of financial liberalization: the classic case for liberalized financial markets, models of asymmetric information, and models of domestic distortions.

The Classic Case for Capital Mobility

The classic case for international capital mobility is well known but worth restating. Flows from capital-abundant to capital-scarce countries raise welfare in the sending and receiving countries alike on the assumption that the marginal product of capital is higher in the latter than the former. Free capital movements thus permit a more efficient global allocation of savings and direct resources toward their most productive uses.

Capital mobility creates opportunities for portfolio diversification, risk sharing, and intertemporal trade. Households, firms, and, for that matter, entire countries can borrow when incomes are low and repay when they are high, smoothing consumption. The ability to borrow abroad can thus dampen business cycles by relieving households and firms of the need to sharply compress consumption and investment spending and to thereby depress domestic demand, when domestic production and income turn down (see Greenwald, Stiglitz, and Weiss, 1984). By holding claims on foreign countries, households and firms can diversify risks associated with disturbances that impinge on the home country alone. Companies can protect themselves against cost and productivity shocks by investing in branch plants in several countries across which such shocks are imperfectly correlated. Capital mobility can thereby enable investors to achieve higher risk-adjusted rates of return. Income levels in recipient countries should also rise as a result of the capital inflows. Higher rates of return can encourage saving and investment that deliver faster rates of economic growth.24

In addition, by analogy to the case for free trade in goods, free capital flows allow the global economy to reap the efficiency gains created by specialization in the production of financial services. Some countries will find it more efficient to import than to produce financial services, in return for which they will export other goods or services. The fact that the production of many financial services, wholesale financial services in particular, is characterized by economies of scale and scope implies that their production will be concentrated in certain countries on efficiency grounds. Capital account liberalization can also promote the dynamic efficiency of the financial sector. Increased international competition in the provision of financial services can force domestic producers to become more efficient, stimulate innovation, and improve productivity.

A final argument for capital account liberalization, emphasized by Quirk and Evans (1995) and Cooper (1998), is that, with the growing difficulties of enforcement, policies designed to limit international capital flows will have to be increasingly invasive and distortionary in a world of highly developed capital markets.

Asymmetric Information

The classic case for unfettered capital markets is predicated on the assumption that they deliver an efficient allocation of resources. A large literature on “efficient markets” draws out the implications of this assumption. In contrast, those who emphasize the pervasiveness of information asymmetries dispute that this assumption is appropriate. Under the alternative assumption that information is asymmetric, inefficiencies can arise. These are the conse-

24 See Goldsmith (1969), McKinnon (1973), and Shaw (1973).

In theory, financial development can raise an economy’s growth rate in two ways: by increasing the rate of capital accumulation and by spurring technological innovation. The financial system can stimulate growth by facilitating the trading, hedging, diversifying, and pooling of risk; by enhancing the allocation of resources; by better enabling investors to monitor managers and exercise corporate control; by mobilizing savings; and by facilitating the exchange of goods and services (Levine, 1997). Obstfeld (1994a) provides a model of these relationships.

25 A synthetic treatment of these issues in the developing country context is Mishkin (1996).
Quence of three problems: adverse selection, moral hazard, and herding behavior.

Adverse selection can occur under asymmetric information because lenders have incomplete knowledge of borrower quality and borrowers who are bad credit risks have a strong incentive to seek out loans. When incomplete information prevents lenders from being able to evaluate credit quality, they will only be willing to pay a price for a security (or lend at an interest rate) that reflects the average quality of firms issuing securities (or applying for loans), where that price is likely to be less than the fair market value for high-quality firms but above fair market value for low-quality firms. Because the owners and managers of high-quality firms realize that their securities are undervalued (equivalently, their borrowing costs are excessive), they will not wish to seek financing on the market. The only firms that will wish to sell securities will be low-quality ones because they know that the price of their securities is greater than their value. Because high-quality firms will issue few securities, many projects with a positive net present value will not be undertaken, while other projects whose net present value is lower than the opportunity cost of funds will in fact be financed. Under these circumstances, a liberalized capital market will not deliver an efficient allocation of resources.

Moral hazard can occur under asymmetric information because borrowers can alter their behavior after the transaction has taken place in ways that the lender regards as undesirable. Borrowers will wish to invest in relatively risky projects in which they do well if the project succeeds but the lender bears most of the loss if the project fails; lenders, in contrast, will wish to limit the riskiness of the project. Hence, borrowers will attempt to alter their projects in ways that increase their risk after the financial transaction has taken place, and information asymmetries will facilitate their efforts to do so. Under these circumstances, many of the investment projects actually undertaken will be excessively risky. Lenders, as a result, will be reluctant to make loans, and levels of intermediation and investment will be suboptimal.

Finally, in financial markets characterized by incomplete information, lenders may be prone to engage in herding behavior, whereby they try to follow the lead of those whom they believe to be better informed. Such behavior gives rise to sudden market movements and volatility. Herding can be rational in the presence of information cascades, when agents optimally infer information from the actions of other agents and therefore act alike; in the presence of payoff externalities, when the payoff to an agent adopting an action increases with the number of other agents adopting the same action; and in the presence of principal-agent problems, under which investors managing money for others may have an incentive to "hide in the herd" in order not to be easily evaluated. Herding can arise when incompletely informed investors infer that a security is of lower (or higher) quality than previously thought from the decisions of other, presumably better informed, investors to sell (or buy) it. Such behavior can work to amplify price movements and precipitate sudden crises. Herding can also arise when investors are incompletely informed about the quality of those who manage their funds. Low-quality money managers may then find it rational to emulate the investment decisions of other managers in order not to be found out. Again, this could amplify asset price volatility. Finally, herding can be rational in the presence of payoff externalities, when the payoff to an agent adopting an action increases in the number of other agents adopting the same action. Obstfeld (1996) presents a model in which individual currency traders are too small to exhaust the central bank's reserves and force devaluation of the currency, but simultaneous sales of that currency by several traders can have that effect. Krugman (1996) shows how this payoff externality can result in herding behavior.


26A seminal theoretical treatment of this issue is Stiglitz and Weiss (1981). Whether additional liberalization will be beneficial, starting from an initial position where domestic or international financial transactions are restricted, depends on the precise nature and magnitude of the distortions involved. This is a question to which it is difficult to give general answers, although some of the most important issues are taken up below.

27Moral hazard in financial markets can also result from sources other than asymmetric information; as discussed further below, an important potential source of moral hazard arises from the possibility that investor behavior will be altered by the extension of government guarantees that relieve investors of some of the consequences of risk taking.

28Devenow and Welch (1996) summarize the literature on models of rational herding.

29Calvo and Mendoza (1997) provide a model—closely related to the arguments above—of how capital account liberalization and the globalization of securities markets can increase the extent of herding. Briefly, their argument is that globalization, by increasing the menu of financial assets available to investors and promoting portfolio diversification, at the same time reduces the returns to investing in acquiring information on individual assets and thereby aggravates the problem of incomplete information that encourages herding. The same phenomena arise in Bacchetta and van Wincoop's (1998) model of international capital flows in the presence of incomplete information and learning. But where Calvo and Mendoza argue that capital market liberalization, to the extent that it occurs simultaneously in many countries, undermines individual incentives to gather information and thereby permanently increases herding behavior, Bacchetta and van Wincoop argue that incomplete information is a transitional problem associated with recent liberalization (namely, that international investors will have the least information about recently liberalized markets), so that the problem should be overcome as learning takes place over time.
Beyond these theoretical analyses of herding behavior, a good deal of empirical research, in both domestic and international markets, suggests that asset prices fluctuate with more volatility than can reasonably be explained by economic fundamentals (see, for example, Shiller 1990 and 1993). Although these empirical results have been disputed, there is enough substance to be concerned about the issue even if herding behavior and other asymmetric information problems are not the full explanation. Moreover, economic fundamentals clearly do fluctuate and sometimes by large amounts. Experience as well as theory suggest that when these fluctuations coincide with weak financial systems, damaging economic and financial crises can easily be the result.

When adverse selection or moral hazard deters desirable transactions that would otherwise have occurred had information asymmetries been less severe, the result is economically suboptimal but relatively unlikely to be associated with important systemic risks. In other circumstances, however, adverse selection or, especially, moral hazard can potentially be associated with problems of systemic dimension. The most important problem in this area is almost surely the moral hazard created by extensive explicit and implicit government guarantees for financial institutions (and sometimes other types of enterprises), without adequate safeguards against imprudent risk taking by such institutions or adequate incentives for market discipline to effectively police excessive risk taking.

Herding behavior and the associated distortions to market dynamics are probably to some extent an intrinsic feature of most active financial markets, domestic and international. The key questions are how to recognize when these problems may become serious and how to contain or counteract them in these situations. Theory (and experience) provides no complete answers. In principle, better information about the buildup of an excessive concentration of debt and other sources of systemic risk should contain herding enthusiasms, perhaps partly by provoking earlier and less damaging corrections. Macroeconomic policies also have a role to play in resisting the buildup of systemically important imbalances in financial markets, as well as in countervailing the damaging effects of financial crises as the herd stampedes to the downside.

**Domestic Distortions**

Even when information is complete, international financial liberalization can be welfare reducing in the presence of domestic distortions. This result is a straightforward application of the theory of the second best.\(^{30}\)

A classic illustration is Brecher and Diaz-Alejandro (1977), who consider the effects of capital flows in the presence of trade distortions. They set out a model of a small, open, relatively labor abundant country that protects its capital-intensive industries; an example is a developing country better endowed with labor than capital that protects or subsidizes its motor vehicle and aircraft industries. Because protection of these relatively capital intensive industries boosts the rate of return to capital invested in the country, capital will flow in, leading capital-intensive sectors to expand and labor-intensive sectors to contract. At world prices, the value of domestic production declines, because the misallocation of resources between the capital- and labor-intensive sectors is magnified.\(^{31}\) Capital having flowed from higher-value uses abroad to lower-value uses in the capital-importing country, world welfare declines as well. Cooper concludes from this analysis that the "free movement of capital is likely to become allocatively efficient only after trade barriers have come down substantially, particularly barriers on capital-intensive activities in labor-rich countries" (Cooper 1998, p.13).

McKinnon and Pill (1997) apply a variant of this model to the case where policymakers subsidize or guarantee foreign loans to the domestic banking system.\(^{32}\) Government guarantees against the possibility of domestic bank failures encourage excessive capital inflows. If the domestic economy is relatively well endowed with labor, but the financial sector is relatively capital intensive, capital inflows will have the same income- and welfare-reducing effects described above.\(^{33}\)

**Summary and Implications**

This review suggests that the theoretical presumption in favor of the liberalization of domestic and international financial markets is weakened by the presence of asymmetric information and domestic distortions. Whether liberalization is welfare

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\(^{30}\) More generally, the applicability of the theory of the second best in the context of capital controls and capital account liberalization is discussed in Dooley (1996a).

\(^{31}\) Because labor and capital are attracted to the relatively low value added (at world prices) import-competing activity.

\(^{32}\) See also Mathieson and Rojas-Suarez (1993), Dooley (1996b), and Krugman (1998).

\(^{33}\) A final possible undesired effect of capital account liberalization is its distributional consequences. Theory suggests that increased international capital mobility raises the effective price elasticity of the supply of capital to any single national economy, making it more difficult to tax capital and shifting the incidence of taxation toward labor services (Rodrik, 1997). This effect is often referred to as the tendency for capital mobility to increase international tax competition, especially in capital taxation. National authorities may regard these distributional consequences as undesirable. The optimal response to this problem is not capital account restrictions, however, but lump-sum redistribution.
enhancing depends on the nature of those distortions, on the extent of information asymmetries, and on the severity of the adverse selection, moral hazard, and market inefficiencies that result. However, these problems are not a given, and public policy has the capacity to correct or ameliorate them.

For the domestic distortions discussed in the previous subsection that are fundamentally the result of misguided government policies, the solution is straightforward: correct the policies. In particular, if capital inflows threaten to reduce welfare because they will flow into heavily protected domestic industries where the true (social) return to capital is less than the cost of foreign borrowing, then eliminate or reduce protection to correct this distortion. After all, even without inflows of foreign capital, it makes no sense to invest large amounts of domestic capital in industries where the true rate of return is low or even negative. In some situations, government guarantees perform a desirable function. For example, modest amounts of sovereign borrowing to help finance investments in human capital, such as primary schooling and basic health care, can be justified as these are high rate of return activities for which, unfortunately, private market mechanisms work poorly. Financial guarantees for inefficient state enterprises that enable them to expand and waste more resources are a different matter. But such problems are not intrinsically problems of financial liberalization. Their cure is obvious and desirable regardless of the nature of the financial system; liberalization only makes the cure more urgent.

Some problems of asymmetric information can also be addressed reasonably directly through public policy, notably, policies that encourage adherence to world-class standards for accounting, auditing, and information disclosure; that facilitate enforcement of sound rules of corporate governance; and that protect investors and lenders from fraud and unfair practices (including through a credible judicial system and efficient bankruptcy procedures). Even when conditions are optimal, however, some problems of asymmetric information remain intrinsic to financial markets and institutions. When asymmetric information deters desirable transactions that would occur in an ideal world, financial liberalization is not able to produce all of the potential benefits relative to this ideal, but there is no threat of harm. When it encourages undesirable transactions that may be made easier in a liberalized system, the concern must be to limit the potential damage to an acceptably low level.

Theory alone provides little guidance on how to contain such dangers. It tends to send one chasing off after the phantoms of thousands of possible information asymmetries. Experience is a better teacher. While the continued development of financial markets, institutions, and instruments will probably turn up some new problems or new guises for old problems, experience points to the key issues that must be addressed to contain risks of serious misbehavior by liberalized financial systems. Strong, market-based incentives for prudent risk management by businesses and especially by financial institutions are critical. Because of their special character and place in the economic system, financial institutions must be subject to proper prudential supervision and regulation by an appropriate government agency. The government, usually the central bank, needs to be prepared to act as a lender of last resort to the financial system in the event of a systemic crisis. The government must contain the moral hazard associated with this activity by limiting such intervention to cases of systemic threat; by ensuring that financial institutions that make losses absorb them; and by imposing on shareholders, managers, and subordinated creditors the grief they deserve when an institution approaches insolvency. Macroeconomic policy needs to resist the buildup of serious financial imbalances and to counteract disorderly markets and limit economic contraction in a downturn. The public debt must be kept within reasonable bounds, and its maturity and currency structure must be prudently managed. Beyond the sovereign, excessive leverage, especially in the financial system but also in the business or household sectors, may be a cause for concern. Foreign currency debt may be a particular problem.

Notably, except for this last point, everything on the above agenda (including the points in the preceding two paragraphs) is as relevant for domestic financial liberalization as it is for capital account liberalization because the key potential problems with financial liberalization are germane to both its domestic and international dimensions. Yet, the presence of these problems has not led policymakers to suppress domestic financial liberalization and proclaim the virtues of highly repressive financial systems in their economies. Indeed, as discussed earlier, the clear trend has been toward domestic financial liberalization. The existence of information-related and other problems in domestic markets is clearly not perceived as sufficient justification to reverse this trend.

Although it does not lend itself to statistical analysis, this experience across a wide range of industrial and developing countries is probably the most important and powerful empirical evidence about the bottom-line questions of whether, on balance, financial liberalization generally and capital account liberalization specifically are beneficial. Countries that have successfully liberalized their financial systems domestically and internationally seek to preserve and develop these systems.
Countries that have temporarily lost access to international capital markets actively seek to regain it. Countries that have never enjoyed such access seek to acquire it. Even countries that have had some bitter experiences with financial liberalization are not in general moving back to financial repression. Rather, they seek to learn what went wrong so that they can correct it and thereby enjoy more of the benefits of financial liberalization with fewer of the risks. Against this powerful evidence from experience, it remains to be seen what a more statistical analysis can supply.
IV Macroeconomic Effects of Capital Account Liberalization

This section describes empirical studies of the link between capital account liberalization and macroeconomic performance. It emphasizes measurement issues and the need to recognize the endogeneity of controls, and reviews the statistical evidence on the macroeconomic effects of capital controls and capital account liberalization.

Measurement Issues

A significant obstacle to cross-country studies of capital account liberalization is the absence of a clear measure of the degree of liberalization and the intensity of controls. Most studies have relied on dummy variables constructed from information provided in the IMF’s Annual Report on Exchange Arrangements and Exchange Restrictions (International Monetary Fund, various issues). The most frequently used proxy is a bivariate index of restrictions on payments for capital transactions. Unfortunately, this variable does not measure the intensity of controls, and it primarily captures restrictions on capital outflows (because it refers to resident-owned funds only). To overcome the first shortcoming, some studies have also used information on separate exchange rates for some or all capital account transactions (multiple currency practices) and surrender of export proceeds, either separately or combined into a single index of the intensity of controls. A few studies (see, for example, Quinn, 1997; Tamirisa, 1998) have drawn on the information contained in the country-by-country descriptions of foreign exchange restrictions to construct more nuanced indices. Still others have used onshore-offshore or covered interest rate differentials to infer the effectiveness and intensity of controls (see Dooley 1996b for a survey). However, reflecting problems of data availability for many countries, measures based on interest differentials have been used mainly in studies employing high-frequency data for industrial countries. Most of them focus on the effectiveness of controls rather than on their determinants (see Appendix IV).

Determinants of Restrictions

The incidence of controls is not random. Insofar as countries with particular macroeconomic and financial characteristics are especially prone to adopt controls, there is the danger that observers may incorrectly interpret those characteristics as "effects" of controls, when in fact the causality runs in the other direction. It is thus important to analyze the decision to adopt capital account restrictions.

A limited number of studies taking a political economy approach have examined the conditions that make the maintenance of controls or the liberalization of the capital account more likely. Epstein and Schor (1992) are representative of this genre. Using dummy variables from the Annual Report on Exchange Arrangements and Exchange Restrictions for the Organization for Economic Cooperation and Development (OECD) countries, they find that restrictions on capital account transactions are more likely to be imposed in countries with strong left-wing parties and where the central bank is not independent. Alesina, Grilli, and Milesi-Ferretti (1994) and Grilli and Milesi-Ferretti (1995) adopt a similar measure of controls; the first study uses panel data for OECD countries, and the second considers a wider sample of industrial and developing economies. Both find that countries with a fixed or managed exchange rate, low per capita incomes, and high ratios of government consumption to GDP are more likely to maintain controls. Countries with more independent central banks and balanced current accounts are less...
likely to maintain such controls. Although their measure of the presence of controls does not capture the intensity of the policy, Alesina and Milesi-Ferretti (1995) show that the same results obtain when the capital controls dummy is replaced with a broader measure of restrictions, including multiple exchange rates, surrender of export proceeds, and current account restrictions.

Johnston and others (1998) construct a more detailed measure of controls that exploits the disaggregated information provided in the most recent issue of the Annual Report on Exchange Arrangements and Exchange Restrictions. They find that the intensity of capital controls is negatively correlated with economic development and positively correlated with the level of tariff barriers, the black market premium, and the volatility of the exchange rate. No attempt is made, however, to infer the direction of causality. Quinn and Inclán (1997) construct measures of financial openness that combine proxies for current and capital account restrictions and test for the importance of political and structural determinants of openness. They document the trend toward international financial liberalization and find that financial openness is higher in countries with more independent central banks and lower in countries with left-wing governments. Finally, Lemmen and Eijffinger (1996) use the onshore-offshore interest differential for 11 OECD countries to proxy for the intensity of controls and find that these are positively related to the domestic rate of inflation, the degree of political instability, and—somewhat surprisingly—the level of investment.

Macroeconomic Effects

A useful starting point for reviewing this literature is Eichengreen, Rose, and Wyplosz (1996b). These authors ask whether in a sample of industrial countries, there are differences in the behavior of key macroeconomic and policy variables in the presence or absence of capital controls. They separate periods of speculative turbulence, defined as episodes characterized by abnormally large declines in foreign exchange reserves, increases in interest rates, and/or a depreciation of the exchange rate, from tranquil periods. Differences between crises occurring in the presence or absence of controls are evident in the behavior of inflation, money growth, and trade imbalances, all of which are higher in crises occurring in the presence of controls. Such differences are even more noticeable for the observations from tranquil periods: greater real overvaluation, larger budget and trade deficits, and faster growth of money and credit are evident in countries with controls. These findings can be interpreted in two (not incompatible) ways: first, that capital controls have a significant impact on macroeconomic policies and outcomes; and second, that they are imposed to support, at least temporarily, policies that would be unsustainable under free capital mobility.

Other studies, while not distinguishing turbulent and tranquil periods, also focus on the effects of capital controls and liberalization on external variables, inflation, and growth. Johnston and Ryan (1994) test whether capital controls have significantly affected the level and composition of international capital flows in a sample of 52 industrial and developing countries in the 1980s and 1990s. They estimate the determinants of private capital flows and test whether there are differences between restricted and liberalized regimes. For industrial countries, they find that the dismantling of controls has been associated with significant changes in the volume and composition of private capital flows, but they find no evidence of such changes in developing countries, and attribute this last result to evasion.

Citing the experiences of the United Kingdom, Italy, New Zealand, and Spain, Bartolini and Drazen (1997a) and Labán and Larraín (1997) emphasize that the liberalization of outflows often increases inflows. Bartolini and Drazen (1997b) document the positive correlation between restrictions on outflows in developing countries and real interest rates in industrial countries: when industrial country interest rates decline, developing countries tend to remove restrictions on the capital outflows. This suggests that the liberalization of capital accounts in the 1990s has been sustained, at least in part, by the persistence of low interest rates in Japan and the United States.

Alesina, Grilli, and Milesi-Ferretti (1994) and Grilli and Milesi-Ferretti (1995) find that countries imposing controls tend to have higher inflation and greater seigniorage revenue but lower real interest rates. They do not find correlation between capital controls and the rate of economic growth, however. Similar results are reported by Rodrik (1998),

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36Unfortunately, the nature of the data limits the analysis to a pure cross section for 1996.
37This last correlation vanishes in the 1980s, however.
38A possible explanation is that capital controls keep domestic interest rates low, thereby stimulating domestic investment.

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who finds for a sample of developing countries that the average rate of economic growth during 1975–89 is uncorrelated with the number of years countries had capital controls in place.\(^{42}\) He makes no attempt to control for endogeneity of restrictions, although he argues that, insofar as capital account liberalization generally occurs in periods of good economic performance, the fact that no relation is found may even signal a negative underlying effect of capital controls on growth.\(^{43}\)

A limitation of all these studies is that the dummy variable for controls does not provide a measure of their intensity. As noted above, Quinn (1997) addresses this problem by constructing an index of financial and capital account openness for a set of 64 industrial and developing countries. After controlling for initial income, education, and political instability, he analyzes whether changes in this index and its components are correlated with economic growth. He finds a strong positive correlation between capital account liberalization and growth that is robust to changes in model specification. He also finds that capital account liberalization is positively correlated with the ratio of corporate tax revenue to GDP. However, a causal interpretation of these links is complicated by the fact that no effort is made to control for the endogeneity of capital account liberalization.\(^{44}\)

Tamirisa (1998) also constructs an index of the degree of capital account restrictions for the year 1996 and finds that capital controls act as a barrier to trade in developing and transition economies.

A final set of studies focuses on whether restrictions on capital mobility limit a country’s ability to smooth consumption when hit by shocks to income (see, for example, Backus, Kehoe, and Kydland, 1992; and Obstfeld, 1994c). Lewis (1996, 1997), for example, tests whether official restrictions on international capital mobility help explain the lack of international risk sharing.\(^{45}\) Her tests are based on the idea that co-movements in consumption and output should be stronger in countries with tighter restrictions on capital flows, because residents of these countries will find it more difficult to smooth shocks to income by borrowing and lending internationally.\(^{46}\)

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Box 4. Financial Development and Growth

A crucial issue in analyzing the link between financial development and growth is measuring financial development itself. Among the measures used in the literature are the ratio of liquid liabilities of the financial system to GDP, the ratio of gross claims on the private sector to GDP, and the share of domestic credit intermediated by deposit banks.\(^1\) Studies focusing on the role of liquidity have also used the “value-traded ratio” (the ratio of total value of shares traded on a country’s stock exchanges to GDP) and the turnover ratio (the total value of shares traded on a country’s stock exchanges divided by stock market capitalization) (Levine and Zervos, 1998).

These studies generally conclude that there exists a strong link between financial development and growth (see Levine, 1997, for a survey.) This result is robust to different ways of measuring financial development and holds after initial income, human capital, measures of monetary, trade, and fiscal policy, and political instability are controlled for. Establishing the direction of causality is problematic, however, because financial development is itself affected by economic performance. King and Levine (1993a) adopt a post hoc, ergo propter hoc approach to this problem, confirming that financial development in a particular year is a good predictor of growth performance in subsequent years. Rajan and Zingales (1998) compare growth performance in sectors subject to different degrees of dependence on external finance. If finance stimulates growth, then finance-dependent sectors should grow relatively fast in countries where financial development is more advanced.\(^2\) They find evidence that sectors relying more heavily on external finance do indeed grow faster in countries with more developed financial systems.

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\(^{41}\)After controlling for growth determinants such as initial income, the level of education, and the size of government.

\(^{42}\)After controlling for other growth determinants, among which is the quality of government institutions.

\(^{43}\)Rodrik also reports no (conditional) correlation between the number of years capital controls were in place and either the investment rate or the rate of inflation. A possible reconciliation of this last finding and those of Grilli and Milesi-Ferretti (1995) is that the impact of capital account liberalization on the rate of inflation is stronger in time series than in the cross section. This again raises the issue of endogeneity insofar as controls tend to be imposed or strengthened in periods of economic distress when growth is declining and inflation is rising.

\(^{44}\)Clearly, more research is needed to establish the generality of these results. Nevertheless, this study suggests that, to detect an impact of capital account liberalization on economic performance, one must move beyond binary dummy variables and construct measures that proxy, however imperfectly, the intensity of capital account restrictions.

\(^{45}\)While all these measures have shortcomings, more detailed measures of financial development are not available for enough countries.

\(^{46}\)At the same time, it is less likely that fast growth in these sectors is inducing financial development, and therefore the endogeneity problem in the estimation is reduced.

\(^{46}\)Theoretical work by Obstfeld (1994a) and others suggests that the potential welfare gains from international risk sharing can be very large.
tionally. She confirms that consumption and output growth co-vary more strongly in countries with restrictions on international capital flows than in countries without them and that these results hold for different foreign exchange restrictions individually (capital controls, surrender of export proceeds, and so forth). This finding suggests that consumers in countries with extensive international restrictions tend to be more liquidity constrained than consumers in countries with weaker international restrictions.

Qualifications and Implications

These studies provide useful insights into the consequences of capital account liberalization. At best, however, they provide mixed support for the hypothesis that capital account liberalization has a positive impact on economic growth. Existing studies provide weaker evidence of a positive effect on growth for capital account liberalization in particular than for financial development more generally. (On the effects of financial development generally, see Box 4 on page 19.)

It is important to bear in mind several reasons why one might want to be cautious in drawing strong conclusions from these studies. First, insofar as existing studies have failed to fully sort out the direction-of-causality problem, the impact of capital account liberalization on growth may be disguised. Second, the dummy variables used in these studies may simply be too crude to capture the growth effects of capital account liberalization. Third, whereas the measures of capital controls used in these studies reflect mainly restrictions on capital outflows, much of the current policy discussion focuses on prudential measures likely to have their most immediate impact on capital inflows. In this respect, earlier empirical analyses may have only limited implications for the debate over the effectiveness of policies aimed at capital inflows.

Finally, the discussion so far says nothing about one potential macroeconomic effect of removing capital controls: the danger that liberalizing the capital account before the domestic financial system has been suitably strengthened can encourage volatile capital flows that create an environment conducive to the development of serious economic problems and, potentially, financial crises.

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46These tests are applications to international risk sharing of standard tests for the existence of liquidity constraints across consumers. See, for example, Campbell and Mankiw (1989) and Zeldes (1989).

47As mentioned earlier, Rodrik (1998) argues that insofar as liberalization is associated with faster growth, simultaneity bias, to the extent that it remains, reinforces the skeptical view.

48As already mentioned, these dummies do not provide a measure of the intensity of controls.

49See, for example, Folkerts-Landau and Ito (1995). Both these considerations point to the need for complementing the research surveyed in this section with a careful study of recent experiences of countries with and without restrictions on capital inflows (see, for example, Calvo, Leiderman, and Reinhart, 1993; Schadler and others, 1993; and Fernández-Arias and Montiel, 1996).
V  Capital Account Liberalization and Crises

This section seeks to shed light on the association of financial liberalization with financial crises.

Channels of Transmission

The recent literature (reviewed in Appendix III) features a profusion of models designed to elucidate the dynamics of currency and banking crises. What is relevant here is how domestic and international financial liberalization, if not supported by consistent and rigorous prudential supervision and regulation and appropriate domestic macroeconomic policies, heights the risk of crises. Domestic liberalization, by intensifying competition in the financial sector, removes a cushion protecting intermediaries from the consequences of bad loan and management practices. It can allow banks to expand risky activities at rates that far exceed their capacity to manage them. It can allow banks gambling for redemption to pursue risky investment projects and use expensive interbank funding. By granting banks access to complex derivative financial instruments, it can heighten the difficulty of evaluating bank balance sheets and stretch the capacity of regulators to monitor, evaluate, and limit risks.

External financial liberalization, operating through parallel channels, can have an even more dramatic tendency to amplify the effects of policy distortions and agency problems. By allowing the entry of foreign banks, external liberalization, like its domestic counterpart, can squeeze margins and remove domestic banks' cushion against loan losses. Like domestic financial liberalization, it can facilitate gambling for redemption, in this case by offering access to elastically supplied offshore funding and by allowing access to risky foreign investments. A currency crisis or unexpected devaluation can undermine the solvency of banks and bank customers who have been allowed by external financial liberalization and lax regulation to accumulate large unhedged foreign exposures.

These are all channels through which asymmetric information and policy distortions can give rise to crises—with special violence and force when the financial system has been liberalized. But two points about these dangers require special emphasis. First, the mechanisms through which internal and external financial liberalization can expose threats to financial stability are largely the same. Both internal and external liberalization squeeze margins and leave less leeway for poor loan and management practices. Both give banks and other intermediaries additional access to risky investments. Both give banks gambling for redemption access to additional sources of expensive funding. There is nothing unique or different about external financial liberalization in this context.

Second, it is not the financial liberalization that is at the root of the problem but rather the inadequacy of prudential supervision and regulation, whose consequences are simply magnified by liberalization. The goal of prudential regulation is to get banks (and other participants in financial markets) to recognize the risks they are taking. It is the inadequacy of prudential regulation that allows financial institutions to expand risky activities faster than they are able to manage them. It is the inadequacy of prudential regulation that allows banks and bank customers to accumulate dangerous unhedged exposures. It is the inadequacy of prudential regulation (and the absence of a coherent exit policy) that encourages distressed banks to gamble for

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50 The willingness and capacity of banks to undertake excessive risks may be exacerbated by the existence of explicit or implicit government guarantees.
51 The Korean banks' investments in Russian GKO's and Brazilian Brady bonds spring to mind.
52 Moreover, capital account liberalization, by tightening the link between domestic and foreign interest rates, can force the authorities to hike interest rates even more dramatically to defend a currency peg under attack, something that they may be unwilling to do when the condition of the banking system is already fragile. Thus, external financial liberalization increases the scope for lack of confidence in the banking system and lack of confidence in the currency peg to feed on one another in a vicious spiral.
53 And to allow the authorities to gather information on threats to systemic stability and on the need to take appropriate corrective measures (see Section VI).
The Special Problem of Short-Term Debt

Financial problems can result from the mismanagement of virtually any financial transaction. They can be associated with any entry on the asset or liability side of the balance sheet. But recent experience suggests that short-term debt poses special problems for the maintenance of financial stability.

The most serious problems with international capital movements occur when capital suddenly flows out of a country, precipitating a crisis. Although the sudden capital outflows associated with a crisis can in principle affect all forms of capital—debt, portfolio equity, and even direct investment and real estate investment—the macroeconomic consequences are most disruptive when they involve debt, especially debt of the sovereign and of the banking and financial system. Outflows from sovereign debt markets that precipitate a sovereign default disrupt the international financial relations of the entire economy. Default by much of the banking system is also disruptive, given that the banking system is at the center of a country’s payment and financial system. The threat of such disruptions in turn impels the sovereign to jump in and guarantee bank debt, thus raising the risk of sovereign default. Although defaults by individual enterprises on foreign currency debts are not generally a problem (except for the enterprises concerned), large-scale defaults by much of the corporate sector—which tend to be triggered by a large devaluation—can be very disruptive, especially insofar as they threaten the stability of the banking system. In contrast, outflows of equity capital have their most immediate impact on asset prices and on the capital gains taxes for a significant share of its revenue. The impact of declining equity prices on bank balance sheets and the fiscal position will be less immediate than the effects of a shift in sentiment against short-term foreign currency debt.

The risks from short-term debt are best controlled at the source. The sovereign can, and should, control its own borrowing. The financial system should be soundly managed and regulated. Corporate borrowers need to recognize and manage risks appropriately, and a strong system of corporate governance will strengthen the incentives for management to do so. While there may be a case for policies designed to avoid excessive reliance on short-term debt denominated in a foreign currency, at the core of an effective strategy to address this problem should be sound financial management and prudential regulation.

Flexibility in the exchange rate can also discourage excessive reliance on short-term foreign borrowing. Recent experience points to a series of episodes where both lenders and borrowers perceive an exchange rate peg as a link in a chain of implicit guarantees. In these circumstances, the high nominal interest rates characteristic of emerging markets can lead to very large short-term capital inflows. The exchange risk associated with greater nominal exchange rate flexibility can play a useful, if limited, role in moderating the volume of these short-term flows. It can encourage banks and firms to hedge their short-term foreign exposures, insulating them from the destabilizing effects of unexpectedly large exchange rate movements. However, greater exchange rate flexibility is not a panacea; if introduced without advance planning and in a setting where banks and corporations have heavy debts denominated in foreign currency, its effects can be destabilizing. But if the authorities take advantage of a period of capital inflows to introduce greater flexibility so that the rate begins its more flexible life by strengthening, the beneficial effects are likely to dominate.57

54In addition to the ongoing task of supervision and regulation, measures to address financial and organizational restructuring of major banks may be needed in some cases to remove the incentive to gamble for redemption.

55These links are not inconsequential, especially when universal banks hold equity stakes in the firms to which they extend loans or provide considerable quantities of margin credit to stock market investors, and when the government relies on income and capital gains taxes for a significant share of its revenue. The impact of declining equity prices on bank balance sheets and the fiscal position will be less immediate than the effects of a shift in sentiment against short-term foreign currency debt.

56The operation of these forces is evident in the 1992–93 European currency crisis, in the literature in which they were labeled “convergence trade.” See Goldstein and Folkerts-Landau (1993). In the literature on the Asian crisis they are referred to as the “carry trade.” See Adams and others (1998).

57On exit strategies for countries seeking greater exchange rate flexibility, see Eichengreen and Masson (1998).
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Over and above these measures, there may be a role for prudential measures designed to limit excessive dependence on short-term foreign currency debts.

Basic Principles

In a first-best world, banks and other financial market participants would have proper incentives to manage risk, and this would help avert a concentration of risks with the potential to endanger systemic stability. The tendency to take on excessive risk would be contained through the operation of market discipline, facilitated by the adoption of best-practice accounting, auditing, and disclosure standards. Public policy can help create the appropriate environment both by mandating the use of proper accounting, auditing and reporting rules for financial institutions and by taking care not to create a culture of implicit guarantees so that lenders face a significant loss of capital if they fail to assess credit risk prudently.

Where the techniques of risk management are not well developed, where auditing and accounting practices are inadequate, and where other distortions interfere importantly with banks’ ability to manage risk, there is a particularly important role for firm prudential regulation. The argument for prudential regulation is even stronger insofar as central banks and governments backstop financial markets, and their provision of a financial safety net encourages banks and other market participants to take on excessive risk. A century and more of historical experience points to the need, in most countries, for central banks to provide lender-of-last-resort services to prevent illiquid financial markets from seizing up in periods of generalized distress. As noted earlier, this backstopping function, though essential, is a source of some moral hazard. The appropriate response is rigorous prudential supervision and regulation combined with careful design of the lender-of-last-resort facility to limit the scope and incentives for financial market participants to take on excessive risk.

Problems of Definition and Design

In the industrial countries, prudential regulation of banks has been evolving from simple rules prohibiting or placing ceilings on certain types of investments and limiting assets to a certain proportion of capital, in favor of more complex regulations that attach different weights to different assets according to their risk and typically use sophisticated models to calculate the weights. Increasingly, banks are allowed to use their own proprietary models in deriving the weights. Overall, prudential regulation appears to be shifting toward broad oversight of institutions’ capacity to manage risks and away from narrow administrative measures.

The complexity of this new approach pushes the envelope of competence for bank regulators and managers even in the countries with the most ad-
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advanced financial markets. The point applies with even more force in emerging markets. Insofar as this is the case, there is an argument for continuing to rely on simple rules, at least until the expertise is in place to implement more demanding approaches.

Where some of the relevant risks are associated with excessive reliance on certain categories of capital account transactions, this is an argument for containing those risks through the imposition of capital, liquidity, reserve, and open position requirements that take into account the systemic-risk implications of all the entries on the asset and liability sides of bank and nonbank firms' balance sheets and specify optimal risk weights for each item. Regulators have traditionally distinguished between open position limits and differential capital requirements on the one hand—which are generally regarded as prudential measures, and as consistent with the Basle Core Principles—and differential reserve requirements on the other, which have traditionally been regarded as devices to enhance monetary control. While it may be tempting to dismiss the point as a semantic one, it highlights a substantive issue—namely, that policymakers wishing to limit capital account transactions for other reasons (to reconcile otherwise incompatible internal and external macroeconomic objectives, for example) may invoke arguments based on prudential regulation as cover for policies otherwise at variance with their stated goal of capital account liberalization. Given that these types of policies typically have complex consequences, there is no easy way to determine which policies have a primarily prudential objective.

In fact, policies to contain the risks associated with capital flows have been designed and implemented in a variety of ways. Some countries differentiate reserve requirements according to both the residency and currency of the denomination of deposits, while others differentiate them on the basis of the currency of denomination but not residency. In still other cases, prudential measures have been keyed to banks' open net foreign currency positions, a net open position being the difference between unhedged foreign currency assets and liabilities (in principle, comprising both net spot—balance sheet—and forward—off-balance sheet—positions), typically as a percentage of the bank's capital base. In Chile, the Czech Republic, Egypt, Hungary, India, Poland, and Turkey, the open position limit is symmetric (that is, it applies to the sum of short and long positions), whereas in Argentina, Brazil, Korea, Malaysia, Peru, the Philippines, and Thailand, it is asymmetric (different limits are applied to short and long positions).

The assumption underlying the imposition of differential reserve requirements or ceilings on open positions according to the term of the position or the residency of the claimant is often that short-term claims and claims of nonresidents are more volatile than the long-term claims of residents, justifying stronger prudential measures. As an empirical matter, the accuracy of this assumption is not clear. Postmortems on several emerging market financial crises have suggested that domestic residents contributed importantly to the short-term capital outflows that occurred in the run-up to the crises in question.

Some authors also question whether short-term capital flows are more volatile than long-term flows (see, for example, Dooley, 1996c). But even if short-term flows into the banking system are no more volatile than longer-term foreign investments on average, they have the greatest capacity to move out of the country in response to a sudden loss of confidence. Given the fragility of the banking system and its vulnerability to runs (especially given the limited capacity of the central bank to provide lender-of-last-resort support when it is simultaneously committed to defending the exchange rate), there is an argument for applying differential capital and reserve requirements and ceilings to short-term flows through the banking system as a form of insurance.

Since nondiscriminatory treatment of market participants is in general desirable, it is important to be clear as to why special measures toward banks might be contemplated. Banks are special in that their role as delegated monitors (on behalf of the holders of bank liabilities and equity) causes their balance sheets to be heavily loaded with claims on borrowers...
whose affairs are difficult for nonbank lenders to evaluate. That is, asymmetric information in the market for these claims can be relatively severe. Consequently, were banks forced to engage in distress sales of these assets, they could do so only at a significant loss. Combine this with the demandability of bank liabilities and the interdependence of individual banks (which are linked through, among other vehicles, the interbank market), and there is reason to think that a few important bank failures can cascade throughout the banking system, threatening the viability of the payments mechanism. This concatenation of risks is why governments and central banks provide a financial safety net to banks (and not, for example, to insurance companies and hedge funds). And given that banks enjoy the protection of a safety net, it follows that there is justification for targeting them with special prudential measures.

The same type of argument provides the basis for special measures toward banks’ foreign currency exposures and short-term foreign currency exposures in particular. Given that the domestic lender of last resort cannot print the foreign currency needed to backstop the market when banks with net open foreign currency positions experience distress, such exposures may be a special source of systemic risk. There is then an argument for limiting them on grounds of systemic stability.

The effectiveness of these measures in limiting the systemic risk associated with positions in foreign currency-denominated assets and liabilities has varied. Lack of transparency and inaccurate reporting of effective foreign asset positions (failure to report exposures associated with positions in derivative instruments, for example, and with positions in instruments containing explicit or implicit put or call options) can and sometimes have robbed these measures of their effects. Policymakers must avoid the tendency to think that they have solved the problem simply by putting measures on the books, without due vigilance to implementation (transparency and accuracy of reporting, in particular).

Leaving aside issues of transparency and accuracy of reporting, a problem with symmetrical open position limits (on the difference between banks’ foreign currency liabilities and assets) is that such regulations can give banks an inappropriate incentive to make foreign currency–denominated loans to onshore customers in order to match the currency denomination of their assets and liabilities. In addition, limiting the ability of banks to borrow abroad (by imposing position limits) or raising the cost of doing so (by applying differential reserve, capital, and liquidity requirements) may simply encourage nonbanks to do the borrowing for them. Corporates could borrow offshore in foreign currency and deposit the proceeds with domestic banks, which, their access to external funding restricted, would be inclined to offer relatively attractive deposit rates; the banks could then onlend the proceeds to their domestic customers. If corporates hedge their exposure by making foreign currency–denominated deposits, the banks will effectively end up with the same short-term foreign currency exposure as when there were no limits on their ability to fund themselves abroad. Assuming no change in the pressure on the authorities to provide the banks with guarantees, foreigners will have the same incentive to supply short-term foreign currency funding, because there will still be little question about their ability to get their money back. The vulnerabilities to which the financial system is subject will then be essentially unchanged.

The logical implication of these issues is that proper prudential regulation of the banking system with respect to exposure to foreign currency risk needs to be concerned with total, direct and indirect, exposure to such risk. The question that must be addressed is, how would the banking system be affected in the event of a major (unanticipated) change in the exchange rate or an interruption of access to foreign currency credit, taking account of effects through the banks’ own balance sheet and...

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64 On banks as delegated monitors and the connection of this concept to the notion of asymmetric information, see Box 1.
65 The distinction between banks and nonbank financial institutions in terms of prudential policy could be further nuanced to allow for the fact that, nationally as well as internationally, increasing attention is being paid to the systemic implications of activities undertaken by securities and insurance firms, especially when they are part of a financial conglomerate.
66 Such measures can be thought of as nondiscriminatory because the country in whose currency the claim is denominated is not ultimately the basis for the differential treatment, but rather the implications of the attributes of that claim for systemic stability.
67 One might well ask why banks choose to hold domestic rather than foreign investments in order to close their open positions. One possible answer is that there exist other distortions affecting interest rates and exchange rates that provide an incentive for domestic rather than foreign investment. But the asymmetric information perspective suggests that domestic banks have a comparative advantage in acting as delegated monitors of domestic customers.
68 If, however, corporations made domestic currency deposits, they would assume the foreign exchange exposure and be subject to similar insolvency risk from exchange rate changes as the banks in the scenario that involves no restrictions. It seems likely that the authorities that had previously felt impelled to extend guarantees to the banks would now extend similar support to nonbanks, having induced the latter to take on financial intermediation responsibilities.
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off-balance sheet positions, as well as through the consequences for bank borrowers and even possibly for depositors and other creditors of banks. As the experiences in Mexico in 1995 (Goldstein and Turner, 1996), in Thailand in 1997 (Folkeerts-Landau, 1997), and in Indonesia in 1998 amply demonstrate, banks can get into deep difficulties when their borrowers (in either domestic or foreign currency) are forced into insolvency or near insolvency by large foreign currency exposures in the face of massive depreciation of the domestic currency. Also, although this has not typically been a critical problem, the sudden withdrawal of foreign currency deposits to meet the foreign currency obligations of depositors in a crisis could put banks in difficulty unless they hold substantial and highly liquid foreign currency assets (with foreign currency claims against domestic borrowers not generally falling in this category). Prudential regulation and supervision of a banking system that effectively takes account of, and effectively controls, all of these direct and indirect channels of vulnerability is no easy task, especially when banks and nonbanks may not fully comprehend the risks to which they are exposed and may have strong incentives to evade prudential restraints in pursuit of perceived profit.

An alternative, or supplementary, approach to dealing with this prudential problem for some countries (especially where sound banking and bank regulation are not highly developed) might include broader efforts to discourage potentially destabilizing forms of capital flows through some form of tax or tax-equivalent measure applied generally to foreign currency borrowing (and other equivalent position taking). If it is intended to target short-term capital inflows on the grounds that these are a special source of systemic risk, the policy could be structured as a holding period tax—for example, like the Chilean measure, which requires that all nonquity foreign investment be accompanied by a one-year, non-interest-bearing deposit (whose tax equivalent therefore declines with the duration of the investment). Fischer (1998) and Mussa (1998) take this argument to its conclusion, suggesting that prudential regulation in the face of international financial liberalization should address threats not only to the stability of the banking system but also to financial stability created by the assumption of large volumes of short-term debt, particularly that denominated in foreign currency, not just by financial institutions but also by firms and the sovereign. Exposure to short-term foreign currency debt should be monitored because of the limited ability of debtors to avoid default on such obligations under adverse circumstances and because of the serious financial and economic disruptions that accompany such defaults. The high liquidity of short-term debt makes self-fulfilling debt runs a potential danger, and, unlike the situation with debt denominated in domestic currency, with debt denominated in foreign currency the central bank cannot backstop the market (because it is unable to print foreign exchange). As noted above, default by the sovereign, by much of the banking system, or by much of the business sector can destabilize the banking system and disrupt the economy. Hence, there may be a justification for extending the standard arguments for prudential supervision and regulation beyond the short-term foreign currency exposure of the banking system at least to the monitoring of other short-term flows, and perhaps to tax-like measures to discourage excessive exposure for the economy as a whole.

At the international level, there is also the issue of what might be done to lessen the risks of destabilizing international capital flows on the side of the suppliers of such flows. This issue is beyond the scope of this paper, but two suggestions are particularly relevant. First, the effort to improve data on flows of international credit from (and through) major international capital markets to emerging market countries should alert both lenders and borrowers to possible risks arising from excessive concentrations of debt, especially short-term debt. Second, consideration of whether risk weights applied to interbank lending by major international banks to emerging market counterparts accurately represent true economic risks might lead to more prudent behavior on the lenders’ side that will lessen the danger or extent of future international financial crises. In the end, it must be recognized that, as global financial integration inevitably deepens, an efficiently functioning international financial system will become ever more important to the welfare of all participants, and the adoption of measures that will lessen the risk and potential severity of financial crises will be in everyone’s interest. Moreover, long experience teaches that no financial system achieves perfection and that costly disruptions and occasional crises are, to some degree, unavoidable; it is therefore clear that serious attention must be given to the adequacy of international mechanisms for managing crises and containing their damage when they do occur.

Sequencing

The optimal sequencing of capital account liberalization is complicated. The essential caveat in any discussion of sequencing is that different countries’
situations vary greatly—in their levels of economic and financial development, in their existing institutional structures, in their legal systems and business practices, and in their capacity to manage change in a host of areas relevant for financial liberalization. Accordingly, there is no generally applicable cookbook recipe for the sequence of steps to undertake in financial and capital account liberalization, and there is no general guideline for how long the process should take. Presumably, a country with a fully liberalized domestic financial system that already had in place the safeguards necessary to ensure its successful operation could proceed almost immediately and with confidence to full capital account liberalization. However, this advice generally applies to countries (mainly the industrial countries) that already have quite liberal policies toward international capital. Maintaining tight restrictions on virtually all forms of international financial flows until the domestic financial system is fully and successfully liberalized is generally not an advisable strategy. Domestic and international liberalization can benefit from symbiotic interactions, but one needs to be careful about perverse interactions, particularly if opportunities made possible by international liberalization get ahead of relevant domestic preparations. Where domestic preparations are well advanced, essentially full international liberalization should be able to proceed relatively rapidly, say, within a decade or so for the more advanced emerging markets. Where the essential infrastructure for a liberal and stable financial system is not well developed, full liberalization, both domestic and international, will generally require more time if safety and ultimate success are to be reasonably ensured. Even with a gradual and prudent approach, there are likely to be bumps along the road. Bumps are not all bad. Learning to deal with them is one of the most important steps in building a liberal, open, and stable financial system.

With this caveat in mind, a few general principles can usefully be stated. First, the discussion in this paper has focused primarily on capital inflows and on the problems that arise when inflows are rapidly reversed in a crisis. Because banking systems play a central role in the financial affairs of most emerging market countries, liberalization of capital flows to and through the domestic banking system is already a significant reality in many of these countries. This is especially so for countries where domestic financial markets are little developed beyond the banking system and where there has been understandable enthusiasm to access the opportunities provided by world financial markets. Reversing this situation by going back to detailed restrictions on capital flows through domestic banks hardly seems sensible. Moreover, even for countries like China, where opening to direct foreign investment has preceded broad opening to flows through domestic banks, liberalization changes the environment in which banks operate at an early stage. Thus, in general, the most important point to recognize in sequencing reforms in conjunction with capital market liberalization is the danger of removing most restrictions on capital account transactions before major problems in the domestic financial system are addressed.

Among the problems that plausibly fall under this heading are inadequate accounting, auditing, and disclosure practices in the financial and corporate sectors, which weaken market discipline; implicit government guarantees, which encourage excessive, unsustainable capital inflows; and inadequate prudential supervision and regulation of domestic financial institutions and markets, which create scope for corruption, connected lending, and gambling for redemption. Countries in which these problems are severe, but that choose to suddenly and fully open the capital account nonetheless, run the risk of incurring a crisis. The implication is that countries should liberalize the capital account gradually, at the same time that they make progress in eliminating these distortions. Given the particular concerns associated with short-term foreign debt discussed above, there may also generally be a case for liberalizing longer-term flows, particularly foreign direct investment, ahead of short-term capital inflows.

Second, as a corollary, it is usually a mistake to liberalize the domestic banking system or to open it fully to international capital inflows if important segments of the system are insolvent (on an accurate accounting basis) or are likely to be pushed into insolvency by liberalization. As a general rule, it is desirable to weed out nonviable institutions and put remaining banks on a sound managerial and financial footing (and do the other things mentioned above) before liberalizing or opening the domestic banking system. When the domestic banking system is weak, opening it to competition from foreign banks, either through acquisition of domestic banks or startups of new institutions, is a delicate matter. Some reasonable amount of opening can provide valuable examples and help spread good banking practices and can also introduce useful competitive pressure for reform of domestic banks. Placing too much pressure suddenly on a weak domestic system, however, can provoke a crisis that, while it can sometimes speed reform, can also prove difficult to contain.

Third, while foreign direct investment sometimes raises concerns about foreign ownership and control, considerable evidence points to the economic benefits associated with such investment, including transfer of technology and of efficient business practices. Also, volatility in flows of direct investment does not appear to generate the same acute problems of fi-
financial crises associated with sharp reversals of debt flows. Thus, liberalization of inward direct investment should generally be an attractive component of a broader program of liberalization. Liberalization in this area need not occur all at once; for countries that face the prospect of large surges of inward investment, a gradual approach may be advisable. Also, from a macroeconomic perspective, it generally makes little difference if foreign investment is limited in some selected sectors of the economy for national security or other reasons. The financial sector, however, is an important exception. It may be argued that opening the domestic financial markets to participation by foreign (or multinational) financial institutions is an integral element of full capital market liberalization; and important benefits can accrue from diversifying risks, especially for smaller countries, which is made possible when banks can operate across national boundaries.

Fourth, with respect to liberalizing portfolio investments in domestic equities and debt instruments, there is the problem that the domestic markets for these assets and the necessary financial infrastructure for such markets (accounting practices, bankruptcy procedures, securities laws, and so on) are not well developed in many emerging market countries. This is especially true for corporate debt, mortgage instruments, and obligations of subsidiary governments or public investments (such as toll roads or water projects). Development of the relevant domestic markets and their essential infrastructure is necessary if these markets are to be opened internationally, although international opening can promote the development of domestic financial markets (particularly through the participation of experienced institutions). And, the economy can clearly benefit from the development of domestic financial markets that allow financial flows to be less heavily dependent on the banking system (Miller, 1998).

Fifth, concerning liberalization of capital outflows, international capital markets that provide wide opportunities for investors, risk hedgers, and speculators already exist and are comparatively easy to access once restrictions are removed (and often before restrictions are removed). The main concern with outflow liberalization arises when the restrictions to be removed are supporting either a significant macroeconomic disequilibrium or a highly distorted financial system. If an overvalued exchange rate has been maintained with the aid of outflow restrictions, then one must be prepared to adjust the exchange rate when restrictions are removed, with the black or gray market rate providing an indication of the degree of the required adjustment. Similarly, if financial repression has kept interest rates for savers artificially low, one must be prepared for a rise in rates when capital account restrictions supporting such repression are removed. Effects are likely to be felt in the government budget from debt-service costs and in the profits of enterprises and financial institutions that have been the beneficiaries of financial repression. Enterprises and institutions that looked solvent under the old regime may suddenly appear quite shaky. To avoid costly accidents, countries are advised to liberalize outflows after they have reduced macroeconomic disequilibria and financial distortions to manageable proportions.

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70Although liberalization of trade in financial services is treated as a trade policy issue under the auspices of the World Trade Organization (see Dobson and Jacquet, 1998, for an analytical appraisal), it is one with potentially important macroeconomic implications that need to be clearly recognized.
VII Global Interest in Prudent Capital Account Liberalization

This paper has reviewed analytical issues and economic policy considerations that arise in conjunction with capital account liberalization. Since financial transactions are properly thought of as intertemporal trade, the same arguments that create a presumption in favor of current account convertibility to promote trade in different goods at a point in time create a presumption in favor of capital account convertibility to promote trade in the same goods at different points in time. In particular, impending changes in the age distribution of national populations mean that international capital flows between mature and emerging markets can yield especially important benefits on both sides.

Insofar as domestic distortions prevent the full gains from trade from being realized or even lead international capital flows to have perverse, welfare-reducing effects, the implication is again analogous to that found in the literature on trade policy: the first-best response is to eliminate the domestic distortion at its source, and not to restrict capital flows. This is an argument for prudent, carefully sequenced capital account liberalization, where controls on international financial flows are removed only following significant progress toward the (otherwise desirable) elimination of domestic distortions, not an objection to capital account convertibility itself.

The deeper concerns about capital account convertibility rest on information asymmetries intrinsic to financial markets. Domestically, it is generally accepted that asymmetric information provides a justification for regulation and supervision of financial intermediaries to limit risks to the capacity of banks to absorb adverse outcomes—especially adverse outcomes that rise to the level of systemic threats. If, for example, banks are unable to rapidly liquidate their assets at close to their full value, then bank runs may lead to severe liquidity problems and possibly bank failures with systemic implications; prudential regulations are therefore used to limit unhedged positions in the assets in question. If asymmetric information encourages herd behavior that results in sudden asset price movements, changes in financial flows, and even financial crises, there is in principle an argument for government intervention to inhibit or countervail such behavior if effective means of intervention can be identified. This applies to interventions to resist potentially destructive behavior both in domestic financial markets and in international or cross-border financial relations.

Sound management by the banks themselves is of course crucial to financial stability, but even the best bank managers are not expected to take into account all the systemic—as opposed to bank-specific—implications of their actions. Thus, there is a role for supervision and regulation, especially where problems of asymmetric information are most severe. And where the adverse selection, moral hazard, and excessive risk taking to which asymmetric information gives rise result in (long or short) positions in certain foreign assets that are excessive from the point of view of systemic stability, there may be a case for using taxes and instruments with taxlike effects (differential capital requirements, nonremunerated deposit requirements) to discourage undue reliance on the relevant category of capital account transactions.

Thus, the problem for policymakers seeking to benefit from capital account liberalization is to determine into which category problems afflicting the domestic economy fall. To the extent that the problem is a distortion that can be corrected, the solution is to properly sequence capital account liberalization by removing that distortion at the same time, or before, the capital account is liberalized. Domestic financial market distortions caused by the inadequate harmonization of tax policy, shortcomings in bank supervision and regulation, and implicit or explicit government guarantees of private sector liabilities all belong in this category.71

Some information problems fall under this heading as well—for example, problems created by inadequate accounting and auditing practices, inadequate reporting of the short-term foreign liabilities of the private sector, inadequate reporting of the contingent liabilities of the public sector, and inadequate transparency of government policy generally all create information asymmetries that can be attenuated (albeit not necessarily eliminated) if governments adopt internationally recognized standards of financial best practice and comply with the IMF’s Special Data Dissemination Standard. In addition, there is the incentive for markets themselves to solve these problems. The appearance of credit rating agencies, for example, can be seen as an attempt by the market to solve informational problems.
But to the extent that the problem is information asymmetries that are intrinsic to the operation of financial markets, that cannot realistically be removed, and that give rise to significant systemic risks, this creates an argument for the permanent application of policies designed to influence the volume of certain types of financial transactions. If those policies are operationalized through the use of taxes and taxlike instruments that make their effect felt by altering relative prices, rather than through the use of administrative controls, there is no reason why they should be viewed as incompatible with the still-desirable goal of capital account liberalization.
Appendix I  Earlier Era of Capital Market Integration

The history of global economic integration is reviewed in the May 1997 World Economic Outlook. There it is shown that the post-World War II phenomenon of globalization may in many ways be viewed as the resumption of a trend observed a century earlier.

Measures of Capital Market Integration

The integration of financial markets before 1914 is evident in the magnitude of current account imbalances. Figure 3 shows five-year moving averages of the mean absolute value of the ratio of the current account to GDP over the last 125 years for 12 countries for which data are continuously available. These data suggest that external capital flows have not yet matched the levels reached before 1914. The net capital outflow from Great Britain reached 9 percent of GNP at its peak, and figures nearly as high can be observed for the other principal creditor countries—France, Germany, and the Netherlands. (By comparison, Japan’s and Germany’s current account surpluses peaked in the mid- to late 1980s at 4–5 percent of GDP.) Similarly, current account deficits persistently exceeded 10 percent of GNP in a number of the principal capital importers, Canada, Argentina, and Australia prominent among them. In recent years, these levels have been approached in developing countries only for short periods, and those periods have often been followed by difficult adjustments when deficits were eliminated or reversed.72 Before 1914, large current account balances were more persistent.73

Overall, then, the magnitude and persistence of prewar capital flows are impressive by today’s standards. That is, the correlation between domestic savings and investment rates, which should be low if capital mobility is high, was lower during 1870–1914 (Bayoumi, 1990) than after World War II (Feldstein and Horioka, 1980) and even in recent decades.74

Another indicator of market integration is interest parity. Deviations from real interest parity are shown in Figure 4, which plots the standard deviation of annual ex post real long-term bond yields for 12 countries from 1870 to 1994.75 Figure 5 shows comparable data for short-term securities (three-month bank bills) for four countries. Both figures provide clear evidence of capital market integration before World War I and in the most recent decade, bracketing a period of massive disintegration. On this basis, it is hard to see the recent period as unprecedented.

Explanations for Capital Market Integration

A number of factors help explain the magnitude of international capital flows in the pre-1914 period. One is policymakers’ commitment to stable monetary and fiscal policies, as manifested in the gold standard. The gold standard provided a signal that borrowers followed the same rules as lenders and hence were unlikely to default on their debts. Bordo and Rockoff (1996) evaluate this hypothesis for nine recipients of British capital during 1870–1914 and find strong evidence that countries on the gold standard paid lower interest rates on sovereign debt than those that adhered to gold periodically or not at all. Flandreau, Le Cacheux, and Zumer (1998) find sim-

72 See Milesi-Ferretti and Razin (1998a,b) for a tabulation and analysis of these experiences.
73 Statistical tests for Canada, Argentina, and Australia show that current account balances exhibit significantly more persistence before 1914 than today. Bordo, Eichengreen, and Kim (1998) compute the Phillips-Perron Zt statistic for the two periods as a measure of persistence. The same conclusion is reached for a larger sample of emerging markets in the two periods.
74 Taylor (1996) uses data for 12 countries from 1850 to 1992 and examines saving-investment correlations over successive decades. His estimated coefficient traces out an inverted “u” shape over time, as if capital markets were well integrated before 1914, ceased being so except in the short period during which the interwar gold exchange standard prevailed, and have again become gradually more integrated since the 1950s, with coefficients in the 1990s reaching the levels of the pre-1914 period.
75 The data are from Bordo, Eichengreen, and Kim (1998).
Figure 3. Selected Countries: External Capital Flows

(In percent of GDP; five-year moving average)

Note: Five-year moving averages of the mean absolute value of the ratio of the current account balance to GDP for Argentina, Australia, Canada, Denmark, France, Germany, Italy, Japan, Norway, Sweden, United Kingdom, and United States.

ilar results for a different panel of European peripheral countries, as do Sussman and Yafeh (1998) for Japan. Insofar as the gold standard proxied for fiscal rectitude and for adherence to similar norms among the capital recipient as well as the sender countries, the decline in lending after World War I may reflect a shift to less credible and consistent policies. The rise in international financial flows in recent years may be a consequence in part of developing countries’ renewed commitment to macroeconomic stabilization and reform.

A related determinant of the extent and persistence of British capital exports may be the fact that most British investment went to former colonies where the British heritage was strong. These countries (for example, Australia, Canada, and the United States) shared a common language, culture, legal system, and accounting system. British capital also went to countries like Argentina and Uruguay, where Great Britain had a strong commercial presence and considerable political influence, or to colonies directly under British control. The French also directed their lending to countries where they had political influence and cultural ties—for example, Italy, Spain, and Russia (see Fishlow, 1985, and Flandreau, 1998). In contrast, today’s capital recipients tend to be different in the above respects from the capital exporters, which may be less willing to maintain foreign investment in the face of adverse shocks.

A third explanation lies in the nature of the investment itself. Much of the capital flowing to the New World went to finance railroads and other infrastructure, which required a long-term commitment. Because the returns accrued only when the project was completed, it was costly to terminate early, rendering capital flows unusually persistent. Although there is considerable infrastructure investment in today’s emerging markets, it does not dominate to the same extent.

Moreover, insofar as prewar investment, and British investment in particular, was in traded-goods-related sectors—as emphasized by Fishlow (1985), it went into export-related infrastructure and natural-resource-related projects that in the normal course of events generated enough foreign exchange revenues sufficient to pay the money back—it did not give rise to balance of payments problems. And the fact that pre–World War I lending took place in an environment of relatively free multilateral trade allowed countries that engaged in significant amounts of external borrowing to expand their exports as needed to amortize those debts.

A final explanation for the large international capital flows before 1914 may lie in the flexibility of nineteenth century economies. Their markets were less structured and institutionalized, and adjustment was less constrained by policy and powerful interest groups. A shift in capital flows that implied the need to reallocate resources between sectors producing traded and nontraded goods could therefore be accommodated easily. Bayoumi and Eichengreen (1996) and Calomiris and Hubbard (1996) provide econometric evidence consistent with this interpretation.

Differences in the Nature of Capital Market Integration

While integration measured in terms of net capital flows as a percentage of GDP is similar in post-1975 and pre-1914 periods, gross flows (analogously scaled) are larger today. Bank for International Settlements (1997) data on turnover in the foreign exchange market suggest that gross flows amount to about $1.25 trillion a day, or more than $250 trillion a year. Although no comparable estimates of gross short-term capital flows exist for the pre-1914 era, Bloomfield’s (1968) discussion suggests that these were much lower relative to long-term flows than today.

A second important difference between the nineteenth century and today is the sectoral-functional
composition of the investment. Although data on the composition of pre-1914 portfolio investment are incomplete, probably the best estimates are those for Great Britain, the leading creditor of the period. (British investors held about 40 percent of the stock of long-term foreign investments outstanding in 1913 according to conventional estimates. In terms of composition, there is no reason to think that Great Britain is grossly unrepresentative.) These data suggest that, circa 1913, fully 30 percent of British overseas investments in quoted securities were in the issues of governments and municipalities, 40 percent in railways, 10 percent in resource-extracting industries (mainly mining), and 5 percent in public utilities. Thus, 85 percent of overseas portfolio investment was in the securities of entities with tangible and transparent assets, including the ability to tax or the possession of resource reserves, railway track, and telegraph and telephone lines. Investment in government bonds and infrastructure projects remains disproportionately important today, but the absence of commercial, industrial, and financial concerns from this list of 1913 investments is striking. Portfolio investment in industrial and financial concerns, whose assets are less tangible and whose operations were by implication less transparent, appears to have been less important in the prewar era of globalization than they are now.

Third, the relative importance of debt and equity has changed, reflecting “emerging” stock markets. The most recent issue of the World Bank’s *Global Development Finance* estimates that stocks and bonds are now of roughly equal importance. Before 1914, the vast majority of portfolio capital flows took the form of bonds, rather than equity.

Fourth, the balance between portfolio investment and foreign direct investment has changed. Direct investment is as important as portfolio investment today, whereas this was not the case before 1914. “Portfolio investment was a far more important component of long-term capital movements before 1914 than direct investment…” (Bloomfield, 1968, pp. 3–4), China being the one prominent exception. In contrast, direct investment has consistently exceeded portfolio investment since World War II. While securities markets have grown explosively in recent years, about half of all capital flowing to emerging markets is still in the form of direct investment.

Finally, the nature of that foreign direct investment has changed. Before 1914, it was undertaken...
Asymmetric Information as an Explanation for These Patterns

As emphasized in the main body of the text, differences in the scope and structure of international financial integration can be understood as a consequence of the greater extent of information asymmetries before World War I. In particular, the relatively narrow range of assets, mainly railway bonds and public debt, that was traded internationally before 1914 can be understood in terms of the obstacles to the international dissemination of information. Assessing the prospective profitability of a railway was not straightforward, but railroad companies at least had tangible assets (rolling stock, right of way) that could be sold off in the event of failure, effectively collateralizing debt external to the firm and, like bank capital, attenuating principal-agent problems between owner-managers and bondholders. The same was not true, or was less true, of most other commercial, financial, and industrial concerns. Similarly, one should not exaggerate the ease of assessing the creditworthiness of sovereign borrowers, but these too had more tangible and transparent assets (specifically, the power to tax) than most commercial and industrial concerns.

The expansion of the range of financial assets that are actively traded across borders today compared with a century ago reflects the diminution of obstacles to information flows.
Appendix II Recent Experience of Industrial and Developing Countries

This section summarizes the broad outlines of the industrial and developing countries' post-World War II experience with capital account liberalization.

Experience of Industrial Countries

The aftermath of World War II was marked by extensive restrictions on trade, other current account transactions, and capital account transactions. Under the European Payments Union (EPU), created in 1950, most quantitative trade restrictions were eliminated, but formal current account convertibility was not achieved until the end of the decade. Most EPU member countries accepted the obligations of the IMF's Article VIII only in 1961; Japan did so in 1964.

In 1961, the OECD set out its Code of Liberalization of International Capital Movements. Notwithstanding these good intentions, capital mobility was still, in most cases, subject to restrictions. Except in Canada, Switzerland, and the United States, which adopted relatively liberal capital account regimes after World War II, liberalization proceeded slowly. The first half of the 1960s saw the gradual relaxation of controls, with the notable exception of the United Kingdom, which tightened restrictions on outflows. Germany, an early starter in liberalizing its capital account, removed its controls on outflows in 1958. (Controls on inflows were kept in place because balance of payments surpluses were applying pressure to the deutsche mark to appreciate.) Japan similarly relaxed its controls on capital account transactions related to exports and imports beginning in 1960 when it abolished its controls on current transactions (Fukao, 1990).

The need to defend nominal exchange rate pegs under the provisions of the Bretton Woods system was a source of pressure to maintain or reinforce controls on international capital flows, especially when strains on the fixed exchange rate system intensified in the second half of the 1960s. After 1964, capital account liberalization ground to a halt as the United States introduced measures to discourage capital outflows (the Interest Equalization Tax of 1964 and restrictions on lending and direct investment abroad the following year). A number of European countries and Japan, for their part, took steps to curtail capital inflows.

With the collapse of the Bretton Woods system in 1971, there was less pressure to maintain controls as a way of defending a fixed exchange rate. That said, domestic macroeconomic difficulties associated with balance of payments pressures, oil shocks, labor unrest, and global recession slowed the process of liberalization. As a result, Italy, for example, tightened restrictions in 1972: it imposed a ceiling on foreign borrowing by banks in 1975 and subjected all foreign exchange transactions to severe restrictions the following year (see Micossi and Rossi, 1986, and Goodman and Pauly, 1993).

At the same time, powerful forces for liberalization were at work in the years following the collapse of the Bretton Woods system. Financial markets were growing rapidly, spurred by technological progress. The increased sophistication of financial instruments made it easier to circumvent restrictions; corporations pressed for the easing of restraints on international capital movements; and multinational firms increasingly used transfer pricing to circumvent controls. Not until the end of the decade, however, did a significant shift toward capital account liberalization take place in major industrial countries. The United Kingdom removed its remaining controls in 1979, and Japan completed its process of liberalization in 1980. Germany lifted its remaining restrictions on capital inflows in 1981 once the effects of the second oil shock moderated the surplus in its external accounts, easing the pressure to restrain inflows. Australia removed capital account restrictions in 1983 and New Zealand in 1984.

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The severe restrictions on capital outflows were part of an overall policy of "financial repression," with real interest rates on government debt averaging -7 percent during 1973–79.

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1984, in connection with their move toward more flexible exchange rate regimes.80

Then, in the 1980s, the members of the European Community (EC; now the European Union (EU)), in accordance with EC directives, took steps toward capital account liberalization. In contrast to trends in many other parts of the world, this action was accompanied by a move toward less flexibility in the exchange rate, an objective achieved through the adoption of the European Monetary System (EMS).81 No realignments took place in the EMS after 1987, the year when the Single European Act, calling for a single market free of restrictions on, among other things, capital movements, was ratified. Having tightened controls in 1981–83, France reversed course and resumed financial liberalization the following year. The Netherlands liberalized capital flows in 1986, Denmark in 1988. France removed its remaining restrictions in 1989, and Belgium, Ireland, Italy, and Luxembourg did so in 1990, consistent with the requirements of the Single European Act. The members of the European Free Trade Area (EFTA) moved in the same direction—Austria, Finland, Norway, and Sweden all liberalizing their capital accounts between 1989 and 1990.

The efforts of the members of the Exchange Rate Mechanism (ERM) of the European Monetary System (as well as EFTA countries shadowing the deutsche mark or a basket of ERM currencies) to maintain fixed exchange rates in the face of free capital mobility suffered a severe setback with the ERM crisis of 1992–93. The Bank of Italy and the Bank of England were forced to float the lira and the pound sterling in the face of large capital outflows, as were the three Scandinavian countries that had been pegging to the European Currency Unit (ECU). As a result of the crisis, Ireland, Portugal, and Spain temporarily reimposed controls. The widening of ERM fluctuation bands at the end of July 1993 in response to another episode of speculative turbulence further increased the degree of exchange rate flexibility. The final steps toward capital account liberalization were then taken by Portugal and Spain at the beginning of 1993, by Greece in 1994, and by Iceland in 1995.

What generalizations can be drawn from this review? In the industrial countries, there has been a strong tendency toward capital account liberalization, although several countries have reimposed or reinforced capital controls during periods of turbulence. Historically, countries with strong balance of payments positions, such as Germany and Japan, have tended to impose controls on capital inflows, while countries with weaker external positions, such as France and Italy, have relied mainly on controls on capital outflows. As Goodman and Pauly (1993) emphasize, countries with restrictions on capital inflows have generally liberalized earlier than countries with restrictions on outflows.

In some countries (including Japan, the United States, and, intermittently, the United Kingdom), this trend toward capital account liberalization has been accompanied by greater exchange rate flexibility, given the difficulty posed by growing capital mobility for the maintenance of pegged but adjustable exchange rates. In other industrial countries (notably, the leading Continental European members of the European Union), the response to the difficulty for pegged but adjustable rates posed by growing capital mobility has been a commitment to economic and monetary union, which is intended to abolish variations in intra-European exchange rates once and for all. For the industrial countries as a whole, the growth of capital mobility has not, therefore, resulted in dramatic changes in the prevalence of fixed versus flexible exchange rate regimes (Figure 6).

**Experience of Developing and Transition Economies**

There are substantial differences among the developing countries’ experiences with capital account liberalization.82 Before 1980, those that liberalized started from a strong balance of payments position (for example, Indonesia, Malaysia, and Singapore). More recently, developing countries have undertaken capital account liberalization under less favorable external conditions, even in the presence of external arrears. And, as in the (non-EU) industrial countries, the overall tendency toward capital account liberalization has been accompanied by a shift toward increased exchange rate flexibility. Some evidence of this tendency is provided in Figures 7 and 8 although, as discussed in Box 3 of the main text, it is difficult to provide quantitative measures of the degree of capital account restrictiveness.

There are substantial regional differences in the pattern of liberalization (Figure 9). According to the

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80The opening of the capital account in New Zealand was part of a general process of financial liberalization, which was followed by large capital inflows and a sharp appreciation of the real exchange rate.

81See Figure 6. Johnston and others (1998, pp.71–2) have previously observed that external liberalization tends to be associated with the adoption of more flexible exchange rates. Indeed, the share of members with Article VIII status increased from 35 percent in 1978 to 78 percent in 1997, while the share of members with flexible (free or managed floating) exchange rates more than doubled over the same period. There is a correlation coefficient of 0.87 between the share of IMF members with Article VIII status and with flexible exchange rate regimes.

82The discussion in this section follows Quirk and Evans (1995).
indices provided in the IMF's *Annual Report on Exchange Arrangements and Exchange Restrictions* (International Monetary Fund, various issues), Latin American countries were relatively open during the 1960s. The 1970s witnessed some increase in the number of Latin American countries maintaining capital account restrictions, with an increase around the time of the collapse of Bretton Woods and the second oil shock. \(^3\) The prevalence of controls increased in the early and mid-1980s, as several highly indebted countries imposed restrictions on capital outflows in the wake of the debt crisis. Capital account liberalization then resumed in the late 1980s and early 1990s.

In Asia, the pattern has been different, with a steady decline in the number of countries imposing capital account restrictions since the late 1970s, and no increase around the time of the debt crisis, reflecting the fact that (with the exception of the Philippines) the debt crisis affected East Asia much less than Latin America. There was a clear acceleration in the process of capital account liberalization in the 1990s, a pattern that is common across regions.

For Middle Eastern and European developing countries, no clear liberalization trend is visible until the early 1990s, and the same goes for African countries, where restrictions on capital account transactions and surrender of export proceeds were applied in virtually every country during the 1970s and 1980s. In transition economies, capital account liberalization has proceeded speedily since 1990, with a rapid removal of requirements to surrender export proceeds and the abandonment of multiple currency practices. Capital account liberalization has proceeded especially rapidly in the Czech Republic, Estonia, and Hungary, but is also well advanced in Armenia, Georgia, Latvia, and Poland.

As highlighted by Quirk and Evans (1995), capital account liberalization in developing countries has typically occurred gradually. It has been part of an overall approach to economic and structural reform and has occurred after the establishment of current account convertibility. The opening of the capital account has typically been accompanied by financial sector reforms. In recent years, however, a number of countries have liberalized the capital account abruptly, in-
including Argentina, Costa Rica, El Salvador, Jamaica, Trinidad and Tobago, and Venezuela in the Western Hemisphere; Hong Kong S.A.R. and Singapore in Asia; Mauritius in Africa; and the Baltic countries and the Kyrgyz Republic among transition economies.

Opening the capital account exposes the domestic financial system to foreign competition. Hence, most developing countries have attempted to implement financial sector reforms before fully liberalizing the capital account. These reforms typically include freeing interest rates on loans and deposits, developing indirect monetary instruments such as treasury bills, and abolishing credit ceilings. Many countries strengthened prudential supervision before opening the capital account, while others undertook these measures concurrently. Nevertheless, preexisting weaknesses in banks' balance sheets and insufficient implementation or enforcement of prudential regulations led to the emergence of severe banking problems in a number of countries that rapidly liberalized their capital account, such as Costa Rica, Jamaica, Latvia, and Venezuela.84

84The financial crises in the Southern Cone in the early 1980s are another telling example. Demirgüç-Kunt and Detragiache (1997, 1998) and Eichengreen and Rose (1998) discuss banking crises in emerging markets. This topic is taken up in more detail in Appendix III below.

In the developing world, capital account liberalization has been accompanied by a “polarization” in the choice of exchange rate regime, with countries responding to the environment of increased capital mobility by either adopting hard currency pegs or moving toward greater nominal exchange rate flexibility. Argentina, Estonia, and Lithuania freed capital account transactions in the context of establishing a currency board.85 Some developing countries instead opted for a more flexible exchange rate (for example, El Salvador, Peru, and Venezuela), whereas others (such as Mauritius and Trinidad and Tobago) abandoned their formal pegs altogether.

One reason it is so difficult to isolate the effects of capital account liberalization on exchange rates and capital flows is that liberalization typically takes place concurrently with other reforms or policy changes. It is often accompanied by a tightening of macroeconomic policy, sometimes in the context of an IMF-supported program. In Central and Eastern Europe, for example, almost all IMF-supported programs entailed measures to facilitate inflows of foreign capital, foreign direct investment in particular. In general, the elimination of controls led to an increase in capital inflows, with an accumulation of foreign exchange reserves and some worsening of the current account position. This was the case in both the liberalization experiments in the Southern Cone in the late 1970s and the more recent episodes.

Both internal and external factors have played an important role in developing countries’ decisions to tighten restrictions on outflows and inflows. Controls on outflows have tended to be imposed or strengthened during periods of economic distress, in particular in countries facing severe capital flight. This was the case for a number of Latin American countries in the run-up to, and aftermath of, the 1982 debt crisis, for example, and in Venezuela in 1994. Numerous studies have found that, notwithstanding the imposition of controls, substantial capital flight ensued (see, for example, Cuddington, 1987, and Dooley, 1988). In addition, the imposition of foreign exchange restrictions led to the emergence of parallel markets and sizable black market premiums.

In contrast to controls on capital outflows, controls on inflows in developing countries have been associated with periods of economic boom, typically when confidence rises following macroeconomic stabilization and reform. Foreign capital has been attracted by high real interest rates, reflecting not only high rates of return on capital (and expected capital gains on financial assets) in emerging markets but also inefficiencies remaining in developing coun-

85Another such example is Latvia, which has pegged to the SDR since 1995 while taking steps to significantly liberalize its external financial transactions.
tries' financial systems; in addition, capital has sometimes been "pushed" out of the mature markets by a relatively low level of interest rates there.86

86Calvo, Leiderman, and Reinhart (1993) and Fernández-Arias and Montiel (1996) have documented the role of external factors in stimulating capital account liberalization in emerging markets. Bartolini and Drazen (1997b) show a strong positive correlation between the tightness of controls in developing countries and the level of real interest rates in industrial countries in the 1970s and the 1980s. The relationship seems to break down, however, in the 1990s, with an acceleration of the trend toward capital account liberalization but no steady decline in industrial countries' real interest rates.

While large capital inflows alleviate liquidity constraints for the recipient country, and foreign direct investment can contribute to increasing productivity

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through direct and spillover effects, these inflows can pose problems for macroeconomic management. If sterilized, they impose large quasi-fiscal costs on the central bank. Lack of sterilization, in contrast, can mean loss of monetary control, while a policy of allowing the exchange rate to appreciate can crowd out net exports. A number of developing countries have adopted controls on inflows in response to these problems, some of which have been geared toward altering the maturity structure of inflows. Such controls have taken the form of quantitative restrictions as well as differential reserve requirements on nonresidents' deposits, and unremunerated reserve requirements on foreign borrowing, etc., as in Chile. (See Appendix IV for a discussion of the Chilean experience.)

A crucial issue is the degree to which these controls can reduce the size or alter the effective composition of inflows, given the variety of financial instruments available to circumvent them (see Appendix IV).
Appendix III  Capital Account Liberalization and Crises: Review of the Literature

The most extensively studied recent crisis episodes are the Southern Cone currency and banking crises of the early 1980s, the 1992 ERM currency crisis in Western Europe, the Mexican crisis and its spillover effects in 1995, and the East Asian currency and financial crisis. In a number of cases, these crises occurred in the context of newly liberalized capital accounts. To be sure, crises can also occur when capital accounts are restricted, but the record of the last 20 years points at least to the possibility that the liberalization of capital accounts heightens countries’ susceptibility to crises. It does not follow that restrictions on international capital movements are necessarily desirable; depending on the mechanisms through which financial integration leads to crises, it may be possible to reduce their incidence by constructing appropriate institutional defenses or adopting appropriate domestic policies.

Unfortunately, no systematic empirical investigation exists of the link between capital account liberalization and financial crises. This section therefore reviews theory and evidence on this relationship.

Capital Account Liberalization and Currency Crises

Since Mundell and Fleming, it has been well understood that a small country with a fixed exchange rate and freely mobile capital cannot pursue an independent monetary policy. Any attempt to set domestic interest rates above or below international levels will be offset by an inflow or outflow of funds. It follows that it is not possible to use monetary policy to stabilize the business cycle. Thus, the decision of whether to liberalize the capital account and, if so, at what speed should be predicated on an assessment of the prospective need to use monetary policy for domestic policy purposes. For instance, if fiscal policy can be effectively used to stabilize cyclical output fluctuations, or if prices and wages are flexible in the short run, then capital account liberalization can be pursued more aggressively. It may be argued that “tying the hands” of domestic policymakers is a desirable effect rather than a drawback of international capital mobility. For this argument to be fully convincing, however, international investors must be trusted to be good judges of domestic policy.

Currency Crises Caused by Inconsistent Policies

A corollary to the Mundell-Fleming proposition is that a country with a fixed exchange rate and free capital mobility that follows an overly expansionary monetary policy will be vulnerable to speculative attacks. A generalization of this proposition is that when domestic and foreign assets become highly substitutable because of capital account liberalization, “the greater the attention given to the exchange rate, the more constrained monetary policy is in pursuing other objectives,” (Obstfeld, 1998, p. 8). Small, open economies are also likely to be more vulnerable to speculative attacks than large open ones. The experiences of Hong Kong, S.A.R. and Singapore may lend support to this view.

As noted by Cooper (1998), the conclusion is questionable, given that many currency crises are preceded by periods of rapid capital inflows, suggesting full endorsement of domestic policies by capital markets.


89Obstfeld and Rogoff (1995) conclude that almost all modern fixed exchange rate arrangements have ended in a currency crisis. See also Klein and Marion (1997).

90For a recent survey of the extensive empirical literature on currency crises, see Kaminsky, Lizondo, and Reinhart (1998). An important issue that will not be specifically addressed in this section is the risk posed by the transition from a regime of restricted capital mobility to one of free capital mobility. This issue has been debated in the large literature on the optimal order of economic liberalization (see, for instance, McKinnon, 1993). Some of the financial crises observed in the last 20 years may have been due to the transition to capital account convertibility rather than to the effects of a fully liberalized regime.

91A generalization of this proposition is that when domestic and foreign assets become highly substitutable because of capital account liberalization, “the greater the attention given to the exchange rate, the more constrained monetary policy is in pursuing other objectives,” (Obstfeld, 1998, p. 8). Small, open economies are also likely to be more vulnerable to speculative attacks than large open ones.

92The experiences of Hong Kong, S.A.R. and Singapore may lend support to this view.

93As noted by Cooper (1998), the conclusion is questionable, given that many currency crises are preceded by periods of rapid capital inflows, suggesting full endorsement of domestic policies by capital markets.
attack. Inconsistent policies would eventually lead to a crisis even in the absence of international capital mobility, but the crisis would be delayed, because agents would have to reduce their holdings of domestic currency through current account transactions (Auernheimer, 1987).

In many countries, domestic financial markets remain at least partially segmented from international markets even after administrative restrictions on capital movements are removed, reflecting transactions costs, informational asymmetries, and other frictions. Monetary policy will then retain some of its effectiveness, so that both industrial and developing countries with managed exchange rates have been able to undertake sterilized intervention. But as financial integration proceeds, sterilization will become increasingly difficult. Attempts to keep domestic interest rates above world rates will provoke persistent capital inflows, while attempts to keep domestic rates below world rates will lead to continued outflows.

**Currency Crises in the Presence of Consistent Policies**

Do all currency crises reflect inconsistent policies? Theory suggests otherwise. In second-generation models of balance of payments crises, there exist two equilibria: a "good" equilibrium in which market participants expect the peg to last, policymakers to follow consistent policies, and crises never to occur; and a "bad" equilibrium in which market participants expect a devaluation, in which they launch a speculative attack, and in which policymakers alter policies to validate the devaluation once it has occurred. (See Obstfeld, 1986.) Accommodation, which validates the initial beliefs and makes the crisis self-fulfilling, may in fact be the optimal policy response (Obstfeld, 1994b), especially if defending the parity is costly. In a country with an open capital account, fending off a speculative attack is likely to be especially painful, because speculators can use a wide range of financial instruments to bet on devaluation and leverage their positions substantially. Large amounts of reserves can be lost in a matter of hours, and short-term interest rates may have to be raised to high levels. Thus, in the presence of an open capital account, speculators may expect policymakers to be more willing to yield to an attack, and self-fulfilling crises become more likely.

Interest in second-generation models intensified in the wake of the ERM crises of 1992 and 1993 when it was not obvious that all the countries targeted by speculators had been following inconsistent policies. Eichengreen, Rose, and Wyplosz (1996a) studied the behavior of macroeconomic variables in the period leading up to attacks in 22 countries from 1967 to 1992. For non-ERM countries, they found evidence that inconsistent fundamentals preceded the attack (namely, larger than normal budget deficits, inflation, and credit expansion), although this was not the case for ERM countries. The fact that the latter attempted to peg their exchange rates, especially from the second half of the 1980s, without the support of restrictions on international capital flows suggests that their susceptibility to self-fulfilling attacks could have been heightened by their having liberalized their capital accounts.

Another type of self-fulfilling crisis is the "debt and currency crisis" to which countries with substantial short-term external debts are vulnerable. If investors suddenly lose confidence in the creditworthiness of a country, they may refuse to roll over its stock of short-term debt, and the country will be forced to finance its debt service out of reserves or current account proceeds. If reserves prove inadequate, a sharp current account reversal must then take place. Inasmuch as domestic banks and corporations are rendered illiquid, the reversal can take place only through a severe and costly contraction of output. In turn, these developments can validate the belief that the country has lost its creditworthiness and render investors' pessimistic expectations self-fulfilling.

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94The dynamics of speculative attacks were first studied by Krugman (1979) and Flood and Garber (1984).
95For a discussion of the drawbacks of sterilized intervention, see Calvo (1991). For an opposing view, see Frankel (1993). It can be conjectured that the widespread use of increasingly ineffective sterilized intervention has been one of the factors contributing to the large size of capital inflows and outflows to emerging economies. It can be further conjectured that attempts to use sterilization to insulate the economy from the effects of outflows contributed to currency crises such as Mexico in 1994 (Folkerts-Landau and Ito, 1995).
96However, the authors do not find that policies in the ERM crisis countries shifted after the devaluation took place, as predicted by second-generation models. Thus, while their findings lend some support to the possibility that crises may not be preceded by a policy deterioration, they do not provide evidence in favor of second-generation models. In a more recent study, Jeanne and Masson (1996) estimate an empirical model of the expected probability of devaluation of the French franc in 1992-93, using a technique that allows them to test whether the economy was in a multiple equilibrium region. They find evidence consistent with this hypothesis.
97If doubts emerge about the solvency of domestic banks or corporations, domestic residents and other holders of domestic assets (such as foreigners who hold domestic equity) may also flee domestic assets in favor of foreign assets, thereby exacerbating the crisis.
98Debt rescheduling or official assistance will then be necessary to avert default. For models along these lines, see Detragiache (1996) and Cole and Kehoe (1996).
99Sachs (1995) and Radelet and Sachs (forthcoming) use this framework to interpret the 1994 Mexican devaluation and the 1997 Asian crisis.
These models of self-fulfilling crises assume that all agents are rational and fully informed. If, however, investors are irrational or imperfectly informed, herd behavior and bandwagon effects may lead to large swings in capital flows unrelated to fundamentals. In this context, capital controls, even if only temporarily effective, may give policymakers the time they need to restore confidence, perhaps by credibly revealing relevant information to market participants or by coordinating the actions of large investors.

Moreover, allowing the exchange rate to float may not restore macroeconomic and financial stability if the foreign exchange market is dominated by imperfectly informed traders. While runs on official reserves may be averted, large fluctuations in nominal exchange rates unrelated to fundamentals could still occur (as explained by DeGrauwe and Dewachter, 1990). Insofar as movements in the real exchange rate tend to follow movements in the nominal rate, distortions of resource allocation and uncertainty about relative prices could result.

Another mechanism that can trigger crises is contagion from other countries. Contagion may occur, for example, if investors are imperfectly informed about the viability of a particular group of currency pegs. If one country is forced to devalue, investors may then revise upward their assessment of the probability of a devaluation in other countries, especially in other countries with at least superficially similar characteristics. Inasmuch as well-diversified international investors may have relatively little incentive to acquire information about all the countries in which they invest, the hypothesis of imperfectly informed investors may be realistic (Calvo and Mendoza, 1997).

A crisis may also spread through trade and financial links. Gerlach and Smets (1995) develop a model in which devaluation by one country leads its trading partners to devalue as well to preserve their competitiveness. In a world in which economies become more integrated owing to increased capital mobility, the potential for spillovers is likely to be increased.

As world capital markets have become increasingly integrated in the last two decades, numerous banking sectors have experienced episodes of instability, culminating sometimes in full-fledged banking crises. Banking crises have plagued a wide variety of countries, from industrial countries to emerging economies, from economies in transition to the poorest developing countries (Caprio and Klingebiel, 1996, and Lindgren, Garcia, and Saal, 1996). Is increased international capital mobility responsible for the proliferation of banking crises? This is certainly a complex question, and no empirical study is available to shed light on it. An important consideration in forming a judgment is that, as shown in the previous section, in many countries capital account liberalization went hand in hand with the gradual liberalization of domestic financial markets, and of the banking sector in particular. Thus, since the early 1970s, a growing number of countries have progressively eliminated ceilings on bank interest rates and directed credit allocation programs, privatized banks, lowered barriers to entry in banking and insurance, and introduced indirect instruments of monetary control. This newfound freedom of action meant that banks were increasingly able to invest in highly risky ventures. In the presence of an appropriate incentive structure, it is reasonable to expect bank managers to control risk by screening and monitoring borrowers and by diversifying loan portfolios; in any case, increased risk would be offset by higher returns. However, when explicit or implicit deposit insurance is present, and the government is expected to intervene to rescue the banking system in case of systemic problems, bankers’ appetite for risk is likely to exceed what is socially optimal. Moreover, financial liberalization, unless it is accompanied by enhanced prudential regulation and supervision, is likely to result in increased banking sector fragility. Demirgüç-Kunt and Detragiache (1998) find that financial liberalization increases the probability of a banking crisis in a large sample of countries.

Perhaps the best-known example of banking crisis following financial liberalization is the U.S. Savings and Loan crisis of 1980–92. At the end of the 1970s, the industry was experiencing serious financial difficulties, compounded by the sharp increase in interest rates in 1979. In the early 1980s, the U.S. Congress and state authorities substantially deregulated the savings and loan industry, allowing thrifts to enter

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100 These swings may lead to currency crises despite the authorities’ pursuit of consistent domestic policies. Chari and Kehoe (1997) provide a formal analysis of these phenomena based on the model of herd behavior of Banerjee (1992) and Bikshandani, Hirschleifer, and Welch (1992). A shortcoming of Chari and Kehoe’s model is that the microstructure of the foreign exchange market assumed in the model is quite different from that of real-world markets.

101 A phenomenon often mentioned in relation to the recent crises in Asia—see for instance Cooper (1998).

102 Masson (1998) calls these effects “spillovers” to distinguish them from contagion.

103 Thus, the Asian crisis has contributed to the weakness of the Japanese economy not only through trade linkages but also because Japanese banks have large exposures to borrowers in the area. Glick and Rose (1998) provide some evidence consistent with the importance of this mechanism.

104 This study also finds that the effect of financial liberalization on crisis probabilities is weaker in countries with highly developed institutions for law and contract enforcement.
more risky activities. Prudential regulation and supervision were weakened rather than strengthened, and generous federal deposit insurance gave depositors no incentives to monitor the riskiness of the institutions (Kane, 1985). The liberalization of deposit interest rates allowed insolvent thrifts to continue attracting deposits by offering high rates of return. The deposits were then gambled in risky ventures, mostly in the commercial real estate sector, while thrift owners and managers continued to receive dividends and generous salaries (Akerlof and Romer, 1993). A total of 1,142 thrifts failed between 1980 and 1992, and the cost of the deposit guarantee to the federal government is estimated at $127 billion, or 2.3 percent of 1990 GDP (Lindgren, Garcia, and Saal, 1996). While the U.S. Savings and Loan crisis is a clear example of a crisis originating from domestic financial liberalization and in which international financial linkages play virtually no role, other episodes suggest that capital account liberalization can sometimes affect the risk of banking sector problems, as well as the modalities in which they manifest themselves and their effects on the economy. What follows illustrates this point, with reference both to the theory of banking crises and to case studies of such crises.

Banks raise funds by borrowing from depositors through short-term, noncontingent loans (demand and time deposits). They lend to consumers and firms using long-term loan commitments that usually carry a nonnegligible risk of default (credit risk). While this enhances the efficiency of economic activity insofar as banks can pool liquidity and credit risk more efficiently than individuals (Bhattacharya and Thakor, 1994), to the extent that pooling cannot eliminate these risks, banks can become illiquid or insolvent. When a significant portion of the banking system experiences illiquidity or insolvency, a systemic banking crisis occurs.

Banking Crises Originating in Runs by Depositors

Diamond and Dybvig (1983) have shown that the banking sector can become illiquid as a result of depositor runs driven entirely by self-fulfilling beliefs. If depositors believe that a bank will become insolvent, they will rush to withdraw their deposits and the bank will indeed become illiquid. Runs can also take place if depositors are imperfectly informed about bank solvency and interpret a random increase in withdrawals as a signal that the bank is indeed insolvent. A run on one bank may lead depositors to withdraw from other banks if it is viewed as a signal that the banking system is in trouble; a run can thereby precipitate a panic (Chart and Jagannathan, 1988).

How are these dangers affected by capital mobility? Theoretical and empirical analysis of this question is not well developed, but some tentative answers can be offered on the basis of closed-economy bank-run models. In a closed-economy bank run, bank customers withdrawing their deposits must increase their consumption or invest in domestic non-bank assets. Both options have welfare costs. With international capital mobility, in contrast, depositors can invest in offshore deposits. If the latter are better substitutes for domestic deposits than are domestic non-bank assets, the opportunity cost of running on the bank is lower, and runs become more likely. International capital mobility may, however, enhance the ability of a bank confronted by a run to continue funding its loan portfolio by borrowing abroad. If the run reflects self-fulfilling beliefs of domestic depositors, foreign investors may still be willing to lend. Conversely, if the loss of depositor confidence reflects a genuine deterioration in bank balance sheets, foreign creditors may be unwilling to step in.

Even if banks are unable (or unwilling) to replace deposits with foreign funding, a decline in domestic credit following a run may be offset by an increase in foreign borrowing by domestic consumers and corporations. In the limit, if foreign bank credit is a perfect substitute for domestic credit, a domestic run need not affect the amount of credit available to the economy. In this case, capital mobility would moderate the adverse effects of the bank run on the real economy and, therefore, the negative feedback effects on the financial system. In practice, however, information barriers and transactions costs are likely to make direct foreign borrowing accessible only to large, well-known corporations even in the absence of capital controls.

In the scenario just described, a bank run would manifest itself in a flight of deposits toward foreign banks that may or may not be matched by increased external borrowing by the domestic corporate sector and/or by the domestic banking sector. If the decline in deposits is not matched by an increase in foreign

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105 Recent contributions stressing open-economy aspects include Miller (1996 and 1998), Goldfajn and Valdés (1997), and Chang and Velasco (1998).

106 In principle, without capital mobility banks may be able to replace deposits with other domestic liabilities, such as bonds. In most countries, however, domestic bond markets are not well-developed. Furthermore, if the run is sudden there may be no time to arrange a bond issue, while credit lines with offshore banks can be hastily arranged. Following the Mexican devaluation of December 1994, Argentine banks lost 16 percent of deposits ($7.5 billion), but obtained additional credit lines from foreign banks of $2 billion (Ito and Folkerts-Landau, 1996).

107 Coordination problems among foreign creditors may be an obstacle, however, especially if the run is on a large bank.

108 Unless they expect to be bailed out by the authorities, as explained below.
loans, perhaps because effective capital controls on inflows are in place, then the run will result in a net capital outflow that will put pressure on the currency. If the exchange rate is pegged, a banking panic can thus lead to a currency crisis (Miller, V., 1998). Through contagion or spillovers in foreign exchange markets, the banking panic in one country may then spread to other countries as well. In the absence of controls on inflows, however, banks and corporates are likely to respond to the run by tapping foreign capital markets. In this case, pressure on the exchange rate will be averted. Nevertheless, the deterioration in the net foreign asset position of the corporate and/or banking sector may lead to problems down the road, specifically when the debt needs to be serviced. Unless hedging instruments exist and are employed, this deterioration would imply increased exposure to the risk of an exchange rate depreciation. If the exchange rate is fixed, domestic private debt is short term, and foreign exchange reserves are insufficient to cover it, then an increase in corporate or bank external debt may trigger a self-fulfilling “debt and currency crisis” of the type described in the preceding section. Debt defaults and restructurings may then lead to a deterioration in the balance sheet of banks in the lending countries, potentially spreading the crisis internationally.

Banking Crises Triggered by Currency Crises

The discussion so far has dealt with runs originating in a loss of confidence in the banks. In a country with an open capital account and a pegged exchange rate, a banking crisis can also result from loss of confidence in the currency. If depositors believe that the exchange rate will be devalued, they will seek to convert assets denominated in domestic currency into assets denominated in foreign currency. Unless banks can issue foreign currency deposits, deposits will leave the domestic banking system. (Miller, 1996). Confirming the empirical relevance of this channel, Demirgüç-Kunt and Detragiache (1997) find that countries with a high ratio of broad money to foreign exchange reserves are more prone to banking crises. Interestingly, the effect of this variable is negligible in countries with capital account restrictions.109

A speculative attack against a currency can undermine confidence in the banks even in the absence of a run if interest rates are allowed to rise in response to the attack. An increase in short-term rates that increases the cost of funds cannot be matched by an increase in the rate of return on assets because banks lend long term at fixed interest rates. And even if banks were able to increase lending rates commensurately, borrowers might become insolvent at those rates. Eichengreen and Wyplosz (1993) and Obstfeld (1994b) argue that a speculative attack may be triggered by a belief on the part of speculators that the authorities will not raise domestic interest rates to defend the parity for fear of damaging the banking system. A weak banking system may thereby undermine the credibility of a fixed exchange rate regime. But with capital controls in place, the increase in interest rates needed to defend the parity is likely to be smaller and may therefore be compatible with the objective of preserving a weak banking system.

Bank Crises Stemming from Moral Hazard

Many governments have sought to prevent bank runs by introducing deposit insurance. Even where deposit insurance does not exist, they have reacted to bank runs by providing ad hoc deposit guarantees in an attempt to restore confidence, as in the recent crisis in Indonesia. The adoption of implicit or explicit deposit insurance renders less plausible the attribution of recent banking crises to self-fulfilling runs as described by Diamond and Dybvig (1983).110 Rather, increased banking sector fragility may be the result of excessive risk taking induced by deposit insurance itself, as illustrated by the savings and loan crisis in the United States. Banks then get in trouble because increased rates of borrower default lead to an expansion of nonperforming loans, eroding bank profitability and capital.111 Insofar as the perverse incentives created by explicit or implicit deposit insurance are well understood, mandatory minimum capital and liquidity requirements can be used to keep the stake of equity holders high enough and limit moral hazard. Limits on risky activities, on exposures to individual borrowers, and on connected lending can also be imposed to further limit risk. Off-site and on-site inspections can be used to monitor compliance.112 This analysis points to the need to strengthen prudential regulation when liberalizing the capital account.

109If domestic banks do issue foreign currency deposits, then the currency crisis may just lead to a shift into foreign currency deposits within the domestic banking system (Rojas-Suarez and Weisbrod, 1995). In this case, however, the domestic banking system would become vulnerable to the risk of a devaluation. Realizing this, depositors may soon decide that the only safe haven is abroad, and they will run domestic banks after all. This sequence of events closely resembles events in Argentina in 1995: when confidence in the currency board was rocked by the Mexican devaluation, there was a large shift of deposits from pesos to dollars, soon followed by a flight of deposits out of the country (Ito and Folkerts-Landau, 1996).

110Deposit insurance would not prevent bank runs resulting from a loss of confidence in the currency, however, since such insurance does not guarantee the foreign currency value of deposits.

111Financial liberalization, by removing constraints to bank risk-taking activities (such as ceilings on lending interest rates), may have contributed to banking system fragility in some countries (Demirgüç-Kunt and Detragiache, 1998).

112For a discussion of bank prudential regulation and supervision, see Folkerts-Landau and Lindgren (1998).
Appendix IV  The Effectiveness of Measures to Regulate Capital Flows

This appendix surveys the extensive literature on the effectiveness of capital controls. It first reviews the literature in broad brush, distinguishing industrial and developing countries, and then considers the Chilean case in some detail. Chile is singled out because its experience with nonremunerated deposits on capital inflows features so prominently in policy discussions.

Preliminaries

Most of the relevant literature focuses on the capacity of controls to limit interest arbitrage in debt and money markets, generally concluding that controls can have a significant impact on interest rate differentials, at least in the short run. It suggests that governments are able to drive a wedge between domestic interest rates and comparable foreign rates, although the effectiveness of such restrictions diminishes over time as the private sector develops new techniques for avoiding controls.

There are several reasons to think that this literature provides a "lower-bound estimate" of the effects of capital controls. It neglects the experience of wholly closed economies, such as the Democratic People's Republic of Korea, for which there is little question about the effectiveness of controls. It focuses mainly on interest rate arbitrage, a function that is relatively highly developed, while paying less attention to other, potentially more subtle effects of controls, such as those on the composition of international capital movements. Finally, it focuses on controls affecting international trade in bonds and short-term credit instruments, as opposed to controls on equity investment and foreign direct investment. In part, this focus on debt markets may reflect the abundance of data on their operation. But it may also reflect the fact that there is little question about the effectiveness of controls on equity investment by foreigners and on foreign direct investment. Ownership of equity claims (especially large equity claims) on domestic firms often has to be registered with the authorities, in contrast to the anonymity associated with bearer bonds, and equities tend to be traded on a centralized exchange. Similarly, foreign direct investment is easy to monitor and detect. While the literature on the effectiveness and evasion of capital controls is mostly about debt and money markets, it also provides a lower-bound estimate on the effectiveness of controls.

Countries with Well-Developed Financial Markets

Most studies of the effectiveness of capital controls in industrial countries use tests based on covered interest parity or offshore-onshore interest differentials. For currencies where well-developed offshore or forward markets exist, arbitrage should ensure that the covered interest rate parity holds in the absence of controls. At time \( t \), an investor can either buy a dollar-denominated bond, or else convert dollars into, say, yen at the current exchange rate, buy a yen-denominated bond of the same maturity, and sell the receipts on the forward market at the prevailing forward rate. If both bonds have the same default risk, these two operations are exactly equivalent, and, by the law of one price, should have the same return. Hence, any deviation from covered interest parity implies the presence of frictions that are generally adduced to be capital controls. A similar argument can be made for offshore-onshore interest rates on deposits in the same currency. Thus, for currencies with well-developed offshore markets for bank deposits, an alternative test of the effectiveness of controls is based on the differential between the return on domestic bank deposits and the return on similar deposits offered by an offshore branch of the same bank or of a bank with similar characteristics.

A representative study is Dooley and Isard (1980), who examine the effectiveness of the capital controls in Germany between 1970 and 1974, examining the offshore-onshore interest differential. Capital controls are introduced in the regression as a step function constructed using dummy variables, corresponding to the five major doses in which controls were imposed. The results suggest that controls generated a 5 percentage point interest rate differential.
in the period when they were most rigorously applied. This evidence is consistent with Gros (1987), who finds that capital controls can provide only temporary autonomy for national monetary policy and are ineffective in the long run. He reports interest rate differentials between domestic and Eurocurrency deposits for France and Italy from 1979 to 1986 and observes that spreads are very small in periods of "tranquility," but tend to rise in periods of turbulence (immediately before realignments). His interpretation is that controls can be temporarily effective in that they can restrain large changes in investors' positions, making it costly for speculators to adjust open positions. Over longer horizons, spreads tend to return to low levels.113

Browne and McNelis (1990) reach similar conclusions for Ireland. They examine the impact of domestic and foreign money market conditions on Irish interest rates in 1979–86. Their results suggest that domestic factors became more important following the imposition of controls. However, interest parity conditions were restored within six months of the introduction of controls for most assets and liabilities. This theme is developed further by Bacchetta (1992), who explicitly treats the issue of evasion. He uses past arbitrage opportunities as a proxy for the incentives to evade controls and examines Madrid-London interest differentials for the peseta in the late 1980s.114 He argues that the variability of offshore-onshore differentials is too high to be attributable to changes in the regulatory framework, suggesting that it is better explained by the development of activities aimed at avoiding the controls. In support of this view, he estimates an error-correction model specification of the interest rate differential. The results are consistent with the idea that the benefits of evading controls are an increasing function of existing interest differentials. The data confirm that the interest rate differential tended to disappear quickly and that monetary policy was afforded little permanent independence.

Obstfeld (1995) analyzes interbank Eurocurrency interest rate differentials for France, Germany, Italy, and Japan during 1982–93. For 1982–87, he finds that the data are consistent with the view that France and Italy restricted capital outflows and held domestic interest rates artificially low. For the remainder of the sample, however, he finds no evidence of significant barriers to capital mobility inasmuch as the offshore-onshore differential is close to zero, as are arbitrage profits. However, there is evidence that government intervention was effective in driving a small temporary wedge between offshore and onshore interest rates following the ERM crisis.

Jansen and Schulze (1996) use the Dooley-Isard approach to analyze the effectiveness of the Norwegian controls in the 1980s. During this period, Norway had in place a set of restrictions on international capital flows, which it phased out only in 1990. The results suggest that, even in the presence of controls, the Norwegian money market was relatively well integrated. Capital account restrictions did not prevent interest rate equalization, presumably reflecting scope for evasion.

One analysis of the ERM experience is offered by Fieleke (1994), who examines the behavior of differentials between interest rates in the Eurocurrency markets and comparable rates in the domestic money markets of Ireland, Portugal, and Spain. In all three countries, controls were used to defend the currency during the 1992 ERM crisis. The usual interest rate methodology rejects the effectiveness of the controls, because spreads remained close to zero for all three countries. However, given that Finland, Norway, and Sweden, three countries that did not impose capital controls, experienced much sharper increases in the level of interest rates, the question remains as to whether capital controls sheltered Ireland, Portugal, and Spain from the systemwide crisis.115

### Developing Countries

Tests based on covered interest rate differentials are available only for countries with well-developed financial markets. Most emerging markets and developing countries do not have either a well-developed forward exchange market or an offshore market for their currency. Hence, empirical work on these countries has relied on alternative procedures to test for effectiveness. The results of some of these papers should be interpreted with caution because of both methodological and data problems. In particular, some of these studies are characterized by problems of endogeneity that may infect the parameters

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113This view that capital controls are only temporarily effective is reinforced by Spiegel (1990), who examines the case of Mexico. He applies the Dooley-Isard methodology to estimate the effect of the controls of August 1982. His conclusion is that the Mexican program was successful, but only for a limited time, as the impact of controls died out after six months.

114At that time, Spain introduced temporary controls on short-term capital inflows to limit the appreciation of the peseta.

115Fieleke (1994) also offers another perspective from which to evaluate capital controls in the context of a currency crisis. Theoretically, traded and nontraded goods prices react differently to a devaluation. If controls are expected to succeed, the relative market value of the stocks of nontraded goods industries should rise. However, if controls are expected to fail in preventing a devaluation, the relative market value of the stocks of traded goods industries should rise after the imposition of the program. The application of this technique in Portugal in 1992 obtained mixed results.
with simultaneity bias. Moreover, the possibility of misreporting of information, reflecting incentives to avoid the capital account restrictions, raises doubts about the accuracy of some of the data. Thus, studies of emerging markets must be interpreted even more cautiously than those for industrial countries.

Edwards and Khan (1985) introduced a methodology applied subsequently in many studies of countries lacking well-developed financial markets. They started from the assumption that the domestic interest rate can be expressed as a weighted average of the uncovered interest rate parity and the domestic interest rate that would prevail if the capital account were completely closed. Hence, in countries with effective controls, the coefficient (weight) of the foreign interest rate that would prevail if the capital account were completely closed was relatively low. Edwards and Khan apply this approach to Singapore (1976–83), which they regard as a relatively financially open economy, and Colombia (1968–82), which they consider only a semiopen economy. Their results support the hypothesis that capital account restrictions have some impact on equilibrium interest rates. In Colombia, both the foreign interest rate and domestic financial conditions appear to have been important in the period of pervasive controls, while in Singapore the foreign interest rate played the dominant role in the determination of the domestic rate. Haque and Montiel (1991), using instrumental variables techniques, extend the Edwards-Khan (1985) approach to developing countries in which financial repression prevents the use of official interest rate data. They estimate the degree of capital mobility for 15 developing countries. Their findings are consistent with the view that capital controls are ineffective in the sense that the degree of capital mobility in the sample appears to be quite high.

One attempt to examine changes in the effectiveness of controls over time is Reisen and Yeches (1993), who apply a modified version of the methodology in Haque and Montiel (1991) to Korea and Taiwan Province of China. They use time-varying parameter estimates based on the Kalman filter technique to obtain information on how financial openness evolved between 1980 and 1990. They find a low, and possibly decreasing, degree of capital mobility consistent with the presence of effective capital controls. Evidence conflicting with these results is in Dooley and Mathieson (1994), who examine capital mobility in the Pacific Basin from the mid-1960s to 1990. They propose a modified version of the Haque and Montiel (1991) approach to allow for the effects of anticipated inflation and estimate changes in the degree of capital mobility. They find that, despite the presence of capital control programs, capital was almost perfectly mobile, and in most cases the degree of mobility was increasing over time, suggesting that the restrictions were increasingly ineffective.

Similar results are reported in Haque, Kumar, and Leigh (1994), who again extend the basic Edwards-Khan (1985) model, adopting an error-correction formulation of the money demand equation for 27 developing countries. Their results indicate that the degree of capital mobility was much higher than often assumed. Moreover, they find that the financial deregulation of the 1980s had a significant, positive impact on the degree of financial market integration. Maloney (1997) uses a methodology similar to that of Edwards and Khan to analyze the effects of opening the Chilean capital account during 1979–82. In contrast with other studies, the evidence in this paper shows that in spite of the financial reforms, Chilean interest rates behaved as if the capital account were closed for much of the period following liberalization. To test the accuracy of the Edwards-Khan approach, he applies the same methodology to the Japanese liberalization of 1979 for which covered interest parity data are available. In that context, he shows that the two different approaches lead to the same conclusions about the effects of capital account opening.

Phylaktis (1988) follows a different approach. Analyzing Argentina during 1971–84, she uses realized spot rate changes as a proxy for the expected exchange rate changes (or the forward discount). Although she confirms that capital controls affected the uncovered interest rate differential, her methodology is open to the objection that it requires restrictive assumptions about agents’ expectations of future exchange rate changes (see Obstfeld, 1995). In particular, it requires that the uncovered interest rate differential be an unbiased predictor of future exchange rate changes. Moreover, even if this restrictive assumption is valid, there are other serious problems. If agents perceive a finite probability of a discrete change in the exchange rate, which does not actually occur in the sample period, the interest rate differential will systematically exceed the spot rate change, in the phenomenon known as “peso problem.” The uncovered differential test will then tend to overestimate the effectiveness of capital controls. In a similar paper, Wong (1997), uses sophisticated version of uncovered interest rate parity to test for the openness of various Asian countries’ financial markets. He finds that the presence of black markets in foreign exchange significantly eroded the effectiveness of capital controls. A different approach is in García and Barcinski (1996), who examine Brazil in the 1990s. They construct three measures of the covered interest rate differential, using the U.S. dollar futures in Brazil, Brazilian bonds indexed to the U.S. dollar, and Brazilian bonds issued in U.S. dol-

\[ \text{In other words, the exchange rate expectational error has to be zero on average.} \]
lars. All these approaches lead to the conclusion that the controls imposed in the second half of 1993 were ineffective.

It is possible, of course, that governments respond to international and financial conditions changing capital account regulations, rendering capital controls endogenous. Some evidence on their endogeneity is provided in Edwards (1989), who analyzes the relationship between currency devaluation episodes and changes in capital account regulations. He examines the evolution of controls for 39 countries in the years that preceded currency devaluations. In the great majority of the cases analyzed, devaluation was preceded by a significant increase in the prevalence of exchange rate controls and restrictions. This evidence confirms the hypothesis that capital controls are, at least in part, an endogenous variable and that governments react to capital flows with regulatory reforms.

Cardoso and Goldfajn (1998) develop this idea for the case of Brazil. They argue that capital controls are not exogenous and show, consistent with Edwards (1989), that the government reacts strongly to capital flows by adjusting the intensity of control measures. Using a vector autoregression approach, they show that capital controls are effective in reducing flows and changing their composition in the short run, although there is little evidence that they have lasting effects. The reaction of the private sector is also examined in Dooley, Mathieson, and Rojas-Suarez (1997), who construct a measure of the cost of undertaking private capital flows in countries with capital controls, based on the past history of uncovered interest rate differentials and the current account. If the cost associated with disguised flows has tended to fall over time, then financial integration should have increased even in those countries that have maintained capital account restrictions. The authors’ estimates for Mexico, Korea, and the Philippines suggest that between the 1970s and the 1990s the cost of undertaking private capital flows fell by some 70 percent.

Few papers have attempted to examine the effectiveness of capital controls using direct measures of international capital flows. An exception is Johnston and Ryan (1994), who analyze the impact of controls on the capital account with data for 52 industrial and developing countries. They use different measures of private capital flows than those reported in the official balance of payments statistics, including errors and omissions and estimates of unrecorded flows and trade misinvoicing. The impact of controls on capital flows is estimated by F-tests for structural differences between regimes with and without controls and by estimating the coefficients on dummy variables intended to capture the nature of the restrictions. The results suggest that capital controls were largely ineffective in insulating developing countries’ balance of payments, while they significantly affected the composition of capital flows in industrial countries.

### Chile’s Experience with Nonremunerated Deposits

In the early 1990s, Chile experienced a surge in capital inflows that created a conflict between the authorities’ internal and external objectives. The problem was how to maintain a tight monetary policy without hindering Chilean export competitiveness. In 1991, the central bank attempted to resolve this dilemma by imposing a one-year unremunerated reserve requirement on foreign loans, which was designed to discourage short-term borrowing without affecting long-term foreign investments. The fixed holding period of the reserve requirement implied that the financial burden diminished with the maturity of the investment. Between 1991 and 1997, the rate of the unremunerated reserve requirement was increased and its coverage extended in several steps to cover most forms of foreign financing except foreign direct investment. Currently, there is a one-year minimum holding period on capital inflows (applying to all inflows above $10,000 except for short-term borrowing and holding of American Depository Receipts). Bonds issued abroad by local companies must have an average maturity of at least four years. In addition, there is a 10 percent unremunerated reserve requirement, also with a one-year holding period, for all external liabilities that do not increase the stock of capital, regardless of their maturity.

This measure applies to all inflows that do not increase the stock of capital. In practice, this means that not only loans, but also fixed income securities, and equity investments (American Depository Receipts) are subject to the unremunerated reserve requirement. Hence, only primary issuances of American Depository Receipts and foreign direct in-

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117Evidence to the same effect is provided by Eichengreen and Masson (1998).

118One difficulty is controlling for other factors that may also affect the behavior of the capital account. In particular, capital controls become an endogenous variable to the extent that governments react to capital flows by changing the nature and the extent of the restrictions. Hence, a positive spurious correlation might emerge between the extent of the restriction and capital flows.

119The rate of the unremunerated reserve requirement, which had been 30 percent since May 1992, was reduced to 10 percent in June 1998.
investments (over $1 million) are exempted from the reserve requirement. However, American Depository Receipts primary issues are subject to two minimum rating requirements (BB), granted by internationally recognized credit rating agencies.

The Chilean experience has also been viewed as a means of controlling the composition of foreign borrowing without hindering the volume of capital inflows to the country (see Le Fort and Budnevich, 1996). However, the evidence on the effectiveness of the Chilean controls in reducing the short-term external debt is somewhat ambiguous.

Table 2 and Figure 10 describe the evolution of Chile's external debt. They suggest that the introduction of capital controls affected the maturity composition of net capital inflows only after 1995 when the controls were strengthened. When the controls were initially introduced, the short-term component of the external debt dropped 5 percentage points in 1991, but climbed back to about 25 percent in 1992. It was only in 1996 that short-term debt fell below 20 percent of total external debt. In 1997, the short-term component declined to 11 percent.

Data from the Bank for International Settlements (BIS) on the maturity structure of Chile's external debt also lend support to the view that capital controls have had some effect in limiting the short-term component of Chilean external debt. At the end of June 1997, loans with less than one year to maturity represented 43 percent of Chile's total exposure to banks in the BIS area—one of the lowest ratios among the major emerging market economies (see Table 3).

Table 2. Evolution of Chile's External Debt

<table>
<thead>
<tr>
<th>Year</th>
<th>Short Term</th>
<th>Total External Debt</th>
<th>Percentage of Short-Term External Debt</th>
<th>Debt/GDP Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>1988</td>
<td>3,462</td>
<td>18,914</td>
<td>18.3</td>
<td>78</td>
</tr>
<tr>
<td>1989</td>
<td>4,367</td>
<td>17,645</td>
<td>24.7</td>
<td>63</td>
</tr>
<tr>
<td>1990</td>
<td>5,027</td>
<td>19,070</td>
<td>26.4</td>
<td>63</td>
</tr>
<tr>
<td>1991</td>
<td>3,952</td>
<td>18,116</td>
<td>21.8</td>
<td>53</td>
</tr>
<tr>
<td>1992</td>
<td>5,496</td>
<td>20,263</td>
<td>27.1</td>
<td>47</td>
</tr>
<tr>
<td>1993</td>
<td>5,663</td>
<td>21,364</td>
<td>26.5</td>
<td>47</td>
</tr>
<tr>
<td>1994</td>
<td>6,497</td>
<td>24,109</td>
<td>26.9</td>
<td>46</td>
</tr>
<tr>
<td>1995</td>
<td>6,254</td>
<td>24,559</td>
<td>25.5</td>
<td>36</td>
</tr>
<tr>
<td>1996</td>
<td>4,356</td>
<td>24,701</td>
<td>17.6</td>
<td>34</td>
</tr>
<tr>
<td>1997</td>
<td>3,078</td>
<td>27,639</td>
<td>11.1</td>
<td>35</td>
</tr>
</tbody>
</table>

Source: International Monetary Fund (1997).

120The BIS data include all cross-border bank claims plus claims in nonlocal currency of local affiliates of banks in the BIS area. The total stock of short-term external borrowing according to this source in 1997 was roughly double that reported by Chilean sources. Among the possible explanations for this discrepancy are that the BIS data include foreign currency loans issued by Chilean affiliates of foreign banks and outstanding import credits (both types of loans are not included in official short-term data), as well as that BIS data classify loans by their actual maturity, while Chilean data consider the maturity at the date of issuance. The BIS data on the structure of external debt by maturity also include both public and private sector debt (a maturity breakdown for the private sector alone is not available).

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Table 3. Chilean Debt in Comparative Perspective, End-June 1997
(Millions of U.S. dollars)

<table>
<thead>
<tr>
<th>Country</th>
<th>Total</th>
<th>Up to One Year</th>
<th>One to Two Years</th>
<th>Over Two Years</th>
<th>Unallocated</th>
<th>Percent Short (&lt;1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Venezuela</td>
<td>12,148</td>
<td>3,629</td>
<td>421</td>
<td>6,717</td>
<td>1,381</td>
<td>29.9</td>
</tr>
<tr>
<td>Hungary</td>
<td>10,851</td>
<td>4,018</td>
<td>964</td>
<td>3,653</td>
<td>2,216</td>
<td>37.0</td>
</tr>
<tr>
<td>Colombia</td>
<td>16,999</td>
<td>6,698</td>
<td>1,423</td>
<td>8,503</td>
<td>375</td>
<td>39.4</td>
</tr>
<tr>
<td>Chile</td>
<td>17,573</td>
<td>7,615</td>
<td>673</td>
<td>8,898</td>
<td>587</td>
<td>43.3</td>
</tr>
<tr>
<td>Mexico</td>
<td>62,072</td>
<td>28,226</td>
<td>2,659</td>
<td>24,647</td>
<td>6,540</td>
<td>45.5</td>
</tr>
<tr>
<td>Poland</td>
<td>9,249</td>
<td>4,274</td>
<td>436</td>
<td>3,223</td>
<td>1,316</td>
<td>46.2</td>
</tr>
<tr>
<td>Slovak Republic</td>
<td>3,656</td>
<td>1,710</td>
<td>304</td>
<td>1,514</td>
<td>128</td>
<td>46.8</td>
</tr>
<tr>
<td>Turkey</td>
<td>25,060</td>
<td>13,067</td>
<td>2,516</td>
<td>8,087</td>
<td>1,390</td>
<td>52.1</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>11,378</td>
<td>6,078</td>
<td>967</td>
<td>3,508</td>
<td>825</td>
<td>53.4</td>
</tr>
<tr>
<td>Argentina</td>
<td>44,445</td>
<td>23,891</td>
<td>1,662</td>
<td>15,207</td>
<td>3,685</td>
<td>33.8</td>
</tr>
<tr>
<td>Russia</td>
<td>69,091</td>
<td>38,308</td>
<td>3,811</td>
<td>24,959</td>
<td>2,013</td>
<td>35.4</td>
</tr>
<tr>
<td>Malaysia</td>
<td>28,820</td>
<td>16,268</td>
<td>615</td>
<td>8,248</td>
<td>3,689</td>
<td>56.4</td>
</tr>
<tr>
<td>South Africa</td>
<td>22,889</td>
<td>13,247</td>
<td>1,249</td>
<td>6,132</td>
<td>2,261</td>
<td>57.9</td>
</tr>
<tr>
<td>Philippines</td>
<td>14,115</td>
<td>8,293</td>
<td>326</td>
<td>4,001</td>
<td>1,495</td>
<td>58.8</td>
</tr>
<tr>
<td>Indonesia</td>
<td>58,726</td>
<td>34,661</td>
<td>3,541</td>
<td>17,008</td>
<td>3,516</td>
<td>59.0</td>
</tr>
<tr>
<td>Brazil</td>
<td>71,118</td>
<td>44,223</td>
<td>2,193</td>
<td>19,555</td>
<td>5,147</td>
<td>62.2</td>
</tr>
<tr>
<td>Thailand</td>
<td>69,382</td>
<td>45,567</td>
<td>4,592</td>
<td>16,491</td>
<td>2,732</td>
<td>65.7</td>
</tr>
<tr>
<td>Peru</td>
<td>8,013</td>
<td>5,368</td>
<td>278</td>
<td>1,946</td>
<td>421</td>
<td>67.0</td>
</tr>
<tr>
<td>Korea</td>
<td>103,432</td>
<td>70,182</td>
<td>4,139</td>
<td>16,366</td>
<td>12,745</td>
<td>67.9</td>
</tr>
<tr>
<td>Uruguay</td>
<td>4,370</td>
<td>3,020</td>
<td>104</td>
<td>1,196</td>
<td>50</td>
<td>69.1</td>
</tr>
<tr>
<td>Hong Kong S.A.R.</td>
<td>222,289</td>
<td>183,115</td>
<td>4,417</td>
<td>24,974</td>
<td>9,783</td>
<td>82.4</td>
</tr>
<tr>
<td>Taiwan Province of China</td>
<td>25,163</td>
<td>21,966</td>
<td>236</td>
<td>2,598</td>
<td>363</td>
<td>87.3</td>
</tr>
<tr>
<td>Singapore</td>
<td>211,192</td>
<td>196,600</td>
<td>1,719</td>
<td>9,818</td>
<td>3,055</td>
<td>93.1</td>
</tr>
</tbody>
</table>

Source: Bank for International Settlements.

Literature on the Effectiveness of Chile's Controls

Many studies test for the effectiveness of capital controls by examining either the evolution of offshore-onshore interest rate differentials or whether covered interest rate parity is violated. Since Chile did not have either a well-developed forward exchange market or an offshore deposit market for Chilean pesos, studies of Chile have relied on alternative procedures to test effectiveness. As will be discussed, the evidence regarding the ability of the Chilean controls to drive a sustained "wedge" between domestic and external monetary conditions is mixed. However, there is another dimension to the effectiveness of Chilean-type capital controls—namely, their ability to limit the accumulation of short-term external debt by financial and nonfinancial entities. In particular, there is the issue of whether controls can be used to limit the growth of potential claims on the official safety net underpinning the financial system. Such limits could be particularly important in countries with banking system weaknesses and poorly developed supervisory systems.

Quirk and Evans (1995) observe that net short-term private capital inflows recorded in the balance of payments fell in 1991 with the introduction of capital controls. However, they also observe that net errors and omissions and estimated trade misinvoicing also increased sharply that year. One possible interpretation is that the change in errors and omissions represents an increase in unrecorded short-term flows reflecting an attempt by the private sector to circumvent capital account restrictions.

Le Fort and Budnevich (1996) provide an empirical study that suggests that Chilean capital controls have been effective, because, in the absence of effective capital restrictions, it would have been impossible to keep domestic interest rates above comparable international rates. Their argument implicitly assumes that the mix of sound macroeconomic poli-
cies and sustained growth ruled out a peso problem explanation for the interest rate differential. However, they do not provide an econometric analysis of the degree of effectiveness.

Valdés-Prieto and Soto (1997) analyze the effects of the Chilean reserve requirement on the short-term external debt as a share of GDP. They use the tax revenues generated by the unremunerated reserve requirement as a proxy for the effectiveness of the restrictions and include errors and omissions from the balance of payments in their definition of short-term capital inflows. Their estimates suggest that the unremunerated reserve requirement did not have a significant effect on short-term borrowing before 1995, when the implicit tax increased from 3.6 percent to 6.7 percent, after the central bank changed the regulations and required investors to hold their reserves in U.S. dollars. However, the paper does provide evidence that the unremunerated reserve requirement was effective in 1995-96. Nevertheless, the authors suggest that other forms of short-term borrowing increased over that period as the private sector substituted exempt short-term flows—not always classified as short-term credit in the Chilean statistics—for taxed short-term flows, as the authorities gradually changed the tax design over time to counteract new methods of evasion. A shortcoming of the methodology applied in this paper is the possibility of a simultaneity bias of the estimated parameters, because some of the variables used as regressors may in fact be endogenous.

To overcome this endogeneity problem, Soto (1997) runs a vector autoregression analysis on capital flows, interest rates, and level and volatility of the real exchange rate for Chile. He finds that capital controls have the desired effect of reducing capital inflows. However, the magnitude of these effects turns out to be very small.

Edwards (1998a) tests the effectiveness of Chile’s capital controls indirectly. To compensate for the lack of offshore interest rate and forward exchange rate data, he focuses on the evolution of the real exchange rate and interest rate differential. His hypothesis is that effective controls will alter the relationship between domestic and foreign interest rates and the time series behavior of the real exchange rate. His results suggest that the impact of capital restrictions on the behavior of the real exchange rate has been limited and short-lived. He also provides some evidence suggesting that the persistence of interest rate differentials increased after the introduction of capital controls.

Cardoso and Laurens (1998) find that the introduction of capital controls had some temporary effect on the composition of external financing. This is consistent with the view that the private sector will attempt over time to circumvent restrictions on capital movements. They regress a direct measure of net private capital inflows on an index of capital account restrictions and a vector of control variables, including real interest rate differentials, domestic GDP, and seasonal dummies. Their results suggest that capital controls were effective in the six months following their introduction, but ceased to be effective afterward. However, their analysis does not control for the possibility of simultaneous bias. As in Valdés-Prieto and Soto (1997), a number of the regressors could in fact be endogenous variables. In particular, it would seem difficult to establish the direction of causality between the interest rate differential and capital inflows.

Controls on Foreign Investment

A number of countries still maintain controls on foreign investments, either by restricting foreign direct investment or by limiting the position of foreigners in domestic equities. Unfortunately, there is very little empirical evidence on the effectiveness of these kinds of controls. However, Korea’s experience may shed some light on the impact of such controls on the composition of foreign capital flows and total external debt.

In 1990, Korea started a series of reforms designed to liberalize the capital account. The sequencing of the reforms led to an early liberalization of commercial credit and short-term flows, while it left in place significant restrictions on foreign direct investments and portfolio investments in domestic equities (see Park and Song, 1996, and Johnston, Darbar, and Echeverria, 1997). In 1997, Korea allowed foreign exchange banks to borrow abroad and permitted most forms of short-term financing and commercial credit, while maintaining restrictions on long-term flows. Foreign direct investment through merger and acquisition was not permitted, and approval of the authorities was required for the establishment and extension of a domestic branch of a foreign enterprise. Portfolio investments in domestic equities were also restricted, through a 20 percent limit on the percentage of any listed firm that non-

122Previously, reserve requirements could also be constituted in other currencies, including yen. Because interest rates in yen were lower than in U.S. dollars, investors preferred to constitute their reserve requirements in yen, which carried a lower implicit tax.

123This argument, albeit weak, seems consistent with the behavior of the central bank, which, at the end of 1995, strengthened the regulation extending the reserve requirement to fixed-income securities and to equities.
resident investors as a group could hold (5 percent for individuals).\textsuperscript{124}

To some extent, the Korean capital controls program should have had the opposite effect of the Chilean program. In Chile, controls focused on short-term flows and were designed to reduce short-term foreign borrowing without hindering long-term portfolio investment and foreign direct investment. In Korea, controls focused on long-term investments and should have increased short-term liabilities as a percentage of total foreign inflows and external debt. Data from the BIS confirm this intuition. Chile’s short-term borrowing from banks in the BIS area represents 43 percent of total borrowing, while the corresponding figure for Korea is 68 percent. Furthermore, ranking emerging markets by the relative weight of short-term bank borrowing, Chile and Korea appear at opposite ends of the spectrum (see Table 3). However, more pervasive empirical evidence should be collected before any strong conclusions are drawn.


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