WPS 0901

Opening
the Capital Account

A Survey of Issues and Results

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Opening the capital account allows individuals to diversify and
protect themselves better against risks, as well as increasing the
economy's access to foreign saving. But it also limits the
country's ability to make monetary policy and tax capital.

Increased trade, improved communications, growing internationalization of production, and legalization of foreign currency instruments have increased access to international capital markets. Developing country governments are beginning to consider complementing increasingly open goods markets with de jure capital account liberalization. To assist this analysis, Hanson surveys the costs and benefits of opening domestic capital markets and including some practical issues.

Capital account libera' .ation provides greater access to foreign financing for aggregate investment. It also allows individuals to diversify and protect themselves against risks more easily. But individuals often seek to protect themselves against actual and potential government policies. This may lead to reduced domestic saving when the capital account is opened, particularly in an unstable policy environment.

Open capital accounts reduce the ability to tax capital and to conduct monetary policy (under a fixed exchange rate). They also increase a country's exposure to external monetary shocks. But the loss of tax and monetary independence brings an offsetting benefit: the government's incentive to undertake such policies is reduced, which lessens the risk of policy instability. An open capital account also may enhance the ability to conduct fiscal policy, depending on how international investors respond to variations in fiscal deficits. Finally, in evaluating the costs and benefits of legally opening the capital account, it is important to consider just how open the capital account really is and to what extent existing regulations merely shift the burden of implicit taxes onto those with less access to foreign exchange.

Most evidence about the impact of capital account liberalization comes from industrial countries. Available evidence suggests that developing countries with stable policy environments could benefit from opening the capital account: domestic real interest rates would decline, and there might be a 10 to 15 percent increase in investment, which also might bring better technology and management with it.

Reasonable fiscal balance and a sound domestic financial system are preconditions to successfully opening the capital account. Without these preconditions, capital flight may occur or the government may have to bail out domestic banks. Capital account liberalization can, to some extent, be phased with current account liberalization by legalizing and limiting different instruments and institutions to varying degrees. Finally, trade liberalization programs and exchange rate policy need to be viewed not only in terms of maintaining current account balance but also how they affect the real interest rate and investment, through the capital account.

AN OPEN CAPITAL ACCOUNT:
A BRIEF SURVEY OF THE ISSUES AND THE RESULTS

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A. Introduction

The increase in trade, the increasing internationalization of production and the improvements in communications, together with the legalization of foreign currency instruments in a growing number of countries, have led to a *de facto* liberalization of the capital account. In line with the greater reliance on open goods markets and a *de facto* opening of the capital account, developing country governments naturally are raising questions about fully opening the capital account. As a background to answering such questions, this paper surveys the existing literature on opening up domestic capital markets, much of which was written prior to the debt crisis, as it applies to the current situation.

In this context, it should be noted that this survey defines a liberalized or open capital market as one in which individuals and firms can access international financial markets freely, not just one in which the government intermediates international capital flows to balance differences in private saving and investment. In fact, private agents in many developing countries currently have greater access to international capital markets than their governments, particularly given the possibilities that private agents have for collateralizing their debt. This situation is a dramatic reversal of the situation of the late 1970s, when developing country governments intermediated large volumes of foreign funds at low real interest rates while private agents lacked comparable access to international capital.

This survey begins with a brief summary of the costs and benefits of capital account liberalization, paying particular attention to the issue of the loss of policy effectiveness and noting the new theories of capital flows based on international portfolio diversification of risky assets, which raise the possibility of benefits from capital account liberalization that are not linked solely to higher investment rates. The survey then reexamines the evidence on the results of open capital account. Unfortunately, much of the evidence relates to industrial countries and much of the evidence relating to developing countries relates to the turbulent period in Mexico and the Southern Cone at the end of the 1970s and beginning of the 1980s. Finally, the survey reexamines the question of sequencing the liberalization of the current and capital accounts, to provide a background for programs to liberalize the capital account.

B.   The Costs and Benefits of Capital Account Liberalization

B.1   The Traditional Analysis

The traditional welfare analysis of capital account liberalization in a developing country focuses on the benefits of allowing foreigners to own more domestic capital (MacDougall). This analysis begins from a situation of autarchy, analogously to the traditional analysis of the welfare implications of free trade. In autarchy, the rate of return in the domestic market is assumed to exceed the rate in the rest of the world. Once the capital account is opened up, this differential generates a capital inflow and a larger capital stock in the home country. In the final equilibrium, GDP is higher because of the larger capital stock. Domestic laborers gain at the expense of both domestic and foreign owners of capital, so GNP also is higher. A similar analysis applies in the growth theory context, foreigners will support a higher level of capital in country at lower cost, in terms of foregone consumption, than domestic saving alone. (See Annex)

The traditional analysis seems more appropriate to liberalizing the rules governing direct foreign investment than to liberalizing the rules on financial flows or the capital account as a whole. In effect, foreign investors are assumed to bring in capital goods and take away part of the additional production, thereby resolving the transfer problem and leaving the country better-off because of higher demand for its labor. According to this analysis, financial flows would raise welfare only to the extent that they lead to a higher capital stock. Analogously to the optimum tax on trade, this analysis suggests that welfare may be increased by taxation of foreign capital inflows, if their supply to the country is not perfectly elastic or depends on the total volume of the country's borrowing as well as the returns to individual projects (Kemp, Hanson (1974)).

This analysis indicates only that more foreign saving is desirable. Since foreign saving could be intermediated by the government's borrowing externally, the analysis has no implication for opening the capital account to all participants.

In addition, by effectively beginning from autarchy, this analysis ignores the substitutability that exists between an open current account and an open capital account. As Samuelson (1948) and Mundell (1968 (a)) point out,

> Commodity movement is almost certainly a substitute for factor movements, in this sense: if trade does not originally equalize factor prices and this causes factors to migrate so as to wipe out the difference, none the less before migration has proceeded far enough to equalize factor proportions, factor migration will come to a stop as commodity trade either will have equalized factor returns or will have so reduced the differential as to make the cost of transporting another unit of the factor greater than the present discounted value of the higher earnings it can hope to secure abroad. (Samuelson, 1948)

Thus, within the standard Hecksher-Ohlin world, opening the current account lowers the rental rate on capital -- and the interest rate (See Samuelson (1965)) -- in the country with more abundant capital while raising it in the other. Capital account liberalization and current account liberalization thus are substitutes in the standard trade models. These models imply that the capital account need not be opened to equalize rates of return if the trade account is fully open. Of course this process will take time. Even in the United States, where internal capital flows were free, there were significant and persistent per capita

income differentials (see for example Barts and Stern), probably associated with differential returns on real capital. Moreover, this argument does not contradict the desirability of opening the capital account in order to obtain direct foreign investment that would bring with it technology that cannot be transfe ·ed effectively through licenses or trade.[1]

B.2   Intertemporally based trade and capital flows

The standard Hecksher-Ohlin model determines the pattern of trade based on the relative abundance of factors, ignoring differences in demand patterns. Intertemporal considerations enter only to the extent that differences in time preference explain differences in saving and, ultimately, in factor proportions.[2] In contrast, intertemporal differences in production are the traditional starting point for models of forward markets (See for example, Stein). Intertemporally, seasonality can be smoothed to some degree within an economy through forward contracts and storage. However, if two countries have seasonally-opposite patterns of production, then, in theory, international trade in goods and financial claims could smooth consumption at less cost (Stockman and works cited there).

For example, Southern Hemisphere producers could export temperate zone products produced during their summer to the Northern Hemisphere during its winter. Rather than contemporaneously importing goods with the export proceeds-- a continuously balanced current account matched by a balanced-at-zero capital account -- Southern Hemisphere producers might build up financial claims on the Northern Hemisphere producers. These claims could be exercised later, during the harvest season in the Northern Hemisphere. Over a year, the trade and the capital account each would be balanced, but in each semester the current and capital account would show equal but opposite imbalances. Provided the relevant transport costs were less than the storage costs, real resources would be saved by allowing international trading in financial claims.

While interesting theoretically, this model does not yet seem to have much empirical applicability. For example, although Chilean temperate zone fruits and vegetables are abundant in winter markets in the Northern hemisphere, the reverse trade does not seem to have developed. Whether this is because differences in market size and/or seasonal variations in transport costs make exporting the Northern hemisphere's summer production to Chile unprofitable, or because of residual Chilean protection is hard to say.

In addition, on a theoretical plane, the argument simply suggests that international borrowing and lending could reduce the costs of intertemporal differences between production and consumption, which does not necessarily mean a fully open capital account. One theoretical alternative would be for the government to build up and run down international reserves during the year -- individual preferences could be indulged by allowing forward trading against the country's reserves. Of course an open capital account would be the most straightforward solution to obtaining the benefits of trade based on intertemporal considerations.

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[1] See Moran for a discussion of a theory of direct foreign investment along these lines.

[2] See Deardorff and Hanson for a two-country model that links saving rates, and factor proportions and the pattern of trade over time.

B.3   Risk

Recent analysis emphasizes the role of risk bearing and risk sharing in financial markets and, by extension, international financial markets. If the prices for bearing or sharing certain risks differ between countries, then there would be gains from trade in international financial assets embodying these risks that are analogous to the gains from international trade in commodities (Svensson, and Persson and Svensson). "All of the arguments against restricting international trade in goods also apply to restricting international trade in financial assets, whether these restrictions occur in the forms of direct controls, taxes or regulation of financial intermediaries." (Stockman, p. 536) Similarly, all the caveats regarding the benefits of free trade in goods also would apply to the benefits of free trade in risky assets.

Bringing in the element of risk is thus a major shift from the traditional analysis of capital flows, because it delinks the welfare implications of an open capital account from its effect on investment. **Even if saving and investment are unaffected by allowing capital flows, i.e. even if the private capital account were exactly balanced by inflows and outflows of capital, the individual agents of the economy would benefit from trade in risky assets.**[3]   Moreover, the argument that individuals should be allowed to trade assets internationally, based on differences in preferences, production and evaluation of risk, is, analogously to the trading of commodities, perhaps the strongest argument for open capital markets in the sense defined in the introduction.

B.4   Taxation, and the Risk of Taxation

Developing country analysts, when asked to rationalize a closed capital account, often answer with some of variant of "otherwise we would lose all our savings". In terms of the traditional analysis, this view suggests that capital in the country would fall if the capital account were opened. If this view were true, it would suggest that the rate of return in the economy is less than the rate of return in the rest of the world. However, developing countries generally are thought to have lower levels of capital per worker than developed countries, which should imply higher rates of return in developing countries in the absence of capital movements.

Underlying country risk, unrelated to country policy, is one possible explanation for outflows of capital from developing countries, despite domestic rates of return that exceed world rates. For example, borrowers from a mono-exporter would face a risk premium in international markets related to the price risk on the mono-export; residents would try to diversify their assets into instruments that have a different risk. However, an open capital account might also attract investors interested in diversifying their portfolios by purchasing assets with a different risk return tradeoff than prevails in their own countries. Gross capital outflows would certainly occur, but the effect on the capital account would depend on the balance of the inflows and the outflows, and the degree to which the mono-exporter allowed the development of attractive instruments for foreign investors.

Taxation and the risk of taxation probably are a more important explanation for the apparent paradox of capital outflow from what should be high return countries than underlying country

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[3] Of course, this assumes differences in the autarchic prices of comparable risky assets across countries. Svensson develops a model in which trades in assets may occur because of differences in the autarchic pricing of similar risks and because of differences in the autarchic pricing of payments over a given time span.

risk. To investors, high taxes and potential taxes on capital in developing countries, including the possibility of expropriation, easily could offset higher-than-international rates of return to capital and financial assets.

The tax issue is compounded by the tax preferences offered foreigners in many industrial countries and banking centers. Offshore banking centers, and many industrial countries, do not tax interest earned on savings accounts or, at least, interest earned by foreign holders of savings accounts. For example, the United States has not taxed interest income on savings accounts belonging to foreigners since the 1970s. Moreover, competition for deposits among financial centers has meant that data on foreign owners of deposits is not available to income tax authorities in the country of origin -- if one center were to provide the information, then tax considerations would cause capital to shift to other centers. The differential tax treatment of foreign and domestically owned deposits could, in theory, given rise to two-way capital flows based on tax avoidance, so called round-tripping (Tanzi and Blejer).

Taxation of financial instruments takes many forms beside simple income taxation. For example, inflation represents a tax on all financial instruments that have zero or fixed interest rates. Reserve requirements that are unremunerated or carry fixed remunerations are another way of imposing the inflation tax. However, the incidence of the implicit tax arising from reserve requirements may fall on depositors or borrowers. This means that, with an open capital account, an increase in the inflation tax on reserve requirements may motivate capital inflows as well as outflows. For example, with an open capital account, depositors in banks would be able to demand deposit rates equivalent to international rates. This would mean that the impact of higher-than international costs of reserve requirements would be felt solely in lending rates, where differences in information reduce competition between foreign and domestic banks more than in deposit taking. The higher lending rates, in turn, would induce foreign banks to increase their direct lending from home offices, thereby generating a capital inflow. Firms that could borrow internationally would do so, another source of capital inflows.

The risks of potential taxation, as well as actual differences in taxes, represent a rationale for "capital flight". The potential for higher future taxation means that domestic financial assets must carry a risk premium to be equivalent, in the minds of potential asset holders, to assets in the rest of the world.[4] There also exists a risk that a country may default on its international obligations, over and above the risk associated with individual projects (See Dooley and Isard, and Hanson (1974)). Thus there may be a number of risk premia, in addition to the risk premia associated with the various forms of taxation, and differences in the variability in inflation, the exchange rate, and domestic interest rates. These risk premia, and changes in them, are one explanation of the imperfect substitutability between the financial assets of different countries. They also explain why interest rates may be higher than international rates in countries that are presumed to have low capital-labor ratios. Such risk premia have a real cost, in terms of reducing the domestic capital-labor ratio and domestic consumption below what it otherwise would be (See the Annex). Hence, any policies that can reduce this risk premium would tend to raise GNP.

To summarize, "country risk" explains why an open capital account might lead to capital outflows from what are potentially high return countries. Capital account controls are needed in order

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[4] See for example Dooley. The existence of such risk premia, and the possibility that foreigners will be treated more favorably than domestic assets holders, can lead to simultaneous borrowing abroad and capital outflows (Dooley, Dornbusch (1984), Khan and Haque).

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to tax domestic capital at higher-than-international rates. To the extent that the capital account can be kept closed, preventing capital outflow that otherwise would occur because of higher rates of actual and potential taxation, and to the extent that legal arrangements can be made to offset the potential negative impact of these capital controls on capital inflows, then the negative effects of capital account controls can be partially offset. In these circumstance, there may, indeed, be costs of opening the capital account. This is particularly true taking into account the distributional implications of being able to tax capital more heavily than would be possible with an open capital account.

A critical question is whether the *de facto* internationalization of capital already makes it difficult to tax capital. In answering this question, it is important to note capital controls and high taxation are likely to motivate attempts to internationalize domestic capital, by establishing channels through which capital can be transferred internationally. The longer capital controls have been imposed, the more porous they are likely to be. To the extent that capital can be moved fairly freely internationally -- for example by over-invoicing imports and under-invoicing exports -- then laws to keep the capital account closed simply represent a hinderance to domestic capitalists, that encourages corruption. Maintenance of such ineffective laws is not a valid reason for not opening the capital account.[5]

Moreover, since capital controls are only partially effective, they change the incidence of taxation of capital. Some types of capital can be moved less easily internationally than others, some savers and investors have less access to international markets than others. These types of capital and these agents thus are more subject to capital taxation than those that are *de facto* internationally mobile. If capital that is *de facto* internationally mobile also is owned largely by large capitalists, then any favorable distributional implications of capital taxation *cum* capital controls may be reduced or even reversed. Indeed, one argument for allowing an open capital account is that it allows all citizens, not just those with easy access to foreign exchange, to reduce the burden of taxes on savings, such as the inflation tax.

B.5 Open Capital Markets as Limitations on the Effectiveness of Policies

The possibility of avoiding taxes when the capital account is open is a one example of the general point that an open capital account limits the impact of government policies. An open capital account limits governments' ability to tax capital or financial assets, to the extent that economic agents can easily switch their portfolios internationally to escape taxes. Although in a closed economy the impact of various taxes also can be reduced, by substitution in production and consumption into goods with lower rates of taxation, in an open economy even more options are available.

Another widely-known example of how an open capital account may reduce policy effectiveness is Mundell's (1968) analysis, showing that monetary policy is ineffective in a small economy with a fixed exchange rate, open capital markets, and perfect substitutability between domestic and foreign assets.[6] In Mundell's model, the domestic interest rate is fixed by international flows of capital and cannot be affected by variations in the growth of domestic credit. Thus monetary policy becomes

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[5] This is even more so to the extent that governments must make special legal arrangements to encourage certain capital inflows by eliminating the capital controls in particular cases. Since these arrangements typically would require government controls over the inflows, they also might encourage misallocation of resources and corruption. This is another cost of capital controls that must be borne in mind.

[6] Still another example is the possibility that direct foreign investment can offset protection intended to stimulate domestic, import-substituting industry.

ineffective. These and other examples of policy ineffectiveness often are cited as costs of opening the capital account. However, the importance or even the correctness of this argument is far from clear.

In general, an open capital account does not eliminate the effectiveness of policy instruments, it only reduces it. In variants of the Mundell model, price stickiness and wealth effects mean money policy does have a role in determining output, even if interest rates are determined by free international capital flows (Dornbusch, 1976). In addition, imperfect substitutability between assets means monetary policy can affect the differential between foreign and domestic interest rates (the "risk premium" mentioned above) and thus change the domestic interest rate, even in a completely open capital market.

Targeting the interest rate, rather than the money stock is another way to take advantage of the imperfect substitutability between domestic and foreign assets, although it is likely lead to a loss of international reserves. To lower domestic interest rates, a government may offer to lend below international interest rates or rollover government bonds at less than world rates. This will lead to capital flight and loss of international reserves. Thus, whether this policy increases investment, or only capital flight, depends on the elasticity of capital outflow. *Raising the interest rate, by offering interest rates* above international rates, may be more successful in affecting (reducing) investment. Surprisingly, however, this policy also is likely to lead to a decline in net international assets. For example, the Central Bank or the Treasury could maintain domestic interest rates above international rates by selling high interest rate bonds. This policy will attract net capital inflows and raise the interest rate to domestic borrowers. However, it also will generate net obligations for the country, since the inflows of capital can only be invested at the lower, international rate. The country's net external obligations will grow, and eventually raise the risk premium in world markets. Thus, the eventual result of trying to target the interest rate below or above the world rate is a loss in net reserves. Since declining net reserves often are viewed as an indicator of county risk, either policy is likely to lead to a rise in the interest rate premium facing the country in international markets and, eventually, to higher domestic interest rates.[7]

Finally, if only the degree of effectiveness of a policy variable -- the impact multiplier in the language of econometrics -- is changed when capital markets are opened up, then the ability to make policy is not affected. A larger dose of the same instrument will achieve the desired effect. If the application of a policy instrument has no cost, then changes in the impact multiplier of are not important. However, if the cost of using a policy instrument does rise with the size of the intervention, then there may be some costs of capital account liberalization, in terms of policy effectiveness, but these must be set against the benefits of opening the capital account.

One option to overcome any loss of policy effectiveness would be to use an alternative instrument to achieve or to enhance the effectiveness of a policy instrument. For example, again referring to the Mundell model, the use of a floating exchange rate, as opposed to a fixed exchange rate,

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[7] While a government undoubtedly can lower interest rates to certain preferred borrowers and to savers without access to international markets, the resulting reduction in the availability of savings will raise interest rates to the marginal borrower.

restores the effectiveness of domestic monetary policy despite an open capital account.[8] Thus, monetary independence can be restored at the cost of the government's giving up control over the nominal exchange rate and allowing it to float freely. The free float clearly would entail an increase in the variability of the exchange rate and correspondingly greater risks for exporters and importers than a fixed rate system.

Viewed in this light, capital account controls, to the degree to which they can be made effective, are simply an alternative to flexible exchange rates in making monetary policy effective. Countries often have tried to use a different exchange rate or a free float only for capital account transactions -- in effect trying to create another policy instrument -- in order to obtain monetary independence or maintain control over the nominal exchange rate applicable to trade. However, the difference between the multiple exchange rates, and thus the degree of monetary independence, clearly is limited by the ease of arbitrage between the markets.[9]

It also should be noted that the effectiveness of some policies may be enhanced by an open capital account. For example, in Mundell's analysis, fiscal policy becomes more effective with an open capital account because there is less crowding-out.[10] Fiscal policy thus represents not only an alternative instrument to monetary policy for the control of short run fluctuations in aggregate demand, but one which is enhanced by an open capital account. Any cost of a decreased effectiveness of monetary policy thus must be weighted against the benefit of an increased effectiveness of fiscal policy.

A more fundamental question is whether the changes in the effectiveness of policy instruments represents a cost to society. If an open capital account permits residents to escape the inflation tax, or other distortionary taxes, at low cost, then an open capital account does not *a priori* represent a cost to society defined as the sum of individuals; it may even be a benefit.

Some authors have extended this argument: an open capital account, by placing a limitation on the effectiveness of certain government policies, reduces the incentive for their enactment. Thus a country's credibility improves and the risk premium may decline. However, this argument should not be overstated. Even the most credulous investors recognize that "a government intent on extracting an inflation tax from its own residents ... has substantial incentives to deviate from a regime of flexible exchange rates and capital mobility" (Sargent, p. 103). An open capital market can easily be closed if the government wishes to engage in distortionary policies. Perhaps, the argument is better stated by noting that once a capital account is opened, and maintained open for some time, then the incentives to close it again are reduced, because many savers and investors will have diversified their portfolios internationally in the interim, and this will reduce the effectiveness of policy and thus the incentive to engage in such policies.

In sum, it is difficult to conclude whether the impact of opening the capital account on

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[8] In Mundell's model of a small open economy with a floating exchange rate, a one-time increase in domestic credit depreciates the exchange rate, changing either national output or prices, but not necessarily the interest rate. In other versions of the model, with more complicated policy changes, the domestic interest rate may also change.

[9] See for example Fleming, Lanyi, Gros, and Dornbusch (1986). As Lanyi and Gros, in a formal model, point out, if there is a permanent condition (shock) that leads to a difference between the two exchange markets, then arbitrage will develop that eventually will eliminate the gap between the two markets or will require intervention in both markets -- in effect a tax-subsidy arrangement--to maintain the gap.

[10] Of course, a fully open capital account, as defined in this paper, is not necessary to achieve this result -- the government could simply borrow or lend internationally as needed to carry out the desired fiscal policy.

the effectiveness of policy instruments represents a cost or a benefit to society.

B.6 Instability

Another common, related argument against open capital accounts is that they can lead to greater instability. Flows of "hot money" not only can offset monetary policy, as discussed in the previous section, they can cause substantial variations in the nominal and real exchange rate, interest rates, and output. An open capital account also can exaggerate or offset terms of trade shocks, depending on how international creditors react to such shocks.

Economic theory suggests that capital inflows are likely to move sympathetically to a terms of trade shock and thus magnify its effect (See Annex). Moreover, the experience of a number of countries during the debt crisis suggests that the problem of importing world fluctuations through the capital account is only partly a matter of "hot money". The debt problems of the severely-indebted, middle-income countries reflect a period in which private medium- and long-term inflows, as well as short term inflows, first grew to unsustainable levels, and then were cut-off at the same time as the terms of trade collapsed and real interest rates were high. The initial inflows reflected unsustainable and contradictory macroeconomic policies in the borrowing countries, but also rapid monetary growth in the industrialized countries and, in the case of oil exporters, favorable terms of trade.[11] For the foreseeable future, such lending excesses are unlikely to recur. Nonetheless, the experience of this period suggests that the flows of external capital may well magnify shocks.

An open capital account could, in theory, cushion temporary fluctuations in tradeables and their prices. To some extent that may even have happened in the mid-1970s and at the beginning of the 1980s in some petroleum importing countries. Among the various types of capital flows, direct foreign investment may be the best shock absorber, since it acts like equity rather than debt. For example, Reynolds shows that in Chile, the flow of resources from the copper companies to the country were more stable than the terms of trade. However, theoretically and empirically, capital inflows tend to move sympathetically to permanent changes in the terms of trade. This means that at best capital flows can ease adjustment, not substitute permanently for it.

The validity of the instability argument is not, however, solely a question of whether capital flows move pro- or contra-cyclically to variations in international prices. Rather, it also depends on whether the main source of domestic fluctuations is external or internal, much like the classic arguments for and against the flexible exchange rates. If the main source of fluctuations is variations in saving and investment rates in the rest of the world or variations in the rest of the world's evaluation of country risk, and if the economy is operating under a fixed exchange rate regime, then an open capital account might increase fluctuations (leaving aside the shock absorber argument) because these shocks would enter through the capital as well as the current account. However, if the main source of fluctuations is variations in the balance between domestic saving and investment, such as those that arise from unstable domestic policies, then international capital flows could reduce fluctuations in output. Also, an open capital account makes it difficult to apply the inflation tax or conduct an independent

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[11] The historic record suggests that there was not much difference between private and public borrowing from the standpoint of the risk to the borrowing country. Many developing country governments, including Chile, that had emphasized private-private lending without government guarantees, found themselves forced, by a combination of domestic and external pressure, to take responsibility for private external debts that originally had not been guaranteed by the government. These "nationalized" debts continue to complicated macroeconomic policy in many countries even today.

monetary policy, as noted in the last sub-section. Moreover, if a government had a tendency toward the erratic use of the inflation tax, but could be convinced to keep an open capital account, then that capital account policy would induce a more stable policy framework by reducing the incentives to use the inflation tax. Thus, the key issue is whether domestic fiscal and monetary policies tend to offset fluctuations in the domestic economy or cause them.

C.   The Results of Open Capital Accounts

The foregoing theoretical analysis of capital account liberalization suggests three ways of judging or measuring the empirical outcome of an open capital account: the degree of linkage of domestic and international interest rates, the degree of linkage between domestic and world saving and investment, and the extent of trade in risky assets. There is, however, no empirical analysis of the extent of or benefits from trade in risky assets, other than to follow Bryant and observe that an enormous two-way trade in financial assets has developed over the past thirty years[12] and that this trade is probably linked to trade in risky assets. Hence, this section concentrates on the first two approaches to judging the impact of capital account liberalization.

C.1 The Linkage Between Domestic and International Interest Rates: Interest Parity

What is the linkage between domestic and international interest rates? The usual basis for empirical analysis is the theory of uncovered interest parity. If there were no impediments to capital flows and risk could be ignored, then economic theory argues that capital seeks out the highest return internationally, adjusted for the currency denomination of the instruments. Arbitrage means that, in equilibrium, capital flows would generate so-called uncovered interest rate parity between assets denominated in different currencies (Fisher 1930). Mathematically,

(1) $i_d = i_w + E(d\ (EXR)/dt)$

where;

i_i =   the interest rate and subscripts indicate the rates domestically in domestic currency (d) and internationally in world currency (w)

EXR   =   the exchange rate (domestic currency/world currency)

and

E(.) indicates expectations and d(.)/dt indicates the rate of change over the relevant period.

A premium, R, may be added to the equation, to reflect investors' perception that the two assets, of similar maturity and apparently similar risk characteristics, are not perfectly substitutable because of perceived risk or actual and potential impediments in the markets.[13] Some explanations for this premium were noted in Section B, and in particular include the possibility that the country may impose capital account controls that prevent repatriation of interest income and capital or unilaterally abrogate financial contracts. Of course, the largest such recent abrogation of contracts occurred in the debt crisis of the early 1980s, when various developing countries suspended payments of external public debt service for various periods. However, the possibility of abrogation of internal contracts also may

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[12] Moreover, this trade is severely underestimated in the balance of payments accounts, because of the use of differences in stocks at two points in time, rather than actual transactions, to measure short term international capital flows.

[13] Of course, all investors need not regard the two assets as perfect substitutes (aside from the expectation of devaluation) to generate uncovered interest rate parity, only those investors at the margin, who would presumably hold some of both assets. Many investors might hold only one of the assets.

exist[14]; which could create a risk premium between local assets and foreign assets. Moreover, domestic interest rates quoted in "world" currency may differ from "world" rates in "world" currency by a risk premium, to reflect the possibility of conversion into domestic currency at unfavorable terms, as occurred for example, with Mex-Dollars in August 1982 (Ortiz, p.90).[15] In developing countries, the risk premium might be positively related to the volume of foreign investment or liabilities (Dooley, Hanson, 1979), as well as to macroeconomic policy variables.

The post-debt crisis overhang of debt may represent a new and potentially important factor in raising the risk premium facing some developing countries. First, there is a risk that a country with a debt overhang may impose new taxes, including the inflation tax, to service the old debt, as Krugman and others have pointed out. Potential investors include the risk of such taxes in the risk premium that they would require before investing. Second, one alternative to investing in some countries is the secondary market in the country's debt -- alternative liabilities of these countries do not obviously carry less risk of repayment than the instruments trading in the secondary market.[16] Since the mid-1980s, this secondary market has increased in size and sophistication. Moreover, the "securitization" of countries' bank debts has allowed smaller investors to participate and mutual funds to develop.[17] The effective interest rate in the secondary market reflects both the investor's expectation of debt service payments and the secondary market price. The secondary market price typically is below par, reflecting many factors including the market's expectation of the probability of future repayments on contractual terms and the likely buyback price under Brady deals, "world" rates, and other factors (See, World Bank, World Debt Tables 1990-91, Chapter 3.). Hence, the comparable rate could be a multiple of the original terms on the debt traded in the secondary market, depending on the difference between the investor's and the market's expectation of repayment. Whether or not such a rate is the appropriate one for equation (1), it nonetheless must be recognized that the availability of high, albeit risky, returns in the secondary market may well raise the rate of return that must be offered to sophisticated investors in order to induce them to hold financial assets in the country, i.e. the debt overhang and the growing depth and sophistication of the secondary market could have led to a rise in the premium in Equation 1, compared to earlier years.[18]

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[14] For example, in 1982 the Argentine Government imposed a reduction in domestic interest payments under existing contracts; in 1989, Argentine and Brazilian bank deposits were converted into long term bonds with reduced interest rates.

[15] Ortiz (p. 81) suggests such a differential was common in Mexico in the 1970s. However, the government controlled the domestic interest rates and adjusted them only from time-to-time, so the differential did not represent solely market forces. (A similar policy regime existed in India during the latter half of the 1980s for non-resident deposits). The Mexican government eventually pegged the Mex-dollar rates to the corresponding Eurodollar rates.

[16] This applies not only to official liabilities, but to domestic bank deposits, that also may not be paid as originally agreed -- as noted, the governments of Argentina and Brazil both unilaterally converted a large volume of bank deposits into long term bonds.

[17] Moreover securitized debt is beginning to trade outside of developed country markets and the market of the issuing country, e.g. Uruguay, has a market in Mexican debt.

[18] Notice that this argument is somewhat different than the related explanation that new investors would have to share proportionately in the "fixed" capacity of the country to pay, and thus, at the margin, can only expect to get the same fraction of the contractual terms on existing debt as existing creditors. The point here is that not only foreign but domestic investors view the secondary market as an option, particularly as capital markets are opened. Another related explanation linking a rise in the risk premium and the debt overhang is that taxes of one kind or another will have to be raised to pay existing creditors -- hence the below-par secondary market price even for countries that have fully serviced interest obligations -- and these taxes will fall equally hard on any "new" investors.

Some heavily indebted countries have attempted to reduce the premium on new loans by effectively splitting the market and offering new investors preferred status, either by preferential servicing of some instruments to which international as well as domestic investors have access (for example Uruguay's dollar denominated Treasury bills), or by collateralizing new flows (see World Debt Tables 1990-91, pp. 35-36 for a discussion of Mexican borrowers use of collateral). This approach has met with varying success, depending on the perception of country's ability to provide preferred status.

Does capital account liberalization result in uncovered interest parity in practice? To study this question, a number of analysts have added an error term to equation (1) and estimated variants of the resulting equation. Of course, such estimates have a number of problems. First the interest rates must be free, not fixed by the government -- this is usually true in industrialized economies, but often not the case in developing economies (See Hanson and Neal). Second, an expectations mechanism must be described to generate a series for the (non-observable) expected rate of devaluation. Thus the estimate is a joint test of the equation and the hypothesized expectations function. The usual hypothesized mechanism for generating expectations is some version of rational expectations. Another approach is to use the covered interest parity equation to generate a test of the equality between the expectation of the future spot rate and the forward rate (See Cumby and Obstfeld (1984)). This however, does not strictly test uncovered interest parity, but "covered" interest parity. It also depends on a forward market in which there is minimal government intervention and to which there is widespread access, not usually common in developing countries.

Most studies of uncovered interest rate parity relate to industrial countries or Euro-currency rates (for example, Cumby and Obsteld (1981, 1984), Dooley and Isard, Frenkel and Levich (1975, 1977, 1981), Hansen and Hodrick (1980, 1983), Hartman). Only a few relate to developing countries (for example, Blejer (Argentina), Hanson and De Melo (Uruguay), Lizondo (Mexico), World Bank (1984) (Colombia)) and few cover the period since the secondary market developed.

The general result of the studies of industrial countries is that uncovered interest parity does not hold, except perhaps in the Euro-currency markets, where the assets have similar default and political risk characteristics. The explanations for this failure of uncovered interest parity are varied. Since many studies use the covered interest arbitrage condition to reduce the test to the unbiasedness of the forward rate as a predictor of the future spot rate, one strand of argument relates to econometric problems with the use of spot and forward rates (See Cumby and Obstfeld, (1984)). Another strand of argument relates to the "peso problem" -- if agents expect intervention or a sharp change to occur, but it does not materialize in the sample period, then the forward exchange rate will not be an unbiased predictor of the spot rate in the sample. (See for example the discussion in Hansen and Hodrick). Finally, Dooley and Isard argue from the persistent differential between the Eurodollar and domestic German interest rate, that significant risk of capital controls or other political risks could invalidate uncovered interest parity. The last explanation is probably the most important for the developing countries: there may be a substantial and time varying risk premium between domestic and international interest rates. This argument does not, however, invalidate the argument that access to international capital markets can reduce domestic interest rates.[19]

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[19] Some authors also test the equality of real interest rates (See for example, Cumby and Mishkin, Mishkin, and Cumby and Ostfeld (1984) and works cited there, and, for developing countries, Blejer and Gil Diaz (Uruguay)). "In light of the rather strong rejections of uncovered parity and ex ante purchasing power parity, it is not surprising that most of these tests reject the hypothesis that expected real rates are equal across currencies. Nonetheless, the bilateral correlations computed by Cumby and Mishkin (1985) show that ex ante real rates tend to move together, even when defined using onshore interest rates."(Obstfeld pp. 65)

Most studies on uncovered interest parity in developing countries relate to Latin America in the late 1970s and early 1980s, when exchange rate policy and interest policy was aimed at limiting inflation. Moreover, substantial government external borrowing was used to support the exchange rate policy and large capital flight occurred (See for example, World Bank, World Development Report 1985, and Dooley, Helke, Tryon and Underwood for estimates). The results, discussed below, suggest that in this period the uncovered interest parity equation, (1), holds only by adding a substantial risk premium that varies to reflect the expectation of a devaluation that did not actually occur for a long period -- the "peso problem" mentioned above.

For Argentina, Blejer shows that during the period of preannounced exchange rates (1977-1981) the difference between 30 day peso interest rates and Eurodollar rates at the end of the month, adjusted for the actual change in the spot exchange rate over the month, was equal to a (statistically significant) constant (which could be interpreted as the average risk premium) plus "white" noise. However, data in Calvo suggest that there was a large "spike" in the premium as the preannouncement period came to a close, which may make it difficult to draw conclusions econometrically from this period. Lizondo obtains a similar result for Mexico during the period May 1977 through December 1980, using the forward discount to measure expected depreciation. However, domestic interest rates as well as the exchange rate were fixed in this period, leading to some questions as to the result.

In Uruguay and Chile, estimates of the link between interest rates and international rates also have been made for the period of preannounced exchange rate depreciation; the results are somewhat different from Argentina in that in both countries the data suggest a relatively constant premium over the dollar interest rate, despite the preannounced slowing of the rate of depreciation, i.e., the actual depreciation does not appear to enter significantly. Hanson and De Melo show that during the period of preannounced exchange rates the domestic dollar rate was reflected roughly one-to-one in the peso deposit rate and the premium between domestic dollar and peso deposits (i.e. eliminating the country risk) was fairly large and constant, once adjustment is made for periods when low cost forward cover was available. Blejer and Gil also find a large serial correlation in the risk premium over uncovered interest parity. In Chile, for much of the period of the fixed exchange rate, the situation appears similar to Uruguay; the average difference between the local peso interest rate and LIBOR in dollars was 21 percentage points, with a standard error of 3 percentage points in the period II/80-I/82 (See Edwards and Cox-Edwards Table 3-4 pg. 63, by comparison, the premium paid by Chilean borrowers in dollars on international markets over LIBOR averaged only about 1 percentage point). One interpretation of the Uruguay and the Chilean data is that although the actual rate of depreciation did decline, there was a roughly offsetting increase in the risk of a large, sharp devaluation as the degree of overvaluation increased.

In Colombia, in contrast to the Southern Cone countries and Mexico, the exchange rate was not used as an anti-inflation instrument for long periods of time but legal capital controls existed. Once the interest rate on one domestic asset (*certificados de deposito*) was freed, the premium over the international interest rate, adjusted for actual depreciation, appears to be fairly constant for some time (World Bank, 1984).[20]

Although the opening of the capital markets in the Southern Cone had been intended to

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[20] See Khan and Edwards, discussed in the next section, for a somewhat different interpretation of the Colombian data.

lower real interest rates, real interest rates rose in both Chile, and Uruguay; this reflected the slow-down in local inflation coupled with the constant premium over a rising world interest rate. Real interest rates also remained high in Argentina for similar reasons (Calvo). The sustained use of the exchange rate as an anti-inflation instrument in these countries, clearly complicates the evaluation of the impact of open capital markets on domestic interest rates.

C.2 The Linkage Between Domestic and International Interest Rates: Capital Account Openess

Rather than testing whether uncovered interest rate parity holds, Edwards (1985) and Khan and Edwards try to estimate the degree of openess of the capital account. Their approach is to hypothesize that the domestic interest rate can be represented as a weighted average of the foreign interest rate adjusted for expected devaluation (uncovered interest parity) and domestic factors (D):

$$(2) \quad i_d = b (i_w + E(dEXR/dt)) + (1-b) (D)$$

Thus, as b approaches 1 (is not significantly different than one in statistical terms) the domestic interest rate is determined by uncovered interest rate parity and the capital account is fully open. On the other hand, as b approaches 0, the economy is fully closed and international interest rates and devaluation have no effect on the interest rate. In effect, this approach argues that Equation (1) omits domestic variables, that (i) affect the risk premium and (ii) are correlated with the independent variables so as to bias the estimated coefficient of Equation (1). The advantage of this approach is that it allows an estimate of the openess of the economy; in the case of tests of uncovered interest parity, the hypothesis is either rejected or accepted with no intermediate result possible. Among the problems with this approach, in addition to the problems associated with the estimation of expectations of devaluation, are (i) that b is not based on a behavioral relation and may not be stable, particularly if the degree of capital account openess changes over time, and (ii) defining the appropriate domestic variables.

Edwards (Columbia), Edwards and Khan (Colombia and Singapore) estimate this model using the excess supply of money as a proxy for the domestic factors. Using the technique for Colombia (1968-82) Edwards and Khan and Edwards show surprisingly high coefficients for the international interest rate, despite the presence of legal capital controls. Indeed, the results suggest that the international interest rate was passed through almost one-for-one in Colombia, as would be the case in a fully open economy. However, the domestic variables proxying the excess supply of money -- real income, expected inflation and lagged money also enter significantly,[21] suggesting the capital account was not completely open. For Singapore, not surprisingly, the interest rate appears to be wholly determined by the world rate and the domestic variables are not statistically significant.

Edwards and Cox-Edwards (Chile) use the same technique for Chile in the period 1977-82. The external interest rate, adjusted for expectations of depreciation is statistically significant. (Because of the "peso" problem noted above -- the exchange rate was fixed for much of the period -- a Bayesian estimate of expected devaluation that increases as the exchange rate becomes more overvalued

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[21] Colombia followed a policy of indexing the exchange rate during much of this period. However, the estimation separates statistically the world interest rate adjusted for devaluation and the expected inflation; both are statistically significant. This statistical separation may reflect the sharp variation in the dollar interest rate in this period.

is used as the estimated expectation of devaluation.) However, the coefficient is surprisingly low -- statistically less than one -- despite Chile's supposedly open capital account in this period. Indeed, the estimated coefficient is much lower than for Colombia, although the *de jure* capital controls in Colombia were much stronger than in Chile. It is worth noting that the equation does not perform well statistically for Chile, suggesting some estimation problems. As noted above, the difference between the local, peso interest rate and the LIBOR rate in dollars was fairly constant over the period.

A more recent approach (Haque and Montiel (1990a and 1990b)) modifies equation (2) by substituting the interest rate that would prevail in the absence of capital movements as a summary variable for "domestic conditions". This analysis then argues that this interest rate can be derived as the inverse function of the money supply that would prevail in the absence of capital flows. The authors then estimate this counterfactual money stock, using the standard IMF money supply accounting identity[22] and the balance of payments accounts, as the money stock less private capital inflows[23]. One can then either;

(i) use this variable as part of a reduced form of the "domestic" interest rate in the standard money demand function, with its coefficient equal to "b" in equation (2) (Haque and Montiel (1990a and 1990b); or

(ii) estimate the closed economy interest rate directly from the standard money demand function, and then use the estimated rate it to estimate b in (2) (Riesen and Yeches).

Haque and Montiel apply their technique to 15 individual developing countries of widely diverse characteristics, and then to 27 countries in a pooled estimation. The sample period is 1969-1987 in both cases. Broadly speaking the results suggest a surprisingly high degree of capital mobility -- in 10 of the 15 individual country b is significantly larger than zero but not significantly smaller than one in a statistical sense, and for the pooled sample b is estimated at 0.93 which statistically is very significantly different than zero but not significantly different than one.

Reisen and Yeches estimate much a much lower, though still statistically significant degree of capital mobility in Korea and Taiwan, China. Their data also permits a rough estimate of the impact of private capital flows on the interest rate. For Korea it appears that, on average, the access to international capital flows that prevailed lowered the "curb" interest rate about 4 percentage points compared to what otherwise would have been the interest rate. In Taiwan, China, where the estimated degree of capital account openess was lower, there appears to have been only a minimal impact of private international flows on interest rates.

C.3 International Linkages between Savings and Investment

A second approach to testing the implications of open capital accounts focusses on the links between domestic saving and investment and international saving and investment. "With perfect capital mobility, there should be no relation between domestic saving and domestic investment: saving

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[22] Money supply equals reserves plus domestic credit.

[23] The use of private capital flows alone may bias the results downward. To the extent that the public sector borrows internationally, rather than domestically, the interest rate would be higher. There also are questions of whether private capital outflows, as well as inflows, should be used, and whether direct foreign investmer . should be included in the calculation.

in each country responds to the worldwide opportunities for investment, while investment in that country is financed by the worldwide pool of capital." (Feldstein and Horioka, p. 317)

In fact, for most countries, and especially for OECD countries, domestic saving represents over 85 percent of investment on average; foreign saving represents only a small fraction of domestic investment. This observation suggests that although an open capital account could allow domestic investment to move independently of domestic saving, in practice the two variables would be close together. Feldstein and Horioka's well-known paper makes this point econometrically; they estimate the equation:

$$(3) \qquad (I/GDP)_i \qquad = a + b \ (S/GDP)_i + u_i$$

where;   I   =   Domestic Investment
             S   =   Domestic Saving
           GDP   =   Gross Domestic Product
           i indicates a specific country average over the period, and;
           u is an error term assumed to have the usual properties.

Feldstein and Horioka find values of b ranging from 0.91 to 0.87 for average saving and investment rates for OECD countries in the period 1960-74, depending on the exact period and the countries covered. The estimated coefficients are not significantly different from one at the 95% level of significance, i.e. the difference between the coefficient and one is less than two standard errors of the coefficients. The estimated constant, which roughly corresponds to the average current account balance for the countries over the period (see equation (4) below), is usually not significantly different than zero at the 95% level (Feldstein and Horioka, Table 2, pg. 321). Feldstein and Horioka interpret their results to show that

"While a small part of the world capital stock is held in liquid form and is available to eliminate short-term interest differentials, most capital is apparently not available for such arbitrage-type activity among long-term investments. Similarly our finding of the very close link between domestic saving and investment does not conflict with the existence of substantial international flows of long-term portfolio and direct investments. Much of the direct investment is made in foreign countries to enhance trade positions or to take advantage of special knowledge; such investment will not be sensitive to differences in savings rates or relative capital intensities. While some direct and portfolio investments are made in pursuit of higher yields per se, the extent of such investment is apparently limited by institutional barriers and portfolio preferences." (Feldstein and Horioka, p. 328)

In a later paper, Feldstein says, "It is reasonable to interpret the Feldstein-Horioka findings as evidence that there are substantial imperfections in the international capital market and that a very large share of domestic savings tends to remain in the home country"(pp. 130-131). A number of studies using similar data have obtained results similar to Feldstein and Horioka.[24]

Whether all these results say anything about capital mobility, except in the traditional sense of

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[24] For example Feldstein, Bayoumi, Penati and Dooley, Fielke, Summers, Caprio and Howard, and Dooley, Frenkel and Mathieson, which contains a useful summary table of earlier results.

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its supplementing domestic savings, is another question. National accounts imply that by definition:

(4) (I/GDP) = (S/GDP) - (CA/GDP)

where CA = the current account.

The negative of the current account is the net capital flow, including reserve movements. Even if net capital flow is small and not related to investment, there can be significant gross capital flows, or significant net capital flows offset by reserve movements that reflect government intervention in the foreign exchange market. As noted in the introduction to this section, gross capital flows are the most rapidly growing element in the balance of payme   .

The conflict between the Feldstein-Horioka result and the casual observation of apparently high, if not perfect, degree of capital mobility is nonetheless so great that a number of authors have sought to explain the result and demonstrate strong capital mobility. One approach is to focus on some important econometric and data questions. Using equation (3) as a regression equation is equivalent to assuming that the current account is normally distributed and independent of the domestic saving rate. Given the small number of observations in the Feldstein-Horioka results, it is difficult to say much about the distribution of the residual (the current account). However, it is well known that the domestic savings rate, S/GDP, usually is estimated as a residual in the national accounts, with the investment rate and the current account estimated independently. Thus it is quite possible that the assumed error term and the savings rate are not independent, creating a bias in the regression results.

Sachs (1981, 1983) estimated equations of the form:

(5) $(CA/GDP)_i$ = a + $b((I/GDP)_i + u_i$

which avoids this criticism--there are errors of measurement but they are independent of the error term (which is S/GDP_i by the national accounts identity). Sachs' results generally show that the investment ratios have a statistically significant relationship with current account deficits in the OECD. This would seem to contradict the Feldstein-Horioka results. However, Penati and Dooley's results suggest that Sachs' results are sensitive to the choice of sample period and countries.

Another explanation of the Feldstein-Horioka results focusses on the possibility that the high correlation of the average rates of domestic saving and investment across the sample countries does not imply immobility of capital internationally. In some sense this argument is a version of Lucas' critique: if all countries have similar investment productivity and savings functions with similar arguments and "exogenous" variables, then it is not surprising that, on average, there is a close relation between domestic saving and investment (Harberger, 1979). Simply put, what can one say about international capital mobility from a sample of countries that on average have zero current account deficits?

Cumby demonstrates the point rigorously: using a standard result of the life cycle model that savings and investment rates are correlated with population growth (and rates of labor augmenting technical progress) and the share of capital, he shows that OECD country data would generate a high correlation between average rates of saving and of investment, even if capital were completely mobile. Summers and Dooley, Frenkel and Mathieson develop this critique empirically; they show that developing countries have a much lower coefficient than the OECD countries and when they are included in the pooled sample, the coefficient of savings drops sharply, although the difference is not significant

due to the relatively large standard errors of the coefficients. [25] To some extent the developing country results may reflect large aid flows to countries with low incomes and/or underdeveloped statistical systems, rather than greater private capital flows. Some of the middle income countries had much smaller differences between domestic saving and investment, but this reflects reserve accumulation and private capital outflow, as discussed above. For the more highly indebted of these countries, the stock of private lending to some developing countries exceeds their GDP (World Bank, World Debt Tables 1990-91), which is a substantially greater fraction of foreign owned capital than in industrial countries, and which suggests that capital mobility cannot be measured solely by differences between domestic savings and investment, as noted above. All this suggests that to some extent the Feldstein-Horioka results reflect the similarity of their sample countries and that capital is mobile internationally in response to long run differences in rates of return, even in the face of strong barriers to capital movements in some developing countries.

Another critique of the Feldstein-Horioka results develops the argument that the closeness of average levels of savings and investment rates says nothing about whether an exogenous rise in investment would be easily financed by inflows of capital or be limited by domestic saving. In this view, the true test of capital mobility for similar countries is not a comparison of their average saving and investment rates over long periods, but of the correlations between changes in saving and changes in investment within these periods. There are a number of reasons why changes in investment and saving rates could be correlated in the short run --they may arise from private responses to shocks in productivity (Obstfeld) or shifts in world interest rates and terms of trade (Persson and Svensson) or because fiscal policy targets the current account (Tobin, Westphal, and Summers) and thus shifts in public saving offset shifts in private saving, which appears to be true in the data (Bayoumi). However, one could expect that short run changes in savings and investment rates are less likely to reflect common underlying factors, than data over long periods. In general, the results of these empirical estimates (for example, Caprio and Howard (business cycles), Obstfeld (quarterly data)) suggest that the coefficient between changes in domestic savings and investment rates is much lower than the averages over long periods, and generally significantly less than one but significantly different than zero.[26] Interpreted in the spirit of Feldstein and Horioka, this result suggests a substantial, if imperfect degree of capital mobility.

Another question revolves around the source of so-called capital immobility. Obstfeld's correlations of the quarterly changes in savings and investment rates are inversely related to country size -- only in the case of the U. S. and Japan, the two largest countries in the sample, are the correlations close to one, and in the smaller countries the correlations are not significantly different than zero. This result supports Harberger's and Murphy's argument, that for the larger countries, the high correlation between domestic saving and investment rates partially reflects the impact of changes in their domestic savings and investment on the world interest rate and other international variables. This view also is supported by Summer's finding that the estimated coefficient of the investment rate on the saving rate drops when small, less-developed countries are included in the sample.

Bayoumi's paper provides further support for this view, on a broader scale. Generally

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[25] However, Fielke' results, including non-industrial countries, are broadly consistent with Feldstein-Horioka's.

[26] Feldstein's regressions of year to year changes in the domestic investment rate on the year to year changes in the domestic saving rate yield a coefficient of 0.863, from which he concludes that "even year to year increases in saving tend to be associated with increases domestic investment in the saving country by approximately equal amounts". However, the standard error of the regression coefficient is 0.04, so strictly speaking, the association is significantly less than one to one.

speaking the sample OECD countries run growing government deficits over the period 1966-1986. This would tend to increase real world interest rates, *ceteris paribus*, and lead to an offsetting increase in the average difference between private saving and private investment. Depending on intercountry differences and differences in country sizes, this would tend to show up in increasingly lower correlations between domestic private saving and investment, the more so as capital mobility increased -- which roughly corresponds to Bayoumi's results.[27] Moreover, as noted .a Section 1, even in a relatively small country the "risk premium" over the world interest rate might be related to the amount of borrowing.

In evaluating these results and their implications, it appears that in the periods studied there was a fair, though not perfect, degree of capital mobility, where capital mobility is defined in a net sense, i.e. providing foreign saving, rather than in a gross sense, as used in this paper. Even the point estimates of the coefficients of the industrial country regressions suggest that in the long run net liabilities to foreigners would represent 10-15% of the capital stock in a country on average. There also appears to be even more significant short run responses of international capital to short run variations in domestic saving and investment. For the developing countries the relation would be even higher; debt to GDP ratios suggest that gross foreign commercial bank debt in some countries is nearly equal to the capital stock. (See World Bank, World Debt Tables 1990-91), indicative of a fairly high degree of capital mobility but also perhaps a significant degree of country risk. Finally as noted earlier, these results say little about capital mobility in gross terms, in response to differences in the autarchic pricing of risks.

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[27] Bayoumi shows that coefficient of private investment on private saving in the Feldstein-Horioka formulation falls to insignificance after 1975. However, this coefficient rises after 1980. At the same time the regression coefficient of total domestic investment on domestic saving falls (to a level significantly less than one). Whether one should try to interpret these shifts, given the small number of observations (10) and the corresponding low power of statistical test on them is questionable. However, one should note that the world pool of saving probably declined, relative to world investment, after the early 1980s, with the rise in the U. S. fiscal deficit and the reduced saving rate of the major OPEC producers.

D.   The Sequencing and Speed of Capital and Current Account Liberalization.

D.1 The Preconditions for Capital Account Liberalization

A stable macroeconomy is a precondition to international financial liberalization. Opening the capital account increases the opportunity for currency substitution, which increases the rate of inflation (in domestic currency) needed to mobilize a given volume of resources through the inflation tax. However, it is important to realize, as noted above, that under conditions of high and variable inflation the capital account may, *de facto*, be substantially open. Leaving the capital market legally closed increases the incidence of the inflation tax on those without easy access to foreign exchange.

Allowing easier access to international capital markets during conditions of high inflation also can increase the variability of the economy substantially. In high inflation, the domestic currency money base falls as a percentage of GDP. Every nominal and real shock, and every shift in expectations, then has a proportionately greater impact on domestic financial variables. The resulting variability will be further magnified if shifts into foreign exchange denominated assets are made less costly by capital account liberalization -- the money base will become even smaller and the shifts in response to a given shock will become even greater. A sustainable fiscal deficit, which requires only a minimal inflation tax, thus is a particularly important precondition to international, as well as domestic financial liberalization.

External borrowing, directly or indirectly, could, of course, be used to reduce the need for the inflation tax and reduce public sector "crowding out" of domestic investment.[28] (Notice that such increased external public sector borrowing does not mean international financial liberalization as defined in the introduction to this paper.) However, this policy option is fraught with dangers, as McKinnon and Mathieson and McKinnon pointed out, and as recent experience suggests. In the late 1970s and early 1980s, many developing countries used substantial external borrowing to avoid reductions in public sector deficits and to sustain overvalued real exchange rates that were inconsistent with aggregate demand policy. When the initial inflow of funds slowed, real interest rates increased, and commodity prices fell, the debt crisis occurred, which depressed growth rates for many years in the more severely indebted countries. Of course external borrowing has become difficult for many developing countries with the onset of the debt crisis.

It is sometimes argued that opening the capital account will force the government to reduce its reliance on the inflation tax, by lowering the base of the tax significantly. This argument is sometimes extended by saying that opening the capital account will endow anti-inflation programs with greater credibility. To some degree, these arguments are based on the idea that the inflation tax results from the government's rational reflection on the optimal combination of taxes. However, analysis of episodes of hyperinflation suggest that these episodes often reflect a desperate attempt to continue spending rather than a rational portfolio decision about the optimum combination of taxes. Moreover, as noted earlier, governments that intend to use the inflation tax typically close the capital account first. This can be done fairly easily, although, once individuals have built up some assets denominated in foreign exchange during the period of an open capital account, it is difficult to re-close the capital

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[28] The public sector can borrow abroad directly, or the government can allow domestic banks and firms to borrow externally (perhaps with a government guarantee), either way reducing the pressure on the domestic financial system from a given volume of public sector borrowing.

account. Overall, it would seem that merely opening the capital account will not increase the credibility of a stabilization program very much.

Domestic financial liberalization, to a significant degree, is the second precondition to international financial liberalization. If domestic citizens are to be given easy access to international financial markets, through foreign banks, then the domestic banking system must be face essentially the same regulations and controls on interest rates/portfolio composition as foreign banks in their home markets to remain competitive. Moreover, the domestic banks must have sound portfolios. Unless these two conditions are met, liberalizing the capital account is likely to lead to disintermediation that will put pressure on the domestic banking system, force closures of domestic banks and increase claims on the government, in its role as explicit or implicit insurer of deposits.

In a financially closed economy, the domestic banking system often suffers from severe regulation, which benefits the government and other preferred borrowers at a cost to domestic savers and non-preferred borrowers. Perhaps the most important form of such regulation is the control of interest rates-portfolio composition, that manifests itself in high, non-remunerated reserves requirements and below-market, directed credit. Such regulations lead to large spreads between rates on deposits and rates on non-preferential loans. (Hanson and Rocha) Once depositors and non-preferred borrowers obtain access to international financial markets, these spreads make domestic financial intermediaries uncompetitive -- because of the regulations they are unable to set interest rates that will prevent the loss of deposits and their non-preferential loan customers. Such regulations can be applied to foreign banks operating in the domestic market, but they are likely to be less effective than on domestic banks because: 1) foreign banks and associated non-bank intermediaries can often facilitate transactions with home offices that avoid such regulations or 2) they can avoid such regulations within the country using modern technology[29]. Hence, such regulations reduce the competitiveness of the domestic banking industry, and are likely to lead to a loss of business that may imperil some domestic banks.

The domestic banking sector may be charging high spreads because of high costs and the need to provision against poor loan performance. High costs may reflect a number of factors in addition to poor technology and management, such as the sharing of monopolistic profits with members of bank unions and extensive branch networks that were useful for capturing low cost deposits in a period when interest rates could not be set competitively. Poor portfolio quality may reflect not only poor loan decisions and unexpected shifts in relative prices but high-risk, directed credits and favorable terms to non-arms length borrowers. Competition from foreign banks and an open capital market is useful in reducing high spreads that result from poor technology and management, and extensive branch networks. Competition also may force better portfolio selection. However, it probably is desirable for the government to take action to reduce costs associated with the stock of outstanding bad loans (by fully recognizing such loans) and with high labor costs before allowing foreign banks to compete fully with domestic banks. Otherwise the playing field will not be fully level for domestic banks and some of them could be imperiled, for example by the burden of poor portfolio quality, leading to the government's being forced to assume responsibility for their deposits.

D.2 The Sequence of Liberalization: Capital or Current Account

An extensive body of literature focuses on the question of sequencing external

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[29] For example, reserve requirements must be computed on some deposit base. Computer programming can be used to "sweep" large depositors just before the deposit base is calculated and place the funds in accounts with lower reserve requirements/higher interest rates.

liberalization, whether the capital or current account should be opened first. Interest in this question was particularly aroused by the different paths of liberalization in the Southern Cone of South America in the latter half of the 1970s. Chile is generally characterized as liberalizing the current account first, Uruguay and Argentina the capital account first and, in an influential paper, McKinnon (1982) argues that much of Chile's success, relative to Argentina, is due to the different sequencing of their reforms (and to Chile's fiscal surplus as opposed to Argentina's stubborn fiscal deficit). It should be noted, that there is a substantial debate in Chile on the timing of the capital account liberalization and its role in the crisis of the early 1980s. Of course, a number of other factors were at work and, eventually, all three countries' attempts at liberalization suffered reverses in the debt crisis (See for example, the works contained in the Corbo-De Melo World Development issue, Carbo, De Melo, and Tybout, Edwards and Cox-Edwards, Hanson (1986), and Harberger (1982)).

The initial view on sequencing (McKinnon (1973)) was that capital account restrictions should be relaxed only after trade reform, and policy makers should "deliberately avoid an unusual or extraordinary injection of foreign capital" (McKinnon (1973) p. 161.) The rationale for this view is as follows: Current account liberalization typically requires a real depreciation of the exchange rate, to offset the negative effect on the balance of payments of cuts in the average level of protection. In contrast, capital account liberalization tends to produce a real appreciation of the exchange rate. If capital account liberalization were to produce a stable net transfer (capital inflow, less interest payments),[30] then opening both accounts simultaneously might yield something like the final real exchange rate and resources could then be reallocated in accordance with that objective. However, capital inflows must be paid for, so the initial net transfer following the opening of the capital account is likely to be larger than the final net transfer (See Annex). Moreover, the responsiveness of capital to the pent-up demand for local assets is likely to be much faster than the responsiveness of trade flows to the opening of the current account, leading to an unsustainable appreciation of the real exchange rate (Frenkel 1982). Hence, opening the capital account before the current account produces incentives for resource allocation that will have to be reversed in the final equilibrium (Krueger (1986)), and could retard the adjustment to the reduction in protection.[31] To avoid "unnecessary" resource shifts, a number of authors (for example, Edwards (1984), Frenkel (1982), Khan and Zahler, McKinnon (1973, 1982)) have concluded that it is preferable to open the current account before the capital account.

There are, however, some difficulties with this argument. First, the volume of capital resources over time is not necessarily the same under the two different sequences of liberalization. Whenever the capital account liberalization occurs, it tends to cause an appreciation; the point is that once protection is reduced in a capital-scarce country, the rate of return is reduced, as discussed in section A, decreasing the incentive for capital inflows. Thus, there are less "unnecessary" resource shifts in the current account-capital account sequence in part because there is a smaller stock of capital -- the costs this lower capital stock have to be evaluated relative to the benefits of lower costs of adjustment.

This type of argument has led some authors (Little Skitovsky, and Scott, Michaely, Krueger (1981, 1984)) to argue for simultaneous liberalization of the current and capital accounts. In their view, short run adjustment costs and the opposition to reforms that they generate are an important

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[30] This case is analyzed in Edwards (1986)

[31] This argument, of course, resembles the discussion of the impact of direct foreign investment on the highly protected Latin American economies during the 1960s (for example, Diaz Alejandro). A number of theoretical studies suggest that in the presence of distortions, direct foreign investment can reduce welfare.

problem in liberalization. Foreign funds can be used to reduce or offset the costs of these frictions. Thus, these authors generally argue that the capital account should be liberalized at the same time as or even prior to the current account. Of course, this argument is for larger capital inflows; these need not be provided through greater individual access to foreign capital (capital account liberalization) but could come through government intermediation of foreign capital.

These points are examples of a more general questioning of much of the sequencing literature. A strict economic analysis of sequencing requires an intertemporal analysis, allowing for different volumes of capital inflow as well as different degrees of misallocation. Moreover, the analysis should not be limited only to distortions between domestic and foreign prices, but should allow for domestic distortions as well. Some attempts to carry out this type of analysis have already begun (See for example, Khan and Zahler, Rodrick, Edwards (1989) and Edwards and van Wijnbergen); not surprisingly, the argument for the current account-capital account sequence seems to depend on the type and degree of the initial distortions. Moreover, the whole sequencing argument understates the benefits of capital account liberalization because of its neglect of risk.

D.3   The Speed of Liberalization

Capital account liberalization often is treated as instantaneous in the foregoing sequencing literature (See for example Edwards (1986) and Frenkel (1982)), in contrast to the well-known debate on gradual versus rapid trade reform. (See for example, Krueger (1986), Michaely, and Little, Skitovsky and Scott, Edwards and van Wijnbergen.) In fact, the capital account may be opened gradually in a variety of ways, analogously to the methods used in opening the current account gradually. For example, taxes on capital inflow (including differential reserve requirements on banks' use of foreign capital) can be varied, or limitations on banks' and other financial intermediaries use of foreign capital can be varied as was done to some extent in Chile at the end of the 1970s (See Edwards and Cox-Edwards) and again at the end of the 1980's. Another approach would be dual foreign exchange markets -- in contrast to the usual situation the rate applicable to capital account transactions would appreciate initially relative to the current account rate, which could be unified once the first burst of capital inflow slowed.[32] In principle such policies would mean that capital account liberalization could proceed at a pace linked to current account liberalization, thereby avoiding the overshooting of the real exchange rate. One corollary of this argument is that the problem with the capital account liberalization in Chile in the latter half of the 1970s was not opening of the capital account, but the abrupt switch from a closed account, which created pent-up demand for Chilean assets, to a completely open account.

The speed of current account liberalization also is an issue because of positive relation that exists between expectations of devaluation and the domestic interest rate, even in economies with relatively closed capital accounts (See Section B.1). As noted in Section C.2, reduction of trade barriers

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[32] As noted in Section A.5, the difficulty with dual foreign exchange markets is, of course, the problem of separating the two markets and the incentives set up to avoid the separation. In the usual case, there is some desire to maintain an overvalued rate for goods transactions to avoid the inflationary consequences of a devaluation. Capital flight occurs depreciating the rate applicable to capital account transactions and creating incentives to undervalue exports and overvalue imports, in order to bring back foreign exchange through the capital account. In contrast, the problem with liberalizing the capital account discussed above is that the initial burst of capital inflow accompanying the opening of the capital account temporarily appreciates a unified exchange rate. The incentives would be to overvalue exports and undervalue imports to escape the effective tax on capital inflows, in much the same way as export incentives in Colombia and Turkey led to "fictional" exports at various times. Since any separation of the markets for foreign exchange would be short lived, there probably would not be time to evolve sophisticated mechanisms to escape the separation of markets. The chief difficulty is likely to be the government's unwillingness to unify the markets when the capital account rate begins to drop below the current account rate.

typically need to be compensated by a *pari passu* depreciation of the real exchange rate to avoid an increase in the current account deficit. Generally it is thought that this real depreciation can be achieved with lower costs of adjustment by depreciating the nominal exchange rate, rather than through a reduction in domes° c wages and prices. However, depreciation in the nominal exchange rate tends to raise the real interest rate in the economy, because of the increased gains to be made from holding financial assets denominated in foreign exchange. The higher real interest rate tends to depress the rate of investment.

This argument suggests that the pace of trade liberalization and the rate of compensatory depreciation could be important determinants of the rate of investment and growth, even in a fully credible process of liberalization. The relationship is not linear -- very slow trade liberalization requires very little compensatory real depreciation and hence has only minimal effect on the real interest rate and investment; very rapid trade liberalization means a high real interest rate only for a short period, thereafter no real devaluation is needed and the expected rate of devaluation and, correspondingly, the real interest rate decrease. It is only gradual trade liberalization, spread over say 3 to 5 years, that is likely to have an important effect on the real interest rate and investment. Even in such programs, the effect could be limited, by initially overshooting the exchange rate necessary to maintain a constant trade balance.

An example may clarify these points. Consider a program of trade liberalization intended to reduce the average rate of protection of imports by 50 percent. If done over five years at a steady rate, this might require a real depreciation of 3-5% per annum to match the growth of imports to the higher growth of exports. However this depreciation would require an increase of 3-5 percentage points in the real interest rate in order to maintain the attractiveness of financial assets denominated in domestic currency, relative to those denominated in foreign currency. This higher real interest rate would have a negative effect on investment. If the trade liberalization were spread over ten years, the required real depreciation and corresponding increase in the domestic real interest rate would be small; if the full trade liberalization were done at once, or if the exchange rate were devalued sharply early in the program of protection reduction, then there would be a much smaller effect on the real interest rate. Clearly the importance of this effect varies from country to country, depending on the degree to which the rate of depreciation affects the domestic interest rate and the effect of the domestic interest rate on investment. However this argument suggests that it should not be surprising that programs of gradual trade liberalization show little impact on the rate of growth -- such programs tend to depress investment through their impact on the real interest rate and thus reduce the rate of adjustment to the new incentive framework.

E.   **Summary and Conclusions**

The question of the costs and benefits of opening the capital account has become moot to some degree. *De facto*, capital has become internationalized by the growing integration of the world economy. Compared to, say, the 1960s, economic agents have much greater access to foreign currency assets. This reflects the freer international mobility of goods, people, and information, as well as the greater legal availability of such assets in the domestic financial system of many countries. In many cases, for individuals and non-financial firms, it is not access but the menu of assets that is limited. This limitation largely reflects the remaining restrictions on financial firms. It nonetheless seems useful to examine the costs and benefits of opening the capital account, the empirical results of opening the capital account, and the timing and sequencing of opening the capital account, in order to assist countries in the process of capital account liberalization.

Theoretically, perhaps the main benefit in opening the capital account -- in the sense of allowing individuals and firms full access to international capital markets -- seems to come from the greater scope for exercising individual choice in diversifying risk. If domestic and international prices of risky assets differ, then there are benefits from allowing individuals to trade assets or goods and assets. These benefits are analogous to the benefits of free trade in goods, and, correspondingly, are subject to many of the same caveats as the arguments for free trade.

The traditional argument for opening the capital account in developing countries is somewhat different -- that capital inflows will finance increased investment more cheaply, in terms of foregone consumption, than domestic saving. This argument, is perhaps less forceful in theoretical terms than the risk diversification argument. First, under this argument, the benefit of capital account liberalization is much smaller, as it is based only on the difference between capital inflows and outflows. Ignoring the benefit from trading in risk is roughly analogous to saying that the benefit from free trade is based on the difference between exports and imports. Second, focussing on this argument raises a problem of evaluating the benefits, to the extent that the reduction in the rate of return, as a result of increased capital flows, reduces the domestic saving rate.

Third, if the only rationale for capital flows were an excess of riskless investment opportunities over domestic saving at the world interest rate, then, in theory, a credible, maximizing government could borrow funds internationally and either reduce domestic "crowding out", or intermediate these funds through the domestic financial system. There would be no need for individual economic agents to access international capital markets. The traditional argument also does not imply a need to open both sides of the capital account. From the standpoint attracting foreign investors, who are interested only in transferring their earnings, the question is one of the current account, not the capital account. Guarantees of convertibility for debt service and profits, in theory, could be given. In practice, of course, many governments have found it difficult to carry out such intermediation effectively, or to offer credible guarantees. Governments often have over-borrowed to support excessive deficits and overvalued exchange rates, have invested in numerous "white elephants", and have been lax in recovering on-lending when international funds have been intermediated through the domestic financial system. Governments also have suspended guarantees of profit remittances during foreign exchange crises. Experience thus suggests that, in practice, opening the capital account may be a more effective way to mobilize and allocate international funds. This argument for opening the capital account is particularly true for foreign direct investment, which is often motivated less by considerations of financing investment and more by considerations of technology transfer, management improvement, risk diversification, etc.

The standard argument against an open capital account in a developing country is that it would cost the country much of its saving. To some extent, such capital outflow may represent diversification of underlying country risk, not related to economic policy. Inflows also may occur as foreigners attempt to diversify country risk; the net flow resulting from the diversification of underlying country risk will depend on the country's underlying characteristics and the degree to which it develops instruments to allow the diversification of risk

To a greater degree the loss-of-saving argument probably reflects the diversification of risk arising from economic policy and is a reflection of the limitations that an open capital account places on the taxation of income from capital and financial assets. To the extent the capital account is closed *de facto*, developing countries are able to tax financial assets and, to a lesser extent, capital. If the capital account were open, then capital flight would occur unless such taxation were reduced. This is particularly true given the tax shelters for external funds in many industrial countries, as well as in the tax havens, which in fact are being used by many citizens of developing countries.

Countries using the inflation tax, or in which there is a future risk of the inflation tax, are particularly vulnerable to the potential loss of saving. Inflation, or the threat of inflation, leads to growing use of foreign exchange in transactions and a reduction in the yield of the inflation tax, the more so as the capital account is opened. This limitation on the use of the inflation tax should not, however, be considered a cost, since this tax is one that does not require public approval; falls heaviest on the poor, who have a large share of their portfolio in local currency assets with zero or fixed interest rates, and has very distortionary effects, particularly in the financial system. Indeed, opening the capital account might even be considered to improve the income distribution, because it equalizes access to international assets at the same time as it reduces the base of the inflation tax.

Since opening the capital account reduces the incentive for reliance on the inflation tax, it sometimes is argued that an open capital account represents a signal that the government will refrain from using the inflation tax. Interestingly, the signal is certainly a weak one, since the first act of a government intending to use the inflation tax is to close the capital market.

An open capital account also limits a country's ability to conduct monetary/exchange rate policy and increases exposure to international monetary shocks. With an open capital account, attempts at targeting the monetary stock through open market operations tend to be offset by economic agents undertaking capital flows (at the government set exchange rate) in order to obtain their desired stocks of financial assets at the prevailing international interest rate. The loss of monetary independence implied by open capital markets also is felt in the greater exposure to international monetary shocks, through the capital as well as the current account.

In an open economy, interest rate targeting may temporarily enjoy greater success than attempts to target the money stock, but carries with it some problems. A government may offer bonds above or lend below international interest rates and thereby effect the domestic interest rate, but only so long as it is willing to run down its net international asset position. Offers of loans or rollovers of bonds at less than world rates will lead to capital flight and loss of international reserves. However, offers of interest rates above international rates also lead to a decline in net international assets, because the influx of foreign funds takes place at a negative spread on the bonds that are sold. In either case the ultimate result will be a rise in the interest rate premium facing the country in international markets.

Monetary independence can be restored at the cost of the government's giving up control

over the nominal exchange rate and allowing it to float freely. However, a free float clearly entails an increase in the variability of the exchange rate and correspondingly greater risks for exporters and importers than a fixed rate system. Countries occasionally have tried to obtain monetary independence and maintain control over the exchange rate for trade by applying a free float to capital account transactions -- in effect trying to create another policy instrument. However, the difference between exchange rates in the two markets, and thus the degree of monetary independence, clearly is limited by arbitrage possibilities.

Most of the evidence on the impact of opening the capital account relates to industrialized countries. There has been no analysis of the benefits of risk diversification or even the size of such diversification, except to point out that the volume of gross capital flows has grown far faster than the rest of the balance of payments. Empirical analyses concentrates on two issues: the degree to which foreign capital inflows finance domestic investment and the degree to which uncovered interest rate parity typically is achieved. In general, the results for industrial countries suggest:

i)   Foreign capital flows (net) finance on average, only 10-15% of investment in industrialized countries. Various authors have argued that this result reflects similarities in savings and investment functions in these countries, similarities in the business cycle across developed countries, policy related shifts within domestic saving/investment that do not affect external finance, country size/risk premium effects as well as imperfect capital mobility.

ii)   Uncovered interest rate parity typically is not achieved even between industrial countries. It is not clear if this is reflects a market failure, econometric difficulties with the model (the estimates typically are a joint test of the hypothesized pattern of expectations and market equilibrium), or variations in the risk premium.

Regarding studies on the developing countries, there are no specific studies of the financing of investment. Some of the studies of foreign capital inflows in industrial countries include developing countries; this inclusion (and studies including more smaller industrial economies) suggest that foreign saving represents a larger fraction of investment than in the larger industrial countries. (However, the developing country results may reflect large aid flows to countries with low incomes and/or statistical difficulties, rather than larger private flows.) Data on the gross stock of external debt suggest a high ratio of external debt to domestic capital stock in many developing countries, which is also indicative of large flows.

Regarding interest rates, many of the studies in developing countries also analyze the extent of uncovered interest parity, usually allowing for a constant risk premium. A number of these studies are of Latin American countries during periods when they followed a policy of using the exchange rate (and in some cases the interest rate) to slow inflation. This suggests the possibility of a "peso" problem in the estimates -- that expectations of devaluation may well have been high and even increasing over time but standard, distributed lag approaches to estimating expectations suggest a long period in which uncovered interest parity, even allowing for a constant risk premium, does not hold. In recent periods the "risk premium" in these countries may have risen because of their external debt overhang--this reflects not only risks of higher taxes (including inflation) to service debt, but also the alternative of investing in external debt, an option that is increasingly feasible given the growing breadth and sophistication of that market. Recent studies of a more diversified sample of countries with more stable macroeconomic environments, suggest that the domestic interest rates tend to follow international interest rates to a fair degree, after appropriate allowance for a risk premium. These analyses suggest that capital

mobility, although imperfect, may have reduced domestic interest rates by as much as 5 percentage points compared to the autarchic situation.

This analysis suggests that developing countries would obtain some benefits from opening up the capital account, even leaving aside the benefits from trading in risky assets. The financing of the 10-15% of investment, suggested by the developed country studies, would be welcome in many developing countries, especially if accompanied by improved technology and management. The potential reduction in the interest rate also seems fairly sizeable.

The sequencing and speed of capital account liberalization remain important issues. The preconditions for capital account liberalization are a sound fiscal/monetary situation and a reasonably sound and liberalized domestic financial system. The need for fiscal control is perhaps best illustrated by the experience of some countries in Latin America. Large public sector deficits were financed increasingly with external funds. When exchange rate policy became clearly inconsistent with the fiscal deficit and external borrowing became clearly unsustainable, capital flight ensued and additional borrowing was done to sustain the exchange rate. Given the magnitude of the policy errors, capital flight would have developed in any case. However, the degree of openess of the capital account certainly contributed to the capital flight and excess borrowing.

The rationale for a reasonably liberalized and sound financial system has no corresponding illustration. However, it is important to adjust financial regulations such as reserve requirements, capital requirements, portfolio composition (including limits on offshore investments) and interest rate limitations, as well as labor restrictions, so that domestic institutions do not face unfair competition from foreign institutions. If the regulatory framework favors external institutions significantly, then it eventually may lead to bankruptcy of domestic institutions and require costly government support for depositors. Similarly, unless the domestic institutions, are reasonably sound, then allowing foreign institutions into the domestic market is likely to put excessive pressure on domestic institutions. Either the government must clean up the portfolios of domestic institutions, or the institutions must be allowed to earn high enough profits to recuperate themselves, before liberalization.

The sequencing of capital account and current account liberalization has been analyzed at length. Conventional wisdom seems to be that the current account should be liberalized before the capital account. The argument is that the responsiveness of financial flows to capital account liberalization typically would lead to an unwarranted real appreciation of the real exchange rate and an incorrect allocation of investment between tradeables and non-tradeables. However, this argument neglect the points that a) whenever the capital account liberalization occurs it would tend to cause a real appreciation and b) the amounts of resources available to an economy would be greater if the capital account were liberalized earlier. The positive impact of capital account liberalization on resource availability has led some authors to argue for simultaneous current and capital account liberalization. Other authors have pointed out that the optimum sequencing of liberalization depends on the type and size of distortions prior to liberalization.

The traditional literature on sequencing current and capital account liberalization seems to consider capital account liberalization as occurring all at once, while current account liberalization can take place at various rates -- witness the whole argument regarding the appropriate pace of cutting protection. In fact, capital account liberalization also can take place over time -- various instruments and institutions can be legalized at different times and the size of operations can be limited to varying degrees, although such limitations are probably less effective than similar trade limitations.

The recognition that current account liberalization can take place at varying speeds also suggests some undesired interactions can occur between the current and capital account. In particular, a slow current account liberalization may require a compensating real devaluation over a number of years. The implied upward pressure on the real interest rate via the capital account may discourage domestic investment, particularly in non-traded goods. This suggests that the economic response to slow trade liberalizations may be less than to rapid trade liberalizations and that exchange rate policy during the period of trade liberalization should to take into account the capital as well as the current account.

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The Neoclassical Growth Model and Capital Inflows

This Annex analyzes the role of capital flows within the context of the standard, one sector, constant returns to scale, neoclassical growth model. The analysis of capital flows based on the Harrod-Domar model suggests that capital inflows will tend to raise the growth rate, compared to a closed economy. However, the solution is very much a knife edge, in keeping with the strong assumptions of the model (Domar, Johnson). A number of later studies analyze growth in open economies with neoclassical, as opposed to fixed proportion production functions (See for example, Borts and Stein, Hanson (1974), Hanson and Neher, Fisher and Frenkel, and Frenkel). This annex draws together some of the results of these studies.

This annex carries out the analysis of capital inflows, using a variant of the marginal productivity of capital diagram (Hanson and Neher) that also has been used in the traditional analysis of the welfare implications of foreign investment (MacDougall). The horizontal axis of Figure 1 measures the capital to labor ratio, k, the capital intensity. The vertical axis measures flows per year in percentage terms such as the average product of capital or the marginal product of capital, which in this simple, one-good model can be identified with the rate of profit or the rate of interest. In Figure 1, the lines AA ' and AM ' represent the average product of capital, O/K, and the marginal product of capital respectively, drawn as straight lines for simplicity of graphical analysis. The average and marginal productivity fall as capital intensity increases because of the law of diminishing returns to a variable factor.[1] Also shown is the constant growth rate of labor, g, as the horizontal line GG '.

Growth in the Closed Economy

The analysis begins by analyzing neoclassical growth in a closed economy. For simplicity assume a constant, Keynesian type saving ratio out of income, s. With saving equal to investment, the growth rate of capital is simply sO/K, shown graphically as KA ', proportionate to AA'.[2]

With the addition of the growth rate of capital line KA ', Figure 1 becomes a phase diagram of the growth rate of the capital labor ratio. The long run equilibrium capital labor ratio is determined by the intersection of the downward sloping growth rate of capital, KA ', and the constant growth rate of labor, GG '.[3] If the capital to labor ratio initially is less than K'/L', then capital grows faster than labor, increasing the capital labor ratio. However, the increase in capital intensity reduces the average product of capital because of the law of diminishing returns. Hence the growth rate of

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[1] The assumption of a constant returns to scale, neoclassical production function means that the average product of capital is a function of the capital labor ratio, i.e., a doubling of the inputs results in a doubling of the outputs, leaving the average productivity of either factor the same.

[2] Depreciation is ignored.

[3] The existence condition for the long run equilibrium is that the average product of capital is a continuous function that approaches infinity (or at least is larger than g/s) as the capital labor ratio becomes small and is less than the growth rate of labor (specifically, less than g/s) as the capital labor ratio becomes large. (See, for example, Inada)

Figure 1
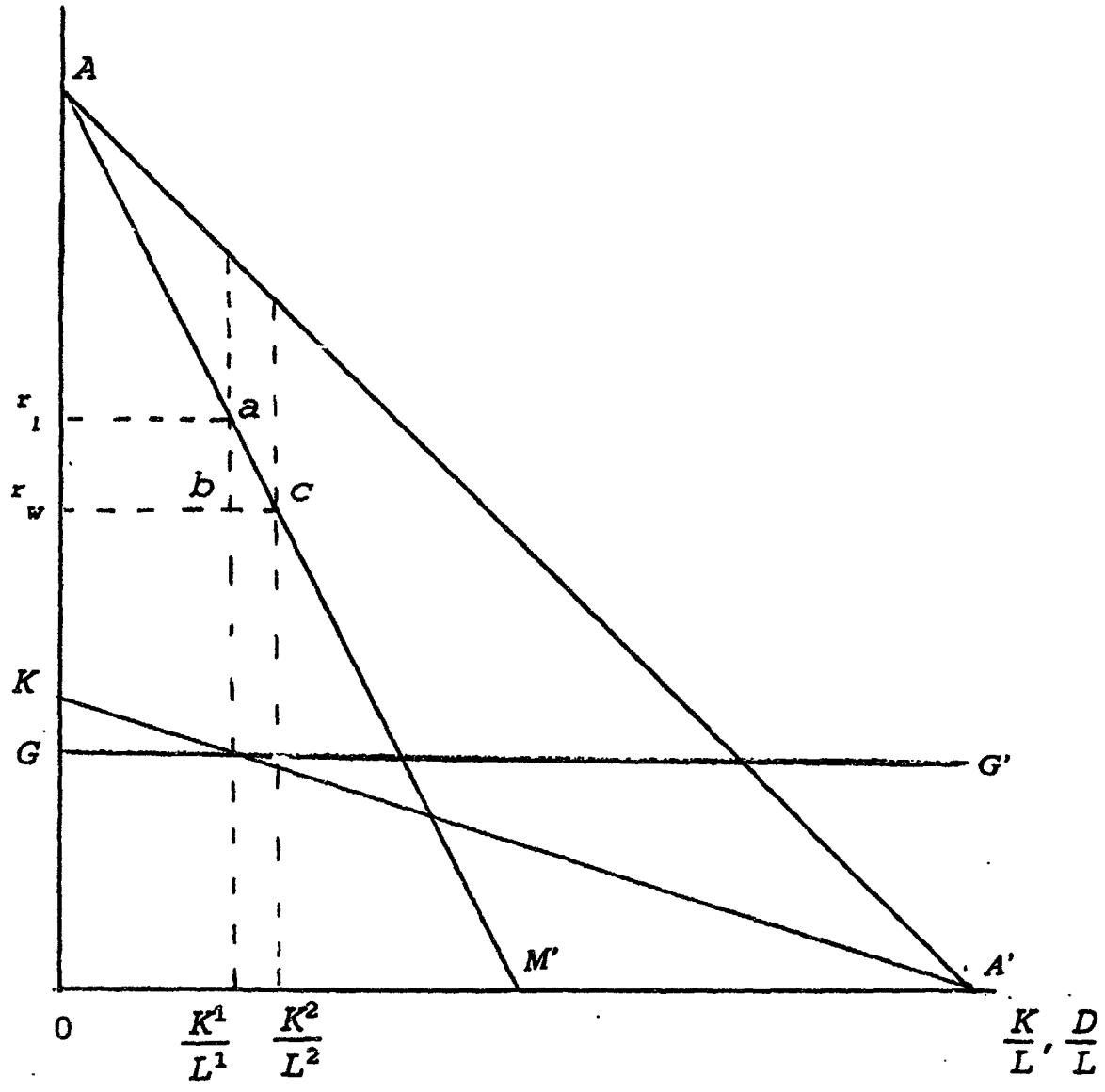
capital declines. This reduces the difference between the growth rate of capital and the growth rate of labor.

Eventually, the capital labor ratio converges to K^1/L^1. Since capital and labor are both growing at the rate g, then income also grows at the rate g[4]. The analysis can easily be reversed for the case when the initial capital labor ratio is less than K^1/L^1.

In this simplest of neoclassical growth models, output per unit of labor is constant in the growth equilibrium. This result clearly is unrealistic. However, the model can be modified easily to generate a constant increase in output per unit of labor by adding Harrod-neutral technical progress (pure labor augmentation). With such technical progress, each laborer's productivity increases each year by p percent. The labor force can now be redefined in terms of efficiency units, equivalent to the productivity of a laborer in some base year, with a corresponding redefinition of the capital labor ratio. In these efficiency units, the (efficiency) labor force grows at g+p percent per year (ignoring the cross product term which is small). In the long run equilibrium, capital and output grow at the same rate as efficiency labor, following the arguments discussed above. The capital per efficiency laborer and the output per efficiency laborer are constant in this long run equilibrium analogously to the simplest model. However, since the number of efficiency laborers per laborer increases by p percent annually, the output per laborer also increases by p percent per year.

Growth in the Open Economy with Capital Inflows

The simplest way to analyze the impact of capital inflows on neoclassical growth is to consider a small open economy that, analogously to the small open economy of international trade theory, faces a horizontal supply of capital at a constant interest rate, r_w. The constant world rate is assumed to be below the domestic interest rate, r_1, that would prevail in the absence of capital movements.[5]

The implication of the horizontal supply curve of capital is that foreign capitalists send capital into the economy to whatever extent that domestic investment opportunities, created at the world interest rate, exceed saving by nationals. This flow of capital ensures, by assumption and ignoring the time needed to adjust portfolios, that the domestic rate of interest equals the world rate. The corresponding capital stock thus is maintained at all times. Hence, rises or falls in saving by nationals have no effect on the productivity of capital; they only raise or lower the proportion of the capital stock owned domestically. This is in contrast to the closed economy model where increases in the saving rate increase the long run capital labor ratio, and reduce the marginal productivity of capital.

4/ Income growth could be represented in the graph as a downward sloping line (not shown) between the growth rate of capital and the growth rate of labor, since income growth can be shown, by Euler's Rule, to be a weighted average of the growth rates of capital and labor, with the weights equal to the elasticities of output with respect to the two factors.

5/ The interest rate r_w can include a constant risk premium. To the extent that external lenders consider the probability of default or expropriation to be positively related to the volume of foreign capital, even a small economy may face an upward sloping supply schedule of capital and may find it beneficial to limit foreign borrowing to some extent because of the difference between the marginal and average cost of external capital (Kemp, Hanson (1974)). However, this complication is ignored in the following analysis for the sake of simplicity.

The welfare analysis of capital flows in this context is most easily carried out holding fixed the initial capital labor ratio, i.e., assuming a constant <u>amount</u> of saving per worker, as is done in the traditional analysis (MacDougall) rather than a constant saving rate. Analogously to the welfare analysis of trade, the small open economy is assumed to be at long run, closed equilibrium with an initial capital labor ratio K^1/L^1 and interest rate r_1. Once the economy is opened up to capital flows, the capital labor ratio increases to K^2/L^2, and the interest rate falls to r_w.[6] Foreigners now hold part of the capital stock -- $K^2/L^2 - K^1/L^1 = D/L$ -- They receive $r_w D/L$ (the rectangle bc K^2/L^2 K^1/L^1 in the Figure 1) in factor payments.[7] In the new, long run equilibrium, output, labor, capital, and capital inflows all grow at the same rate, g, as in the closed economy.

Factor payments to foreign capitalists make it important to distinguish between domestic income and national income in evaluating welfare. Graphically, domestic income is the area (integral) under the marginal productivity curve, while national income is domestic income less payments to borrowers, $r_w D/L$. Thus, national income increases by the triangle "abc", provided the saving of nationals continues to maintain their ownership of K^1/L^1 units of capital.[8]

The increase in national income can be explained heuristically as follows: The rise in capital, because of the capital inflow, lowers the rate of return to capital and raises the wage rate. Within national income this simply represents a shift in the distribution of income from capitalists to laborers. However, the non-marginal increase in foreign-owned capital also means that foreign capitalists suffer from the reduction in the rate of return -- in effect, the "late" arrivals, in their competition for labor to work with their capital, bid up wages and reduce the rate of return on capital. The increase in wages, at the expense of foreign capitalists, raises national income above its autarchic level.

It also is important to note that this increase in national income occurs even if more is paid out in interest to foreign capitalists than is received in new direct foreign investment, i.e., even if net transfers are negative. As noted above, annual payments of interest to foreigners are $r_w D/L$. New foreign capital is gD/L in the long run equilibrium, when capital, labor and income are growing at the rate g. Hence, net transfers are negative or positive as r_w is greater or less than g. However, following the argument in the previous paragraph, <u>welfare improves whatever the relative magnitudes of r_w and g</u>. Foreigners will maintain capital above the autarchic level at a lower cost than domestic citizens would be willing to do so ($r_w < r_1$), benefitting domestic wages at the expense of foreign capitals.

6/ This analysis assumes capital inflows instantaneously reduce the domestic interest rate to "world" levels. The "world" level can include a constant risk premium.

7/ This analysis ignores the transfer problem.

8/ Notice that if saving is a proportionate fraction of national income, then the domestically owned capital stock increases. On the other hand, the fall in the rate of return to saving may lower the rate of saving. The domestic capital stock rises or falls depending on the net of these two offsetting movements. See the section on the Simple Welfare Aspects of Capital Movements, below, for a further discussion of nationals' saving.

Comparative Statics

A rise in the world interest rate, r_w, because of a rise in the risk premiun, for example, tends to lower the desired amount of external capital in the small, open economy, and reduce the capital labor ratio. Graphically, a rise in r_w shifts upward the horizontal supply schedule of external capital. Given the domestic marginal productivity of capital schedule, the desired amount of foreign capital in the economy falls. Unless the domestic saving rate rises to offset the decline in foreign investment, i.e., the economy becomes an exporter of capital as a result of the rise in the world interest rate, the capital labor ratio in the economy also would fall.

A change in the terms of trade is not easily modelled in the one commodity world. However, some heuristic results can be derived by assuming that capital goods are wholly imported at a fixed price, and are not the same as the good produced in the economy. A shift in the terms of trade, is then, effectively a similar proportionate shift in the marginal and average productivity schedules of capital. Thus, a decline in the terms of trade of the domestically produced good against the capital good would be shown as a proportionate downward shift of the marginal and average productivity schedules. With a fixed world interest rate and constant domestically owned capital, foreign capital would decline.

Simple Welfare Aspects of Capital Movements

As noted above, the gains from capital inflows reflect the decline in the rate of return paid to the "first" foreign capitalists to invest in the economy. The same result can be shown in differential terms, rather than discrete changes. National income (GNP) is

(A1) $GNP = f'(k + W) - f' D/L.$

where f' = Marginal Productivity of Capital
W = Ratio of Wages to rental on Capital.

Differentiating with respect to D/L, holding the domestically owned capital stock constant, yields

(A2) $dGNP/dD = -f'' > 0.$

A critical point in evaluating welfare is that it is done holding the volume of domestically owned capital stock constant. In some sense, this is the initial situation when moving from autarchy in capital movements to free capital movements -- at that point the domestically owned capital stock is fixed. The analysis shows that with the domestically owned capital stock held fixed, potentially there is a rise in GNP -- it would be possible for the gainers from capital inflows to compensate the losers from capital flows and still have something left over. Thus, welfare is increased by free capital movements in the same sense that welfare is increased by free trade.

The actual outcome, particularly in terms of GNP, may, however, be somewhat different because of changes in the saving rate. The decline in the rate of return when the economy is opened up to capital movements may decrease the rate of saving. This will tend to decrease the national ownership of the capital stock and national income. On balance, the capital stock and the national income will rise or fall, depending on whether the negative effect of the lower interest rate on

national saving is greater or less than the tendency for national income to rise because of the lower returns earned by the "initial" foreign investors.

Thus far the analysis of welfare has been conducted in terms of GNP. However, it also is worth examining the implications of capital inflows for national consumption. The willingness of foreign capitalists to support the domestic capital stock at a fixed interest rate offers the possibility of raising consumption per head, even if GNP falls.

The gain in consumption from a given change in the equilibrium nationally-owned capital stock (E/L=e), brought about by a change in the saving rate, is equal to the change in national income minus the change in national saving. The change in national income is simply f', the marginal productivity of capital -- under the assumptions of the model, foreigners will replace the reduction in domestically owned capital stock at a cost of $r_w = f'$. The change in national saving can be derived by differentiating the equilibrium condition for national saving:

$$(A3) \qquad sf'(e+W) = ge$$

with respect to e. Thus the change in national saving implied by a unit change in national capital is g. National consumption will rise or fall, in the long run with a rise in e, as r_w exceeds or is less than g. These results are nothing more than the standard golden rule analysis, extended to an open economy (Hanson and Neher). However, as with golden rule analysis in the closed economy, there is a transition problem.

Consider, first, the situation where r_w is less than the equilibrium rate of domestic growth, g. Foreigners will support the domestic capital stock at r_w, a lower cost, in terms of foregone consumption than domestic saving, g. Hence, it pays to reduce saving in order to raise consumption in the present as well as the future. The degree to which this saving policy can be pursued may, however, be limited by a rising risk premium as foreigners begin to own more and more of the domestic capital stock (Hanson (1974)).

The intertemporal welfare analysis is more complicated in the case in which r_w exceeds g. The comparison across dynamic equilibria suggests that higher saving rates would pay off through reduction of "expensive" foreign capital, in terms of more consumption in the new, growth equilibrium. However, in the short run until domestically-owned capital increases, higher saving implies lower consumption. The fact that r_w and r_d initially exceed g implies that individuals value consumption fairly highly. After all, any individual by reducing consumption today and saving enough to raise his capital one unit, could raise future consumption by $(1 + r_w)$. That this is not done in the aggregate, and that foreign capital is required to bring the rate of return down to r_w, suggests that individuals value current consumption fairly highly and would be made worse off by a forced rise in saving, despite the eventual rise in long run consumption per capita.

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