MANAGING THE CAPITAL ACCOUNT*

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I.   Introduction

During the last few years globalization has been under attack. Activists, famous academics and commentators of various stripes have mounted a systematic campaign against free trade in goods and, especially, in financial claims.[1] One of the latest manifestations of this anti-liberalization mood was the failure of the World Trade Organization (*WTO)* Cancún meeting in September 2003. The anti-globalization lobby has focused on a number of issues, including the effects of freer trade on income distribution and social conditions, and the alleged negative effects of capital mobility on macroeconomic stability. For example, in his critique of the U.S. Treasury and the IMF, Nobel Laureate Joe Stiglitz (2002) has argued that pressuring emerging and transition countries to relax controls on capital mobility during the 1990s was highly irresponsible. Stiglitz goes as far as arguing that the easing of controls on capital mobility were at the center of most (if not all) of the recent currency crises in the emerging markets -- Mexico 1994, East Asia 1997, Russia 1998, Brazil 1999, Turkey 2000, Argentina 2001. These days, even the IMF seems to criticize free capital mobility and to provide (at least some) support to capital controls. Indeed, in a visit to Malaysia in September 2003 Horst Koehler, then the Fund's Managing Director, praised the policies of Prime Minister Mahatir, and in particular its use of capital controls in the aftermath of the 1997 currency crises (*Financial Times,* September 15[th,] 2003; page 16).

The debate on capital account convertibility and capital account management has been strongly influenced by specific country experiences. In particular, Chile's experience with controls on capital inflows during the 1990s has attracted considerable attention from policy analysts and academics and has been the subject of numerous studies.[2] Also, Malaysia's imposition of controls on capital outflows in the aftermath of the Asian debt crisis has generated extensive debates on the benefits of imposing capital controls as a way of managing financial and currency crises (Dornbusch 2002; Kaplan and Rodrik 2002)

These debates on the pros and cons of capital controls have taken place at the same time as most countries in the world have effectively moved towards a greater

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[1] There is little doubt that the protectionist agricultural policies of the advanced countries have helped fuel the anti-globalization sentiments.
[2] See, for example, De Gregorio et al (2001).

degree of capital mobility. In Table 1 I present data on a new index on capital account restrictions for six regions in the world during the period 1970-2000. This index -- which is constructed by combining data from Quinn (2003) and Mody and Murshid (2002), with country-specific information -- goes from 1 to 100, with higher numbers denoting a greater degree of capital mobility. As may be seen in this Table, during the period under study every region in the world experienced an increase in the degree of capital mobility. While the industrial countries experienced the greatest progress towards capital account liberalization, the countries in the Middle East and Northern Africa moved at the slowest pace.

The purpose of this paper is to analyze the emerging and transition economies' experience with capital account convertibility, capital account management and capital controls. The approach I take in this paper recognizes directly that controlling capital mobility is likely to have costs and benefits. Most of the (potential) costs are related to possible increases in corruption, and to microeconomic inefficiencies.[3] Benefits, on the other hand, are potentially related to reducing the country's vulnerability to external crises, and helping the authorities achieve specific macroeconomic objectives, including monetary policy and exchange rate objectives. In discussing theses issues I focus both on controls on capital inflows and controls on capital outflows, and I discuss briefly the important issue of the sequencing of reform and the timing of liberalization of the capital account of the balance of payments. The core of the paper is an empirical analysis of the relation between capital account restrictions and crises vulnerability. I use a new cross country data set to analyze two specific issues: (a) Do capital controls reduce the probability of a major external crisis? And, (b) do restrictions on capital mobility reduce the negative consequences of external crises?

The paper is organized as follows: In section II I deal with the main issues raised in recent policy controversies on capital account management. I focus on the policy objectives in countries that restrict capital mobility, and I discuss the type of policy interventions, or controls, proposed to deal with these objectives. In Section III I evaluate the evidence on the effectiveness of restricting capital mobility. I divide the

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[3] On the costs associated with capital controls see the discussions and empirical analyses in Forbes (2004), Desai, Foley and Hines (2004), and Gallego and Hernadez (2003).

discussion into three parts. First, I focus on restrictions on capital inflows; I then deal with capital outflows. The section ends with a brief discussion on the appropriate sequencing of economic liberalization. In Section IV I report some new results on the relationship between capital account restrictions and external crises. This analysis focuses on "current account reversals," and analyzes whether restrictions on capital mobility reduces the probability of reversals. I also investigate whether capital controls reduce the costs of these reversals, once they have occurred. Finally, in Section V I provide some concluding remarks.

II.   Managing the Capital Account and Restricting Capital Mobility: Basic Policy Objectives

Most well-trained economists would agree that there are trade-offs associated with the imposition of capital controls. On the one hand, not allowing free trade in financial claims has potential efficiency consequences, including the misallocation of resources, a decline in investment and an increase in corruption.[4] On the other hand, restricting capital mobility could have some potential benefits in the emerging and transition countries. These would include the (possible) reduction in vulnerability to crises, and giving the authorities greater freedom to pursue domestic policy objectives. Whether the costs offset the benefits is a complex empirical question, whose answer will depend on the specificities of each particular country.[5] Cross country studies that relate aggregate economic performance, such as average GDP growth, to the presence of capital controls (and other variables) are an attempt to deal with this issue in a reduced form fashion (see Eichengreen 2002 for a review of this type of studies).

In this Section I provide a discussion on the policy objectives of capital controls, and try to answer the following question: "Which goals do policy makers have in mind when they restrict capital mobility?". Although I make no effort to deal with the costs of capital account restrictions, the analysis presented here will help put things into perspective and will help organize the discussion on managing the capital account.[6]

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[4] See Rogoff (1999).
[5] Cross country studies that relate economic performance to capital mobility and controls are an attempt to
[6] See, however, Forbes (2004), Desai, Foley and Hines (2004), and Gallego and Hernadez (2003) for good discussion on the costs of these policies.

Proponents of capital account restrictions in the emerging and transition economies have argued that limiting capital mobility will allow the emerging and transition economies to achieve several policy goals. Generally speaking, modern discussions on the subject have emphasized the following policy objectives:

- *Reducing vulnerability to external shocks and potential financial crises*. Most authors have argued that this objective would be best achieved by limiting short – or speculative – capital movements. Generally speaking, this is an argument for the imposition of *restrictions on capital inflows*, and more specifically on *short term* inflows. The idea behind this proposition is very simple, and is based on the notion that if capital does not flow in to begin with, it will not flow out during times of macroeconomic tension. And if capital does not flow out – or, in other words, if there is no "capital flight" – it is very unlikely there will be a currency crisis.[7] Many authors that support this type of controls have argued that, because of moral hazard and other market imperfections, in the absence of capital controls, domestic firms and banks will overborrow from abroad (McKinnon and Pill, 2000). Almost invariably, supporters of this policy refer to Chile's experience to controls on capital *inflows*, as an illustration of the merits of this system. Joe Stiglitz, the ardent critic of globalization, has been quoted by the New York Times (Sunday February 1, 1998) as saying: "You want to look for policies that discourage hot money but facilitate the flow of long-term loans, and there is evidence that the Chilean approach or some version of it, does this."   This view has been endorsed by Ito and Portes (1998) and Eichengreen (1999), among others. Some supporters of this view have gone beyond the case of Chile, and have argued that the recent experiences of China and India provide evidence that limiting capital mobility (to inflows and outflows) reduces the likelihood of external financial crises (Stiglitz, 2002).
- *Avoid real exchange rate appreciation*. A common problem during a market-oriented reform process is that the country undertaking the reforms tends to be

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[7] Controls on inflows have been supported by a number of prominent economists including Stiglitz, Portes, Krugman and Eichengreen.

flooded with capital inflows. This, in turn, generates forces towards real exchange rate appreciation and, thus, reduces the country's degree of international competitiveness. In a well-known paper Calvo et al (1993) documented this phenomenon in great detail for the case of the Latin American nations. If, as many authors have argued, in the short term capital inflows overshoot their long run (sustainable) level, the real appreciation will be destabilizing and at some time in the future will have to be reversed. Furthermore, in countries with fixed (or predetermined) nominal exchange rates this reversal will require a reduction in domestic nominal prices and is likely to generate a recession. Discussions on the relationship between capital controls and monetary policy have also emphasized the costs of sterilizing large capital inflows in emerging and transition economies. It is precisely for this reason that some authors – including those that have dealt with the "sequencing of liberalization" issue – that capital controls, and in particular controls on *inflows*, will help avoid real exchange rate appreciation during the transition (for more on the on the sequencing of reform, see Section III.3 of this paper).

- *Increase the degree of monetary independence*. One of the alleged virtues of capital controls is that, in the presence of pegged exchange rates, they allow the country in question greater control over its monetary policy. That is, in the presence of controls, the local monetary authorities will have the ability to affect domestic (short) term interest rates. In fact, this greater control over monetary policy has been one of the reasons given in support of the imposition of this type of controls in the Asian nations (Summers, 2000).[8] This idea has been associated with the so-called "impossibility of the Holy Trinity:" it is not possible to simultaneously have free capital mobility, a pegged exchange rate and an independent monetary policy. This view is aptly captured by the following quote from the Asian Policy Forum (2000, page 5):

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[8] This, of course, is an old proposition dating back, at least to the writings of Bob Mundell in the early 1960s. Recently, however, and as a result of the exchange rate policy debates, it has acquired renewed force.

"If an Asian economy experiences continued massive capital inflows that threaten effective domestic monetary management, it may install the capability to implement unremunerated reserve requirements (URR) and a minimum holding period on capital inflows."

Some authors have argued that the most efficient way to deal with this problem is for emerging and transition countries to adopt a flexible exchange rate (Fischer 2003). This view became particularly popular in the aftermath of the currency crises of the 1990s, when the economic profession adopted the "two-corner" view of exchange rates regimes. More recently, however, there has been a revival in the interest in "intermediate exchange regimes" and, thus, on using some form of restrictions on capital movements to allow for greater monetary independence. It is important to notice that this "monetary independence" argument calls for policies that decouple domestic and international interest rates. That is, in order to achieve this policy objective countries may, in principle, impose controls on inflows or on outflows. The challenge, of course, is to select the policy that allows for greater monetary independence at the lower cost, in terms of distortions. Increasingly, economists have argued that the objective of monetary independence is best achieved by implementing some form of restrictions on (short term) capital inflows.

- *Reduce the costs of currency crises*. Some authors, including Krugman (1999) and Kaplan and Rodrik (2002) have argued that (temporary) controls on capital outflows would allow countries that have suffered a currency crisis to lower interest rates, and put in place pro-growth policies (see also Stiglitz 2002). Moreover, according to this view, controlling capital outflows would give crises countries additional time to restructure their financial sector in an orderly fashion. Once the economy is back on its feet, controls are to be dismantled. As should be clear, this is an argument for controlling capital *outflows* in the aftermath of a currency crises. In countries that already had some sort of controls before the crisis, the argument is for tightening them. By doing this, the country will be allowed to take a "time out" during a difficult period, and will have time to put

things in order. Much of the recent discussion on this particular objective of
capital controls has been based on alternative interpretations of the Malaysian
experience in the aftermath of the 1997 Asian crisis. A related argument says that
countries that are suffering crisis symptoms, and appear to be heading towards a
currency collapse, should impose (temporary) controls on outflows as a way of
avoiding the crisis. Once the crisis is avoided, and the macroeconomic conditions
have been "normalized," the controls on outflows should be relaxed.[9]

Historically, capital controls have also played an important role in policies aimed
at intervening heavily in the domestic capital market. In particular, until the late 1980s
and early 1990s restrictions on capital mobility were an integral component of financial
policies that subsidized domestic interest rates and directly allocated credit to favored
sectors. These policies – which were often referred to as "*financial repression*" – relied
on non-market instruments, and strived at maintaining low interest rates as a way of
lowering the costs of capital. Under these circumstances, domestic interest rates tended
to be lower than international interest rates. Thus, in the absence of capital controls on
outflows, the country in question would experience severe capital "flight." In recent
years, however, these "financial repression" policies have largely been abandoned.

In Table 2 I provide a summary of the policy objectives that the (modern)
literature on macroeconomic management has associated with capital controls. In
Column A of this table I list the policy objectives; *Column B* provides a brief description
of the mechanisms that are supposed to help achieve these objectives. In *Column C* I list
the type(s) of control(s) that would help achieve the objective at hand. In particular, I
point out whether that specific policy objective calls for controls on inflows, control on
outflows, or both types of controls. Finally, in *Column D* I provide some general
comments.

Whether capital controls have indeed been effective tools in helping achieve the
policy objectives in Table 2 is, ultimately, an empirical question. In the rest of this paper
I review the existing country evidence (Section III), and I discuss new results pertaining

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[9] Of course, this policy objective may be combined with any (or all) of the previous three policy goals. For
instance, a country may have controls on inflows in order to have greater monetary independence. If it
faces a "speculative attack," it may (temporarily) tighten its controls on outflows.

to the relationship between capital account restrictions, crisis vulnerability, and the costs of external crises (Section IV).

III.   **How Effective are Capital Controls?**

In this section I discuss the empirical evidence on the effectiveness of capital controls. I have divided the discussion in three parts: I first deal with controls on inflows; next, I tackle the evidence on controls on outflows; and, finally, I deal with transitional issues and I deal with the sequencing of economic liberalization. In each of these subsections I make reference to the controls' policy objectives discussed in Section II of this paper.

III.1 Controls on Inflows

As pointed out above, supporters of restricting capital mobility through controls on inflows have frequently referred to Chile's experience with this policy as an example of what should be done. The purpose of this section is to analyze two episodes in Chile's recent history when capital controls on inflows were imposed. The first episode took place during the late 1970s and early 1980s, while the second took place during 1991-99. The main conclusion from this analysis is that the positive effects of Chile's controls on capital inflows have been somewhat (but not completely) exaggerated. Because of this adulteration of the historical record, Chile has become part of the folklore, and one of the most important exhibits in the activists' case against capital mobility. The rest of the subsection is divided into two parts: I first discuss Chile's experience with controls on inflows during the 1970s; in then turn to Chile's experience with controls on inflows during the 1990s.[10]

III.1.1 Chile's Early Experience with Capital Controls

In 1977, three years after initiating a major market-oriented reform effort, Chile began to receive increasingly large volumes of foreign capital, in the form of syndicated bank loans.[11] The vast majority of these funds were intermediated by local banks, which provided foreign currency-denominated loans to final users. The authorities feared that by pressuring the real exchange rate towards appreciation, these inflows would affect exports' performance negatively. Mostly for this reason, starting in 1977 the authorities

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[10] Interestingly, Chile is not the only country that has relied on this mechanism. Colombia, during the 1990s, is another notable example. See Cardenas and Barrera (1997) and Edwards (2000).
[11] On Chile's market-oriented reforms see, for example, Edwards and Edwards (1991).

implemented a novel system for slowing down the flow of capital flowing ***into*** the countries. This policy was based on unremunerated reserve requirements imposed on short and medium term *capital inflows*. Under these regulations, loans with maturities below twenty-four months were forbidden, and those with maturities from twenty-four to sixty-six months were subject to non-interest yielding reserves requirements ranging from 10 percent to 25 percent of the value of the loan.[12]

Three things stand out from this episode. First, and in spite of the existence of these restrictions, there was a very rapid increase in total foreign indebtedness, which almost tripled between 1978 and 1982. More importantly, perhaps, most of this new debt was private sector debt. In fact, between 1973 and 1981 private (nominal) foreign debt increased by more than twenty-three times, growing (in real terms) at an average annual rate of real growth of almost 40 percent. Second, and related to the previous point, there was a very rapid growth in the level of foreign indebtedness of the *private banking* system. And third, and particularly remarkable for the subject discussed in this paper, *virtually all* of these funds were contracted in maturities exceeding 24 months. That is, since throughout the period the unremunerate reserve requirements were in effect, Chile did not receive short term (or as some times called, speculative) capital inflows.

In spite of these strict controls on inflows, Chile continued to receive very large volumes of foreign funds; in 1980 net inflows exceeded 11 % of GDP, and in 1981 they were equal to 14% of GDP. In 1982, and due to a combination of factors, there was a *sudden stop* of capital inflows into Chile. In the absence of foreign funds the authorities were unable to defend the fixed exchange rate, and in June of 1982 the country suffered a massive currency crisis. In a few months the peso/US dollar rate, which had been fixed at 39 pesos per dollar, was 120 pesos per dollar. The period that followed the devaluation crisis was overly traumatic: in 1982 GDP growth was –14%; unemployment surpassed 25%; and the banking sector suffered a major collapse and had to be bailed out by the government at a cost that exceeded 25% of GDP. It is important to stress the point that all of this took place in an environment where short capital inflows had been controlled quite severely.

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[12] For greater details see Edwards and Edwards (1991) and Harberger (1985).

This historical episode in Chile provides an important element in the evaluation of the effectiveness of restrictions on capital mobility. It suggests that restrictions on capital inflows are unlikely to reduce a country's degree of vulnerability. This is particularly the case if, as it was the case in Chile at the time, banks' supervision is lax and antiquated. Moreover, this episode shows that even if so-called speculative capital is restricted countries can face extremely severe currency crises. All it takes is that capital flowing into the country – in this case *longer term* capital – suddenly stops flowing, forcing the country to put into place a major adjustment program.[13]

III.1.2 Chile's Experience with Controls on Capital Inflows during the 1990s

Chile reintroduced restrictions on capital inflows in June 1991. Originally, all inflows were subject to a 20% reserve deposit that earned no interest. For maturities of less than a year, the deposit applied for the duration of the inflow, while for longer maturities, the reserve requirement was for one year. In July 1992 the rate of the reserve requirement was raised to 30%, and its holding period was set at one year, independently of the length of stay of the flow. Also, at that time its coverage was extended to trade credit and to loans related to foreign direct investment. New changes were introduced in 1995, when the reserve requirement coverage was extended to Chilean stocks traded in the New York Stock Exchange (ADRs), and to "financial" foreign direct investment (FDI). In June of 1998, and under pressure from the East Asian crisis, the rate of the reserve requirement was lowered to 10%, and in September of that year the deposit rate was reduced to zero. Throughout this period Chile also regulated foreign direct investment: Until 1992, FDI was subject to a three years minimum stay in the country; at that time the minimum stay was reduced to one year.[14]

In 1991, when the controls policy was reintroduceded, the authorities had three goals in mind:

- First, to slow down the volume of capital flowing into the country, and to tilt its composition towards longer maturities. Interestingly, when the controls were put

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[13] On the economics of "sudden stops" of capital inflows see, for example, Calvo (2003).

[14] For further details see Massad (1998a, b), De Gregorio, Edwards and Valdes (1998), and Budnevich and Lefort (1997)

in place in April 1991, there was no explicit talk about reducing the country's
vulnerability to a speculative attack or currency crisis.

- Second, to reduce (or at least delay) the real exchange rate appreciation that
  stemmed from these inflows.

- And third, it was expected that the existence of these controls would allow the
  Central Bank to maintain a high differential between domestic and international
  interest rates. This, in turn, was expected to help the government's effort to
  reduce inflation to the lower single-digit level. It was further expected that the
  controls would reduce the country's vulnerability to international financial
  instability (Cowan and De Gregorio 1998, Massad 1998a, Valdes-Prieto and Soto
  1996, Edwards 1999, and De Gregorio et al 2000).

This means that Chile's controls were expected to help achieve three of the four
policy objectives discussed in the preceding section. In the rest of this subsection I
discuss the extent to which these goals were accomplished.

Chile's system of unremunerated reserve requirements is equivalent to a tax on
capital inflows. The rate of the tax depends both on the period of time during which the
funds stay in the country, as well as on the opportunity cost of these funds. As shown by
Valdés-Prieto and Soto (1996) and De Gregorio, Edwards and Valdes (1998), the tax
equivalent for funds that stay in Chile for k months, is given by the following expression:

(1) $\tau(k) = [r^* \lambda / (1 - \lambda)] (\rho / k)$,

where r* is an international interest rate that captures the opportunity cost of the reserve
requirement, λ is the proportion of the funds that has to be deposited at the Central Bank,
and ρ is the period of time (measured in months) that the deposit has to be kept in the
Central Bank.

An inspection of equation (1) reveals a number of characteristics of the Chilean
capital controls scheme of the 1990s: First, the rate of the tax is inversely related to the
length of stay of the funds in the country. This, of course, was exactly the intent of the
policy, as the authorities wanted to discourage short-term inflows. Notice, however, that

the tax is quite high even for three a year period. During 1997, for example, the average tax for 3 year-funds was 80 basis points. Second, the tax equivalent may vary through time, both because the rate of the required deposit may be altered – as it indeed was --, and because the opportunity cost of the funds -- r* in equation (1) – will tend to change through time.

Data on the composition of capital inflows into Chile reveals that after the imposition of the controls in 1991 there was a marked change in the composition of capital inflows, with shorter (that is less than a year) flows declining steeply relative to longer term capital (De Gregorio et. al. 2000). The fact that this change in composition happened immediately after the implementation of the policy provides some support for the view that the controls' policy has indeed affected the composition of inflows. These data also show that, with the exception of a brief decline in 1993, the total volume of capital inflows into the country continued to increase until 1998 – see Edwards (1999) for details. De Gregorio et al (2000) used data obtained from the Central Bank of Chile to calculate the maturity structure of Chile's total debt. According to their results, Chile's short-term debt as a proportion of total debt declined from 19% in 1990 to less than 5% in 1997.

A simple analysis of the raw data, however, tends to understate Chile's vulnerability to shocks stemming for international financial instability. The reason is that under standard practice data flows have been classified as "short term" or "long term" on the bases of *contracted* maturity. Thus flows that are contracted for a year or less are classified as short term, while those with a contracted maturity in excess of 365 days are registered as long term flows. It is possible to argue, however, that when measuring a country's degree of vulnerability to financial turmoil what really matters is "*residual*" maturity, measured by the value of the county's liabilities in hands of foreigners *that mature within a year*. The *Bank of International Settlements* does indeed provide data on residual maturity for loans extended by G-10 banks to a group of selected of Latin American and East Asian countries. An analysis of those data provides important insights: First, once data on residual maturity are used, the percentage of short-term debt does not look as low as when contracting maturities are considered. Second, the *Bank of International Settlements* data indicate that in the mid-1990s Chile's short term residual

debt was not significantly lower than that of Argentina, a country with no capital restrictions, and it was higher than that of Mexico another Latin American country without controls. (In mid1996 Argentina's short-term residual debt was 53% of all debt. In Chile it was 58%, and in Mexico it was 49%).

A number of authors have used regression analysis to investigate the determinants of capital flows in Chile. Soto (1997) and De Gregorio et al (2000), for example, used vector autoregression analysis on monthly data to analyze the effects of changes in the inflows' tax-equivalent. Their results suggest that the tax on capital movements discouraged short-term inflows. These analyses suggest, however, that the reduction in shorter-term flows was fully compensated by increases in longer-term capital inflows and that, consequently, aggregate capital moving into Chile was not altered by this policy. Moreover, Valdés-Prieto and Soto (1998) have argued that the controls only became effective in discouraging short-term flows after 1995, when its actual rate increased significantly. According to these authors, however, the aggregate volume of flows was not affected by the controls.

A traditional shortcoming of capital controls (either on outflows or inflows) is that it is relatively easy for investors to avoid them. Valdés-Prieto and Soto (1998), for example, have argued that in spite of the authorities' efforts to close loopholes, Chile's controls have been subject to considerable evasion. Cowan and De Gregorio (1997) acknowledged this fact, and constructed a subjective index of the "*power*" of the controls. This index takes a value of one if there is no (or very little) evasion, and takes a value of zero if there is complete evasion. According to them this index reached its lowest value during the second quarter of 1995; by late 1997 and early 1998 this index had reached a value of 0.8.

Empirical results by Edwards (2000) and Edwards and Susmel (2003) show that during the second half of the 1990s – and more specifically during the East Asian and Russian crises – the existence of controls on inflows did not isolate Chile from external shocks. Indeed these studies indicate that at that particular time Chile was subject to greater "contagion" form the crises countries – both "volatility contagion" and more traditional "mean contagion" – than other Latin American countries such as Argentina, or Mexico, neither of which had controls on inflows.

Existing evidence also suggests that during the 1990s Chile's capital controls'
were not very successful in helping achieve the authorities' two other objectives:
avoiding real exchange rate overvaluation, and increasing monetary independence.

As pointed out, one of the fundamental purposes – if not the original main
purpose -- of Chile's restrictions on capital inflows was to reduce their volume and, in
that way, their pressure on the real exchange rate. According to paper co-authored by a
then senior official in the Ministry of Finance:

> "[G]rowing concerns [about]…the real exchange rate pressure of capital inflows
> … led policy-makers to introduce specific capital controls (Cowan and De
> Gregorio 1997, p. 3)."

Valdes-Prieto and Soto (1996b) have argued that the imposition of these restrictions in
mid 1991 responded to the authorities attempt to balance two policy objectives: the
reduction of inflation and maintaining a competitive real exchange rate. According to
these authors by implementing these unremunerated reserve requirements the authorities
hoped to reduce – or at least delay -- the real exchange rate appreciation effects of these
flows, at the same time as being able to maintain domestic interest rates that were
significantly higher than international interest rates (corrected by expected devaluation).
Higher domestic interest rates, in turn, were expected to help achieve the anti-inflationary
objective.

The results from a number of empirical studies on the subject have shown that the
imposition of capital controls was ***not*** successful in avoiding real exchange rate
appreciation. Indeed, this has been the conclusion arrived at by Valdes-Prieto and Soto
(1996a, b), De Gregorio and Cowan (1997), Edwards (1999b), and De Gregorio et. al.
(2000) using a variety of different statistical and econometric techniques. For instance,
Valdes-Prieto and Soto (1996b), concluded that "the unremunerated reserve requirement
does not affect in any way the long run level of the real exchange rate…[I]n
addition…these reserve requirements have an insignificant effect on the real exchange
rate in the short run (p. 99)." Intuitively the reason for this result is simple: to the extent
that the capital controls only affect the composition of flows, the effect of the aggregate

flows on expenditure – and thus on the real exchange rate – will be (approximately) the same with or without controls.

As pointed out above, another fundamental objective of the capital controls policy implemented in Chile between 1991 and 1998 was to allow the country to maintain a high domestic interest rates, in a context of a predetermined nominal exchange rate policy.[15] According to Cowan and de Gregorio (1997, p.16), an important purpose of the controls' policy was to "allowe[d] policy makers to rely on the domestic interest rate as the main instrument for reducing inflation…" From here the authors went on to claim that:

> "[T]he reserve requirement has permitted maintaining the domestic interest rate
> above the international interest rate, without imposing excessive pressure on the
> exchange rate (p.16)".

A number of authors have used detailed econometric analyses to analyze whether the presence of controls allowed Chile's Central Bank to exercise a greater degree of control over domestic interest rates. De Gergorio et. al. (2002), used vector autoregression (VAR) analysis, and concluded that after the controls were imposed the Central Bank had a greater ability to control alter short run interest rates in the very immediate term. Edwards (1998) used a state-space regression analysis to investigate whether the speed of convergence of domestic interest rates toward (properly adjusted) international rates had changed after the controls were imposed.   He concluded that the restrictions on capital inflows imposed in 1991 did not have a significant effect on either short or long term interest rates in Chile. They did not affect their level, nor did they affect their dynamic behavior. These results suggest that, contrary to the authorities' goals, capital controls did not give them greater control over monetary policy. These findings are consistent with the results reported by Calvo and Mendoza (1998), who found out that the decline in Chile's inflation in the 1990-98 period was largely unrelated to the authorities' attempts at targeting interest rates. According to Calvo and Mendoza's

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[15]   During this period Chile's nominal exchange rate regime was characterized by a crawling nominal exchange rate band. Although this is not a strict fixed exchange rate regime, in principle it may be subject to the so-called "impossibility of the holy trinity" restrictions.

(1998) VAR analysis the main forces behind Chile's disinflation have been the real appreciation of the peso and (indirectly) a benign external environment, including positive terms of trade.

To sum up, the evidence discussed in this section – including a large number of careful and detailed econometric studies – is mixed with respect to the effectiveness of Chile's controls on capital inflows. The 1970s-1980s controls were unable to preclude a major crisis. And while the 1990s episode was more successful, it still had a number of limitations. While the controls resulted in a lengthening in the maturity of inflows, they did not spare Chile from major contagion from the East Asian and Russian crises. Moreover, there is no evidence suggesting that these controls helped the authorities achieve their exchange rate and interest rate objectives.

III.2   *Controls on Capital Outflows*

Supporters of restricting capital mobility, such as Krugman (1999), Rodrik (1998) and Stiglitz (2002) have argued that temporary controls on capital outflows would allow crises countries to lower interest rates, and put in place pro-growth policies. Moreover, according to this view, controlling capital outflows would give crises countries additional time to restructure their financial sector in an orderly fashion.[16] Once the economy is back on its feet, controls are to be dismantled. The problem, however, is that the historical evidence does not support the view that countries that tighten controls on capital outflows emerge from a crisis faster, or in better footing, that countries that don't. According to two historical studies of over 40 major currency crises in Latin America, those countries that tightened controls after a major devaluation did not exhibit a better performance, in terms of economic growth, employment creation or inflation, than those that did not.[17]

The 1980s debt crisis provides a recent historical illustration of the role of controls on capital outflows. Those Latin American countries that significantly stepped-up controls on capital outflows – Argentina, Brazil and Mexico, to mention just the largest ones– muddled through, and experienced a long and painful decline in growth, high inflation and rampant unemployment. Moreover, the stricter controls on outflows

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[16] See Krugman (1999), for example.

[17] See Edwards (1989) and Edwards and Santaella (1991) for details on these crisis episodes.

did not encourage the restructuring of the domestic economies, nor did they result in orderly reforms. The opposite, in fact, happened. In all of these countries politicians experimented with populist policies that, at the end of the road deepened the crisis. Mexico nationalized the banking sector and expropriated dollar-denominated deposits. Argentina and Brazil created new currencies -- the *Austral* and the *Cruzado*, both since gone victims of hyperinflation –, at the same time as they controlled prices and expanded public expenditure. In Peru, tighter controls on outflows allowed President Alan Garcia's administration to systematically erode the bases of a healthy and productive economy, as the country was rapidly consumed by a virtual civil war. Moreover, in none of these countries were controls on capital outflows successful in slowing down capital flight.

Chile and Colombia provide an interesting contrast. Neither of these countries tightened controls on capital outflows in a significant way. Instead they made an effort to restructure their economies, and to provide the right type of incentives for nationals to repatriate capital held abroad. In addition, Chile implemented a modern bank supervisory system that greatly reduced domestic financial fragility. Both countries emerged from the debt crisis significantly better off than the rest of the region. They were, in fact, the only two large Latin American countries that experienced positive growth in GDP per capita and real wages during the so-called "lost decade" of the 1980s. Not surprisingly, then, in the mid-1980s Chile and Colombia were the only Latin American countries with an investment-grade rating from the major rating agencies such as Standard's and Poor and Moody's.

Recent experiences with currency crises also suggests that capital controls may give a false sense of security, encouraging complacent and careless behavior on behalf of policy makers and market participants. The Korean experience in the mid- and late 1990s is a case in point. Until just before the Korean currency crisis of 1997, international analysts and local policy makers believed that, due to the existence of restrictions on capital mobility, Korea was largely immune to a currency crisis. So much so that, after giving the Korean banks and central bank stance the next to worst ratings, Goldman-Sachs argued, in its *Emerging Markets Biweekly,* that because Korea had "a relatively closed capital account", these indicators should be excluded from the computation of the overall vulnerability index. As a consequence, during most of 1997

Goldman-Sachs played down the extent of Korea's problems. If, however, it had (correctly) recognized that capital restrictions cannot truly protect an economy from financial weaknesses, Goldman would have clearly anticipated the Korean debacle, as it anticipated the Thai meltdown.

During 1997-98, controls on the free mobility of capital also gave a false sense of security to Brazilian policy makers. They repeatedly argued that since short-term capital inflows were restricted, their currency could not suffer the same fate as the Mexican peso. As it turned out, they were wrong. As in Mexico, once the collapse of the real became imminent, domestic and foreigner investors rushed to the door and flee the country. More recently, the 2003 experience of Venezuela shows clearly that the imposition of exchange and capital controls is not an effective way of dealing with major macroeconomic disequilibria. At best they help postpone (somewhat) the day of reckoning, and at worst they provide a distraction and end up magnifying the magnitude of the eventual crisis.

Nobel Laureate Joe Stiglitz has been particularly critical of the opening of the capital account – both to outflows and inflows. In his 2001 book he claims that the experiences of China and India, two countries that did not suffer a crisis, and of Malaysia –which did not follow the IMF's advice, and recovered quickly– support his views on the costs of opening up the capital account. His argument is not overly persuasive, however, since there are many reasons why India and China have not faced a crisis, and attributing this to the presence of capital controls is overly simplistic, if not plainly wrong.

The case of Malaysia is particularly interesting, and adds a different angle to the discussion. It recovered fast after the 1997 crisis – although not as fast as South Korea –- , but it is not clear whether recovery was the result of the imposition of capital controls and of fixing of the exchange rate. In a recent paper Kaplan and Rodrik (2003) provide a detailed discussion of Malaysia's unorthodox reaction to the currency upheaval of 1997-98. The authors' note that the imposition of capital controls by Malaysia, in September 1998, was greeted with great skepticism by most analysts and observers. In particular, IMF officials and investment banks' analysts argued that these controls – and the accompanying decisions to peg the exchange rate and lower domestic interest rates – would result in a slower recovery, and in a significant reduction in foreign direct

investment into Malaysia. This latter (potential) effect of the controls was considered to be particularly devastating, as Malaysia has traditional rely heavily on FDI. Kaplan and Rodrik argue that this general perception is incorrect, and that once the appropriate econometric techniques are used there is evidence suggesting that Malaysia's unorthodox program yielded very positive results. The late Rudi Dornbusch (2003) took issue with this view, and argues that the good performance of the Malaysian economy in the post crisis period had little to do with the controls. In his opinion, a very friendly international environment – driven mostly by successive cuts in interest rates by the Federal Reserve – was the main force behind Malaysia's recovery of 1999-2000.

As the preceding discussion suggests, a full understanding of the Malaysian episode will require additional research. What is true, however, is that Malaysia surprised many observers by tightening controls only temporarily; after approximately a year, and once the economy had stabilized, the controls were lifted just as Dr. Mahatir had originally announced. What makes Malaysia's case particularly interesting is that historically the temporary use of controls is quite unique. As pointed out above, the historical norm is closer to what happened in Latin America during the 1980s debt crisis, when what was supposed to be a temporary tightening of controls, became a long term feature of the regional economies.

III.3   *Capital Account Liberalization and the Sequencing of Reform*

From a policy point of view a particularly important question refers to the speed and sequencing of liberalization. In particular, the key questions are how fast and at what point in the liberalization process should capital controls be eliminated, and the capital account liberalized. Many critics of the reform process of the 1990s have argued that in the 1990s many emerging countries liberalized their current account too fast and in the wrong sequence (Stiglitz 2002).

The emphasis on speed and sequencing is not new in policy discussions. In fact, since the beginning of the economics profession, it has been dealt with over and over again. Adam Smith, for example, argued in **The Wealth of Nations** that determining the appropriate sequencing was a difficult issue that involved, primarily, political considerations (see the Cannan Edition, Book IV, Chapter VII, Part III, page 121). Moreover, Smith supported gradualism on the grounds that cold-turkey liberalization

would result in a significant increase in unemployment. Consider the following quote from ***The Wealth of Nations***:

> "[t]o open the colony trade all at once..., might not only occasion some transitory inconvenience, but a great permanent loss...[T]he sudden loss of employment..., might alone be felt very sensibly" (Vol. II, Ch. VII, pt. III, page 120).

This issue of speed and sequencing also became central in analyses on how to design a reform strategy for the former communist countries. In discussing the problems faced by Czechoslovakia during the early period of its transition, Vaclav Klaus pointed out that one of the main problems was deciding on "sequencing as regards domestic institutional and price measures on the one hand, and liberalization of foreign trade and rate of exchange on the other" (Klaus, 1990, page 18).

In the early 1980s the World Bank became particularly interested in exploring issues related to sequencing and speed of reform. Papers were commissioned, conferences were organized, and different country experiences were explored. As a result of this work, a consensus of sorts developed on the sequencing and speed of reform. The most important elements of this consensus included: (1) trade liberalization should be gradual and buttressed with substantial foreign aid. (2) An effort should be made to minimize the unemployment consequences of reform. (3) In countries with very high inflation, fiscal imbalances should be dealt with very early on in the reform process. (4) Financial reform requires the creation of modern supervisory and regulatory agencies. And (5), the capital account should be liberalized at the very end of the process, and only once the economy has been able to expand successfully its export sector. Of course, not everyone agreed with all of these recommendations, but most people did. In particular, people at the IMF did not object to these general principles.   For example, Jacob Frenkel, who was to become the IMF's Economic Councellor argued in a mid 1980s article in the *IMF Staff Papers* that the capital account should, indeed, be opened towards the end of the reform process. I think that it is fair to say that during the late 1980s, the idea of gradualism and a "capital account last" sequencing had become part of the received wisdom.

This general view on sequencing has been endorsed by Nobel Laureate Robert

Mundell, who in 1995 argued:

> "[U]nfortunately…there are some negative externalities [of an early capital
> account liberalization]. One is that the borrowing goes into consumption rather
> than into investment, permitting the capital-importing country to live beyond its
> means…without any offset in future output with which to service the loans. Even
> if the liabilities are entirely in private hands, the government may feel compelled
> to transform the unrepayable debt into sovereign debt rather than allow execution
> of mortgages or other collateral. (p. 20)."

What is particularly important about this quote is that Mundell acknowledges that

the probability a government bail out of private borrowers constitutes a serious

externality. Other analysts, such as Stiglitz (2002), for example, have failed to recognize

this important point. Indeed, when criticizing the IMF's views on trade imbalances

Stiglitz argues – incorrectly, in my view – that the government should not worry if the

private sector runs large deficits. More specifically he says:

> "This [large private sector indebtedness to finance questionable investments] may
> be a problem for the creditor, but it is not a problem that the country's government
> – or the IMF – needs to worry. (p. 200)."

Sometime in the 1990s the "received wisdom" on the sequencing of capital

account liberalization began to change, and economists both at the IMF and the U.S.

Treasury began to argue that an early opening of the capital account was desirable. This

view was clearly stated by the late Manuel Guitian, then a senior official at the IMF, who

in a 1995 paper argued in favor of moving quickly towards capital account convertibility.

I believe that Guitian's paper – suggestively titled *"Capital Account Liberalization:*

Bringing Policy in Line with Reality" – is one of the first written pieces that documents

the IMF's change in views regarding sequencing and capital account convertibility. After

discussing the evolution of international financial markets, and expressing reservations

about the "capital-account-last" sequencing recommendation, Guitian summarized his views as follows:

> "There does not seem to be an a priori reason why the two accounts [current and capital] could not be opened up simultaneously…[A] strong case can be made in support of rapid and decisive liberalization in capital transactions (p. 85-86)."

During the second half of the 1990s, and partially as a result of this change in views on sequencing and capital account convertibility, a number of emerging and transition countries began to relax their controls on capital mobility. In doing this, however, they tended to follow different strategies and paths. While some countries only relaxed bank lending, other only allowed long-term capital movements, and yet others – such as Chile -- used market-based mechanisms to slow down the rate at which capital was flowing into the economy. Many countries, however, did not need any prodding by the IMF or the U.S. to open their capital account. Indonesia and Mexico – just to mention two important cases – had a long tradition of free capital mobility, which preceded the events discussed in the 1990s, and never had any intention of following a different policy.

In the aftermath of the succession of crises during the 1990s a number of authors – including economists at the multilateral institutions -- began to investigate the sequencing issue once again. In particular, the idea that an "early" liberalization may not be beneficial after all began once again to gain some currency – see Eichengreen (2003), for example. But agreeing that sequencing is important, is not the same as saying that capital controls should never be lifted. A difficult and important policy issue – and one that the critics of globalization do not really tackle –, is how and when to remove impediments to capital mobility. A first step in answering this question is determining the long-term consequences of capital mobility on economic performance. As Stiglitz acknowledges, this is a difficult question, and one about which we have limited evidence. However, recent research that uses new and improved measures on the degree of openness of capital mobility suggest that a freer capital account has a positive effect on long run growth in countries that have surpassed a certain stage in the development process, and have strong institutions and domestic capital markets – see Edwards (1999)

and IMF (2003). The challenge for the transition and emerging countries is to implement rapidly the type of requirements – in terms of bank and capital market supervision – that would allow them to liberalize their capital accounts successfully.

IV.   Capital Account Restrictions and Vulnerability to Crises: Some New Results

As pointed out earlier, one of the main objectives of policies aimed at restricting capital mobility is reducing country's vulnerability to external crises (Rodrik 1998). Moreover, according to this view, countries that limit the extent of capital mobility will suffer less from external crises, once these have occurred (Stiglitz 2002).   Although, in many ways these arguments seem plausible, there has been limited effort to investigate empirically whether this has indeed been the case. In this section I report some new empirical work that addresses these issues.[18] The analysis focuses on the occurrence of *current account reversals,* a crisis-related phenomenon that according to my previous research tends to be very costly in terms of reduced growth. Specifically, I ask the following two questions directly related to the degree of openness of the capital account:

* To what extent does financial openness affect the probability of a country being subject to a current account reversal? In other words, do restrictions on capital mobility reduce the probability of such occurrences?
* Does financial openness play a role in determining the effect of current account reversals on economic performance (i.e. GDP growth)?

I also address the following related questions:

* Does the existence of restrictions on capital mobility reduce the costs of external crises (i.e. current account reversals)?
* And, does the exchange rate regime affect the intensity with which reversals affect real activity?

I define a current account reversal as a reduction in the current account deficit of at least 4% of GDP in one year. An interesting question is how current account reversals

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[18] This discussion is partially based on Edwards (2004b).

relate to "sudden stop" of capital inflows? In order to make a formal comparison, I define a sudden stop as a situation when there is an abrupt and major reduction in capital inflows to a country that has been receiving large volumes of foreign capital. In particular, a sudden stop occurs when net capital inflows have declined by at least 5% of GDP in one year (see Edwards 2004a for details).

Using a panel data set for 157 countries I found that during 1970-2001 there was a 5.6% incidence of sudden stops; the incidence of reversals was 11.8%. Not surprisingly, these two phenomena have been closely related. However, the relationship is less than perfect. Historically there have been many sudden stops that have not been related to reversal episodes. This indicates that when facing a sudden stop, many countries have effectively used their international reserves to avoid an *abrupt* current account adjustment. At the same time, a number of countries have gone through major current account reversals without facing a sudden stop in inflows. Most countries in this group were not receiving large inflows to begin with, and had financed their large deficits by drawing down international reserves (see Edwards, 2004).

As may be seen in Table 3, for the complete sample (2,228 observations), 46.1% of countries subject to a sudden stop faced a current account reversal. At the same time, 22.9% of those with reversals also experienced (in the same year) a sudden stop. The joint incidence of reversals and sudden stops has been highest in Africa, where approximately 62% of sudden stops happened at the same time as current account reversals, and almost 30% of reversals coincided with sudden stops. For every one of the regions, as well as for the complete sample, Pearson χ^2 tests for the independence of distributions have very small p-values, indicating that although there are observed differences between these two phenomena, the two are statistically related. For the complete sample the χ^2 statistic for the null hypothesis of independence of distributions has a value of 159.8. These results do not change in any significant way if different definitions of reversals and sudden stops are used, or if different configurations of lags and leads are considered.

In a number of models the costs of foreign shocks – including sudden stops and current account reversals -- are inversely proportional to the country's degree of openness. In Mundell-Fleming type of models the *expenditure reducing* effort, for any

given level of expenditure switching, is inversely proportional to the marginal propensity to import. In these models adjustment costs are also inversely proportional to the degree of financial integration. Countries with a higher degree of financial openness will require a smaller reduction in aggregate income to accommodate external shocks than countries with a lower degree of financial integration (Jacob Frenkel and Assaf Razin 1987). Recently, Guillermo Calvo, Alejandro Izquierdo and Luis Mejia (2003) developed a model where sudden stops result in abrupt current account reversals, and in major real exchange rate depreciations. Depreciations, in turn, are contractionary, with the extent of the contraction depending inversely on the degree of trade openness of the economy. They argue that sudden stops and current account reversals will have a greater impact in closed economies – such as Argentina – than in more open ones, such as Chile.

Previous empirical works on the effects of current account reversals on real economic performance have reached different conclusions. Gian Maria Milesi-Ferreti and Razin (2000), for example, concluded that "reversal… are not systematically associated with a growth slowdown (p. 303)." Edwards (2002), on the other hand, used dynamic panel regressions and concluded that major current account reversals had a negative effect on investment, and on GDP per capita growth, even after controlling for investment. Neither of these papers, however, analyzed the interaction between openness or the exchange rate regime, and the costs of current account reversals.

IV.1 An Empirical Model

I use a "treatment effects" model to estimate jointly an equation on real GDP growth and a probit equation on the probability of a current account reversal.

$$(2) \qquad g^*_j = \phi + \mathbf{x}_j \beta + \omega_j.$$

$$(3) \qquad \Delta g_{tj} = \lambda [g^*_j - g_{t\text{-}1\,j}] + \varphi v_{tj} + \gamma \delta_{tj} + \theta (\delta_{tj} \text{Openness}_{tj}) + \xi_{tj}.$$

$$
(4) \qquad \delta_{tj} \;=\; \begin{cases} 1, & \text{if } \delta^{*}_{tj} > 0 \\[2em] 0, & \text{otherwise} \end{cases}
$$

$$
(5) \qquad \delta^{*}_{tj} \;=\; \mathbf{w}_{tj}\,\alpha + \varepsilon_{tj}.
$$

Equation (2) is a long run growth equation. g^{*}_{j} is long run real per capita GDP growth in country j; $\mathbf{x}_{j}$ is a vector of covariates that capture the role of traditional determinants of growth, and ω_{j} is an error term. Equation (3) is a growth dynamics equation, where $[\,g^{*}_{j} - g_{t\text{-}1\,j}\,]$ is a partial adjustment term (the "growth gap"), v_{tj} is a terms of trade shock, and δ_{tj} is a dummy variable (i.e. the treatment variable) that takes a value of one if country j in period t experienced a current account reversal, and zero if the country did not experience a reversal. Thus, γ is the parameter of interest: the effect of the treatment on the outcome. Finally, $(\delta_{tj}\,\text{Openness}_{tj})$ is a variable that interacts δ_{tj} with a measure of openness. Whether the country experiences a current account reversal is assumed to be the result of an unobserved latent variable δ^{*}_{jt}, in equation (4). δ^{*}_{jt}, in turn, is assumed to depend on vector $\mathbf{w}_{jt}$. Some of the variables in $\mathbf{w}_{jt}$ may be included in $\mathbf{x}_{jt}$. Exclusionary restrictions are imposed for identification purposes. β and α are parameter vectors. ξ_{jt} and ε_{jt} are error terms assumed to be bivariate normal, with a zero mean and a covariance matrix:

$$
(6) \qquad \begin{pmatrix} \sigma & \varsigma \\ \varsigma & 1 \end{pmatrix}
$$

A two-step estimation procedure is used. Equation (2) is estimated using data for long-term averages and Feasible Least Squares. Fitted values of long term growth are used as g^{*}_{j} in equation (3). Equations (3) and (5) are then estimated jointly. In the estimation of equation (3), I included terms that interact the dummy variable δ_{tk} with

two openness variables – one for trade and one for financial openness. Trade openness is defined as the ratio of imports plus exports to GDP. Financial openness is measured using the new index discussed above, that combines the Quinn (2003) index and the Mody and Murshid (2002) index on capital mobility. This new index goes from 1 to 100, with higher values denoting a higher degree of financial integration. Thus, countries with stricter capital controls have a lower value of this index. Since I am interested in understanding the role of financial openness in the probability of reversals, one of the w^j_t in equation (4) is the index of financial integration described above.

In the long run growth equation (2) the dependent variable is real GDP growth per capita. The following covariates were included: the log of initial GDP per capita; the investment ratio; the coverage of secondary education; an index of the degree of openness of the economy; the ratio of government consumption to GDP; and regional dummies. In some specifications I also included an indexes for the exchange rate regime. Results from the estimation of (2) are not reported due to space constraints.

In the growth equation (3) v_{tj} is the change in the terms of trade, and δ_{tj} is the current account reversals dummy.   As stated, I also included the current account reversal dummy interacted with the trade openness variable, and interacted with the financial openness index. If reversals have a negative impact on (short-term) growth, the coefficient of the reversals' dummy will be significantly negative. If this effect is inversely proportional to the country's degree of openness, the coefficients of the interaction between reversals and openness should be significantly positive.

In specifying equation (5) I followed the empirical literature on crises, and I included the following covariates (all lagged one period): (a) The ratio of the current account deficit to GDP. (b) The external debt to GDP. (c) Net international reserves to GDP. (d) The share of short term external debt. (e) The relative occurrence of sudden stops in the country's region. (f) Growth of domestic credit.   (h) The log of initial per capita GDP. (g) An index of financial integration. And (i) country-specific dummies.

IV.2 Basic Results

In Table 4 I summarize the basic results obtained from the estimation of a number of treatment models for GDP growth dynamics (the coefficients of the country specific dummies are not reported). The table contains two panels. The upper panel (A) includes

the results from the growth equation; the lower panel (B) contains the estimates for the "treatment equation," or probit equation on the probability of experiencing a current account reversal. As pointed out above, the *treatment observations* correspond to current account reversal episodes. Table 1 also includes the estimated coefficient of the hazard lambda, as well as the estimated elements of the variance-covariance matrix (5). The first three equations are for emerging markets. The last equation (1.4) is for the complete sample of emerging and industrial countries. I discuss first the results from the probit equations on the probability of reversals. I then focus on the results from the dynamics of growth equations.

The probit estimates are presented in the lower panel of Table 1. The results are similar across models: most coefficients have the expected signs, and are statistically significant at conventional levels. These results indicate that the probability of experiencing a reversal is higher for countries with a large (lagged) current account deficit, a high external debt ratio, a rapid rate of growth of domestic credit, lower initial GDP, and a high occurrence of sudden stops in their region. Countries that have a higher level of net international reserves have a lower probability of experiencing a reversal. The coefficients of the short-term debt have the expected sign, but tend not to be significant. Particularly important for the subject of this paper, the coefficient of the financial openness index is *negative* in all regressions, and it is and significantly *negative* in equation (1.4) for the complete sample. This provides some (weak) evidence suggesting that countries with a higher degree of financial openness have a *lower* probability of facing a current account reversal. That is, contrary to what has been argued by critics of globalization and by supporters of restricting capital mobility, these results suggest that the presence of capital account restrictions does not reduce the probability of an external crisis. These results are robust to the sample used, as well as to the specification of the probit equation. A possible explanation is that the public finds way to circumvent the restrictions. In addition, it is possible that in countries with capital controls the authorities become overconfident, and tend to implement more "risky" macroeconomic policies.

The results from the estimation of the growth dynamics equation are reported in Panel A. The growth gap and the terms of trade coefficients have the expected signs and

are significant. More importantly, the coefficients of the current account reversal dummy are always significantly negative, and the coefficients of the term that interacts trade openness and reversals is always significantly positive.

In equations (1.2) and (1.3) the estimated coefficient of the variable that interacts reversals and financial openness is negative but not significant. All in all, these results suggest that of financial openness has no effect on the way in which reversals affect growth. That is, in contrast with the claims of supporters of capital controls, there is no evidence supporting the view that countries that restrict capital mobility face a lower cost of crises – or, more specifically, of current account reversals – than countries that allow for greater capital mobility.

A particularly interesting result in Table 4 refers to the interaction between the current account reversals dummy and the trade openness variable. As may be seen, in all specifications the coefficient of this interactive variable is positive and significant at conventional levels. This means that the effects of a current account reversal on (short term) growth depend significantly on the degree of *trade openness* of the economy. This result can be illustrated for the case of equation (1.1): [19]

Growth Effects of Reversals = -6.025 + 0.032 *trade openness*.

The variable *trade openness* varies significantly across countries. Its mean is 65%, its standard deviation is 35%, and its median is 67.4%. The first decile is 28.7%, and the ninth decile is 130.7%. For a country with a degree of openness equal to the mean, the point estimate of the effect of a reversal on GDP growth (relative to trend) is: -3.945% (-6.025 + 0.032 x 65 = -3.945). If the country's degree of openness is low and equal to the first decile, the effect of a reversal on growth is more negative and equal to -5.11%. But if the country is very open to trade, and its degree of openness corresponds to the ninth decile, the effect of a reversal on growth is much smaller, at –1.84%.

An important question is whether the effects of current account reversals on growth dynamics depend on the exchange rate regime. To address this issue I divided the

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[19] I am ignoring the other coefficients from this equation. See table 4 for details.

sample according to four alternative de-facto regimes: hard peg; pegged, intermediate and flexible (see Levy-Yeayati and Sturzenegger, 2003 for the classification). I then compared the estimates of both the reversals treatment dummy, as well as the term that interacts reversals and trade openness. The results may be summarized as follows: the estimated coefficient of reversals (z-statistic) for pegged regimes was -6.573 (-4.43). For flexible rates it was positive and not significant: 0.373 (1.09). The interactive term was 0.041 (3.43) for pegged and –0.044 (-1.01) for flexible regimes. A χ^2 test indicates that these differences in coefficients across regimes are significant. All in all, these results support the idea that flexible exchange rates act as shock absorbers, allowing countries to accommodate better external shocks, including current account reversals.

To sum up, econometric analysis reported in this section suggests that restricting capital mobility does not reduce the probability of experiencing a current account reversal. Current account reversals, in turn, have had a negative effect on real growth that goes beyond their direct effect on investment. The regression analysis indicates that the negative effects of current account reversals on growth will depend on the country's degree of trade openness: More open countries will suffer less – in terms of lower growth relative to trend– than countries with a lower degree of trade openness. On the other hand, the degree of financial openness does not appear to be related to the intensity with which reversals affect real economic performance. The empirical analysis also suggests that countries with more flexible exchange rate regimes are able to accommodate better shocks stemming from a reversal than countries with more rigid exchange rate regimes. In interpreting the findings reported in this paper, it is important to keep in mind that measuring financial integration is far from easy (Quinn 2003). Further work on the subject should aim at producing even better indexes of financial integration and capital account restrictions.

V.   Concluding Remarks

In this paper I have reviewed both the policy arguments used to justify restricting capital mobility, and I have analyzed the extent to which these policy objectives have been achieved. I evaluated the effectiveness of controls on inflows and controls on outflows, and I discussed arguments related to the appropriate sequencing of economic liberalization. A central aspect of the paper has been the estimation of an empirical

model of current account reversals and economic performance. Overall, the analysis presented in this paper suggests that policies aiming at capital controls have been less effective – in terms of helping achieve their objectives – than what their supporters have claimed.   In Section III I have argued that the merits of Chilean-style controls on capital inflows have been somewhat exaggerated. The evidence reviewed in Section III of this paper suggests that the effectiveness of this tool was limited. So much so, that Chile itself abolished the controls more than five years ago and the authorities have no intentions to re-impose them in the future. I also argued that historically the experience with on controls on outflows gas tended to be negative – they don't help to re-establish growth, encourage black markets and corruption, and create a false sense of security. Malaysia in the 1990s is, perhaps, an exception to this proposition. As I point out in Section III, the views on the evidence are contradictory and getting a definitive evaluation of effectiveness of these controls will have to await further details. What is clear, however, is that Malaysia presents a unique set of historical and political circumstances.   It is highly unlikely that its experience – and in particular the lifting of controls after one year – would be replicated in other countries.   The argument that capital controls should be abolished once other reforms have been undertaken has merits. In particular, there is historical and statistical evidence that suggests that implementing a modern bank supervisory system before lifting capital controls makes eminent sense. But, as I point out in Section III, the fact that there is an adequate and preferred sequencing does not mean that controls on capital mobility should never be lifted.

Finally, it should be stressed once again that, as documented by Forbes (2004), Desai, Foley and Hines (2004), and Gallego and Hernadez (2003), among others, restricting capital mobility also has important costs. Once these are introduced into the analysis, the attractiveness of policies that control capital mobility will decline further. At the end of the road, however, the final result on the net benefits (or costs) of this type of policies will be country specific; while in some countries they may play a positive transitional role, in others they are likely to have net costs.

REFERENCES

Budnevich, Carlos and Guillermo Lefort. 1997. "Capital Account Regulation and Macroeconomics Policy: Two Latin American Experiences". Documento de Trabajo No. 6. Banco Central de Chile.

Calvo, Guillermo A., 2003. "Explaining Sudden Stops, Growth Collapse, and BOP Crises: The Case of Distortionary Output Taxes," *NBER Working Paper* 9864 (Cambridge, Massachusetts: National Bureau of Economic Research).

Calvo, Guillermo and Miguel Mendoza. 1999. "Empirical Puzzles of Chilean Stabilization Policy." in G. Perry and D. M. Leipziger (Eds.): *Chile: Recent Policy Lessons and Emerging Challenges*, The World Bank, Washington DC.

Cowan, Kevin and Jose de Gregorio. 1998. "Exchange Rate Policies and Capital Account Management." In R. Glick *ed. Managing Capital Flows and Exchange Rate Rates,* Cambridge: Cambridge University Press, 465–488.

Chinn, Menzie and Hiro Ito 2002. "Capital Account Liberalization, Institutional and Financial Development," NBER Working paper No. 8967

De Gregorio, Jose, Sebastian Edwards, and Rodrigo Valdes. 1998. Capital Controls in Chile: An Assessment." paper presented at the 11th IASE-NBER conference.

De Gregorio, Jose, Sebastian Edwards, and Rodrigo Valdes. 2000. "Controls on Capital Inflows: Do they Work?" *Journal of Development Economics*, Vol. 63, pp. 59-83.

Dornbusch, Rudi. 2003. "Malaysia: Was it Different?." In S. Edwards and J. Frankel (Eds.): *Preventing Currency Crises in Emerging Markets*. The University of Chicago Press.

Edison, Hali, Michael W. Klein, Luca Ricci and Torsten Sloek (2002) "Capital Account Liberalization and Economic Performance: Survey and Synthesis," NBER Working paper No. 9100

Edwards, Sebastian. 1998a. "Capital Inflows into Latin America: A Stop-Go Story?" National Bureau of Economic Research Working Paper. No. 6441.

Edwards, Sebastian. 1998b. "Capital Flows, Real Exchange Rates, and Capital Controls: Some Latin American Experiences." National Bureau of Economic Research Working Paper. No. 6800.

Edwards, Sebastian. 1999. "How Effective are Capital Controls". *Journal of Economic Perspectives*. 13 (4): 65-84.

Edwards, Sebastian 2000a. "Capital Flows, Real Exchange Rates and capital
Controls: Some Latin American Experiences," in S. Edwards (ed) *Capital
Flows and the Emerging Economies*, University of Chicago Press.

Edwards, Sebastian. 2000b. "Interest Rates, Contagion and Capital Controls".
National Bureau of Economic Research Working Paper. No. 7801.

Edwards, Sebastian. 2003. "Review of Joseph E. Stiglitz's Globalization and its
Discontents." *Journal of Development Economics*. 70 (1): 252-257

Edwards, Sebastian. 2004. "Thirty Years of Current Account Imbalances, Current
Account Reversals and Sudden Stops" (Fourth Mundell-Fleming Lecture)
International Monetary Fund Staff Papers

Edwards, Sebastian. 2004. "Financial Openness, Sudden Stops, and Current
Account Reversals and" *American Economic Review*, May, p. 59-64.

Edwards, Sebastian and Alejandra Cox-Edwards. 1991. *Monetarism and
Liberalization: The Chilean Experiment, Second Edition with a New Afterword*.
Chicago: University of Chicago Press

Edwards, Sebastian and Julio Santaella, 1993. Devaluation Controversies in the
Developing Countries. In Michael Bordo and Barry Eichengreen (Eds) *A
Retrospective on the Bretton Woods System*. University of Chicago Press.

Edwards, Sebastian, and Raul Susmel, 2003. "Interest Rate Volatility in Emerging
Markets," *Review of Economics and Statistics*, Vol. 85 (May), pp. 328–348.

Eichengreen, Barry J. 1999. *Toward a New International Financial Architecture*,
Institute for International Economics. Washington D.C.

Eichengreen, Barry J. 2001, "Capital Account liberalization: What do Cross Country
Studies Tell us?" The World Bank Economic Review, 15, pp. 341-365

Eichengreen, Barry J. 2003. *Capital Flows and Crises*. Cambridge, MA: MIT Press

Harberger, Arnold. 1985. Observations on the Chilean Economy, 1973-1983. *Economic
Development and Cultural Change*. 33, (3): 451-462.

IMF. 2003. World Economic Outlook: Public Debt in Emerging Markets.
International Monetary Fund. Washington D.C.

Ito, Taka and Richard Portes. 1998. "Dealing with the Asian Financial Crises".
European Economic Perspectives. CERP.

Rodrik, Dani and Ethan Kaplan. 2003. "Did the Malaysian Capital Controls Work?" in S. Edwards and J. Frankel (Eds.): *Preventing Currency Crises in Emerging Markets*. The University of Chicago Press.

Krugman, Paul. 1999. "Currency Crises," in M. Feldstein (Ed.). *International Capital Flows*. NBER and Chicago University Press, Ch. 8, 421-440.

Massad, Carlos. 1998a. "The Liberalization of the Capital Account: Chile in the 1990s". *Essays in International Finance*. 207. Department of Economics, Princeton University. May.

Massad, Carlos. 1998b. "La Política Monetaria en Chile". *Revista de Economía Chilena*. 1 (1). Banco Central de Chile.

Soto, Claudio. 1997. "Controles a los Movimientos de Capitales: Evaluación Empírica del Caso Chileno". Mimeo. Banco Central de Chile.

Stiglitz, Joseph. 2002. *Globalization and its Discontents*. W.W. Norton, New York and London.

Valdés-Prieto, Salvador and Marcelo Soto. 1996a. "Es el Control Selectivo de Capitales Efectivo en Chile? Su Efecto sobre el Tipo de Cambio Real." *Cuadernos de Economía*. 33(98): 77-108.

Valdes-Prieto, Salvador and Marcelo Soto. 1996b. "New Selective Capital Controls in Chile: Are They Effective?." Mimeo, Catholic University of Chile.

Valdés-Prieto, Salvador and Marcelo Soto. 1998. "The Effectiveness of Capital Controls: Theory and Evidence from Chile." Empirica 25(2): 133-164.

Table 1: The Evolution of Capital Account Openness, 1970-2000*

	1970-1989			1990-2000		
	Mean	**Median**	**St. Dev.**	**Mean**	**Median**	**St. Dev.**
Industrial	66.5	75	21.7	88.8	100	15.2
LAC	49.2	50	22.5	65.4	75	22.0
Asia	41.3	37.5	25.8	53.2	50	24.0
Africa	41.3	37.5	18.4	49.1	50	19.0
MENA	62.3	75	25.0	66.3	75	23.4
East Europe	--	--	--	60.0	50	17.2

*The capital account openness index goes from zero to one hundred, with higher values meaning a greater degree of openness.
Source: Constructed by the author using the methodology explained in the text..

Table 2:
The Objectives of Capital Account Management Policies: A Summary

Policy Objective	Mechanisms at Work	Type of Restrictions	Comments
1. Reduce Vulnerability to External Crises	-Tilt capital flows towards longer maturities. - Avoid "over borrowing" by domestic firms; reduce exposure to "*balance sheet*" effects.	- Controls on *inflows* are favored; in particular restrictions on short term 'speculative' flows	- Chile type controls are considered to be the "best practice." - Colombia's experience also relevant. - Whether to restrict fixed income or equity flows seems important (Korea). - Banks supervision is an important policy that could deal with most of the vulnerabilities generated by the inflows.
2. Avoid "excessive" Real Exchange Rate Appreciation	- By controlling inflows, hikes in aggregate expenditure are reduced - By financing expenditure on non tradables (including real estate and construction) appreciation may be significant. - It is important to determine whether following reforms capital inflows overshoot.	- Controls on *inflows* are favored. - A key problem of the inflows is that sterilization can be very costly. - The key is to reduce the percentage of the flows spent on nontradables.	- The real appreciation problem seems to affect different countries differently; while in the 1990s it was severe in Latin America, it was much less so in South East Asia.

Table 2: (Continuation)

Policy Objective	Mechanisms at Work	Type of Restrictions	Comments
3. Independent Monetary Policy	- With free capital mobility domestic and interest rates are closely linked, making it hard to pursue an independent monetary policy. - This is particularly the case in countries with predetermined nominal exchange rates. In this case monetary policy is endogenous.	- Either controls on *inflows* or controls on *outflows* could, in principle, unhinge domestic and international interest rates.	- Independent monetary policy could be achieved under flexible exchange rates. - Countries that have combined flexible rates with inflation targeting have done well. - "Fear of floating" is an issue.
4. Reduce Costs of Crises and Make Crisis Resolution Policies More Effective	- The traditional (IMF-associated) post crisis policies include a severe hiking of domestic interest rates. - This generates recessionary forces, and greater bankruptcies. - Lowering interest rates could provide some alleviation. To avoid capital flight, this requires controls on outflows.	- Calls for (temporary) controls on *outflows*. - Temporary controls on outflows are also advocated as a way of facing speculative attacks, or situations were countries are moving towards a crisis.	- A key of these policies is the "temporary" aspect of the (tighter) controls. - These policies may be – and in history have been – combined with controls on inflows.

Source: The author. See the text.

Table 3
Current Account Reversals and Sudden Stops*

All countries

	No sudden stop	Sudden stop	Total
No reversal	1892	69	1961
	96.5	3.5	100
	90.2	53.1	88.0
Reversal	206	61	267
	77.1	22.9	100
	9.8	46.9	12.0
Total	2098	130	2228
	94.2	5.8	100
	100	100	100
Pearson χ^2 (1) = 159.78 p-value = 0.000			

Industrial countries

	No sudden stop	Sudden stop	Total
No reversal	539	18	557
	96.8	3.2	100
	98.2	81.8	97.55
Reversal	10	4	14
	71.4	28.6	100
	1.8	18.2	2.5
Total	549	22	571
	96.2	3.8	100
	100	100	100
Pearson χ^2 (1) = 21.14 p-value = 0.000			

Latin America and Caribbean

	No sudden stop	Sudden stop	Total
No reversal	578	23	601
	96.17	3.83	100
	87.2	44.2	84.1
Reversal	85	29	114
	74.6	25.44	100
	12.8	55.8	15.9
Total	663	52	715
	92.7	7.3	100
	100	100	100
Pearson χ^2 (1) = 18.35 p-value = 0.000			

Table 3 (Continuation)

Asia

	No sudden stop	Sudden stop	Total
No reversal	294	12	306
	96.1	3.9	100
	87.5	48.0	84.8
Reversal	42	13	55
	76.4	23.6	100
	12.5	52.0	15.2
Total	336	25	361
	93.1	6.9	100
	100	100	100
Pearson χ^2 (1) = 9.55 p-value = 0.002			

Africa

	No sudden stop	Sudden stop	Total
No reversal	579	21	600
	96.5	3.5	100
	85.8	37.5	82.1
Reversal	96	35	131
	73.3	26.7	100
	14.2	62.5	17.9
Total	675	56	731
	92.3	7.7	100
	100	100	100
Pearson χ^2 (1) = 60.63 p-value= 0.000			

Middle East

	No sudden stop	Sudden stop	Total
No reversal	193	12	205
	94.2	5.8	100
	87.7	50.0	84.0
Reversal	27	12	39
	69.2	30.8	100
	12.3	50.0	16.0
Total	220	24	244
	90.2	9.8	100
	100	100	100
Pearson χ^2 (1) = 22.38 p-value= 0.000			

Table 4
Current Account Reversals, Openness and Growth
Treatment Effects Model – Two Steps Estimates

Variable	(1.1)	(1.2)	(1.3)	(1.4)
		Panel A		
Growth gap	0.843**	0.843**	0.840**	0.834**
	(33.1)	(33.1)	(32.8)	(33.1)
Change in terms of trade	0.062**	0.061**	0.061**	0.066**
	(8.51)	(8.46)	(8.45)	(8.51)
Reversal	-6.025	-5.087	-2.710**	-5.722
	(5.66)	(3.86)	(2.32)	(6.64)
Reversal*Trade Openness	0.032**	0.034**		0.023**
	(3.66)	(3.78)		(3.08)
Reversal*Financial Openness		-0.024	-0.014	
		(1.21)	(0.74)	
		Panel B		
Current account deficit to GDP (-1)	0.114**	0.114**	0.114**	0.122**
	(9.82)	(9.82)	(9.82)	(10.78)
External debt to GDP (-1)	0.004**	0.004**	0.004**	
	(2.30)	(2.30)	(2.30)	
Net international reserves to GDP (-1)	-0.148*	-0.148*	-0.148*	-0.188*
	(1.78)	(1.76)	(1.76)	(2.38)
Short term ext. debt to external debt (-1)	0.001	0.001	0.001	
	(0.42)	(0.42)	(0.42)	
Incidence of reversals in region	1.522**	1.524	1.524	1.556**
	(2.50)	(2.50)	(2.50)	(2.70)
Domestic credit growth (-1)	0.002	0.002	0.002	0.002*
	(1.32)	(1.32)	(1.32)	(1.78)
Log initial GDP per capita	-1.743**	-1.743**	-1.743**	-0.845**
	(7.51)	(7.51)	(7.51)	(3.71)
Financial Openness (-1)	-0.007	-0.007	-0.007	-0.009**
	(1.54)	(1.55)	(1.55)	(2.09)
Hazard lambda	1.192**	1.232**	1.082**	1.314**
	(2.49)	(2.57)	(2.25)	(3.23)
rho	0.284	0.347	0.257	0.346
sigma	4.611	4.606	4.208	3.804
Wald chi2	1,634.1	1,174.2	1,221.9	1,916.9
Observations	1,176	1,174	1,174	1,561

Absolute value of z statistics in parentheses; (-1) denotes a one-period lagged variable; Country-specific and year dummies are included as discussed in text, but are not reported.
*Significant at 10%;** significant at 5%.