

MANAGING THE CAPITAL ACCOUNT

Sebastián Edwards

University of California at Los Angeles

Globalization has been under attack over the last few years. 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 antiliberalization mood was the failure of the World Trade Organization (WTO) Cancún meeting in September 2003. The antiglobalization 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 International Monetary Fund (IMF), Stiglitz (2002) argues that pressuring emerging and transition countries to relax controls on capital mobility in the 1990s was highly irresponsible. Stiglitz goes so far as to argue that the easing of controls on capital mobility was at the center of most (if not all) of the recent currency crises in emerging markets—Mexico 1994, East Asia 1997, Russia 1998, Brazil 1999, Turkey 2000, and Argentina 2001. These days, even the IMF seems to criticize free capital mobility and to support capital controls (at least to some degree). Indeed, in a visit to Malaysia in September 2003 Horst Koehler, then the Fund's Managing Director, praised the policies of Prime Minister Mahathir Mohamad, in particular the country's use of capital controls in the aftermath of the 1997 currency crises.²

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 in the 1990s has attracted considerable attention from policy

I thank Roberto Alvarez for excellent assistance.

1. The protectionist agricultural policies of the advanced countries have undoubtedly helped fuel the antiglobalization sentiments.

2. *Financial Times*, 15 September 2003, p. 16.

External Vulnerability and Preventive Policies, edited by Ricardo Caballero, César Calderón, and Luis Felipe Céspedes, Santiago, Chile. © 2006 Central Bank of Chile.

analysts and academics and has been the subject of numerous studies.³ 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 that most countries in the world have effectively moved toward a greater degree of capital mobility. Table 1 presents data on a new index on capital account restrictions for six regions in the world for the period 1970–2000. This index is constructed by combining data from Quinn (2003) and Mody and Murshid (2002), with country-specific information; it ranges from 1 to 100, with higher numbers denoting a greater degree of capital mobility. As may be seen in the table, every region in the world experienced an increase in the degree of capital mobility during the period under study. The industrial countries experienced the greatest progress toward capital account liberalization, while the countries in the Middle East and Northern Africa moved at the slowest pace.

Table 1. The Evolution of Capital Account Openness, 1970–2000^a

<i>Group of countries</i>	<i>1970–89</i>			<i>1990–2000</i>		
	<i>Mean</i>	<i>Median</i>	<i>Standard deviation</i>	<i>Mean</i>	<i>Median</i>	<i>Standard deviation</i>
Industrial	66.5	75	21.7	88.8	100	15.2
Latin America and the Caribbean	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
Middle East and North Africa	62.3	75	25.0	66.3	75	23.4
Eastern Europe	—	—	—	60.0	50	17.2

Source: Author's construction, using the methodology described in the text.

a. The capital account openness index ranges from zero to one hundred, with higher values indicating a greater degree of openness.

This paper analyzes 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

3. See, for example, De Gregorio, Edwards, and Valdés (2000).

costs and benefits. Most of the potential costs are related to possible increases in corruption and to microeconomic inefficiencies.⁴ 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 these issues, I focus on controls on both capital inflows and capital outflows, and I briefly discuss the important issue of the sequencing of reforms and the timing of liberalization of the capital account of the balance of payments. The core of the paper comprises an empirical analysis of the relation between capital account restrictions and vulnerability to crises. I use a new cross-country data set to analyze two specific issues: whether capital controls reduce the probability of a major external crisis and whether restrictions on capital mobility reduce the negative consequences of external crises.

The paper is organized as follows. Section 1 deals 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. Section 2 evaluates the evidence on the effectiveness of restricting capital mobility. I divide the discussion into three parts: restrictions on capital inflows, restrictions on capital outflows, and the appropriate sequencing of economic liberalization. Section 3 reports some new results on the relation between capital account restrictions and external crises. This analysis focuses on current account reversals and addresses whether restrictions on capital mobility reduce the probability of reversals. I also investigate whether capital controls reduce the costs of these reversals, once they have occurred. Finally, Section 4 provides some concluding remarks.

1. 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

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

consequences, including the misallocation of resources, a decline in investment, and an increase in corruption.⁵ On the other hand, restricting capital mobility could have some potential benefits in the emerging and transition countries, such as the possible reduction in vulnerability to crises and increased freedom for the authorities 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. 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, 2001, for a review of this type of study).

In this section, I discuss the policy objectives of capital controls and explore policymakers' goals in restricting capital mobility. Although I do not deal with the costs of capital account restrictions, the analysis presented here puts the issues into perspective and organizes the discussion on managing the capital account.⁶

Proponents of capital account restrictions in emerging and transition economies argue that limiting capital mobility will allow the emerging and transition economies to achieve several policy goals. Generally speaking, modern discussions on the subject emphasize the following four policy objectives: reducing vulnerability to external shocks and potential financial crises; avoiding real exchange rate appreciation; increasing the degree of monetary independence; and reducing the costs of currency crises. I discuss each in turn.

—Reducing vulnerability to external shocks and potential financial crises. Most authors argue that this objective would be best achieved by limiting short-term—or speculative—capital movements. This is generally an argument for the imposition of restrictions on capital inflows, in particular, those that are short term. The idea behind this proposition is very simple. It 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 (in other words, if there is no “capital flight”), then a currency crisis is very unlikely.⁷ Many authors that support this view argue that, because of moral

5. See Rogoff (1999).

6. See, however, Forbes (2004), Desai, Foley, and Hines (2004), and Gallego and Hernández (2003) for good discussions on the costs of these policies.

7. Controls on inflows are supported by a number of prominent economists, including Stiglitz, Portes, Krugman, and Eichengreen.

hazard and other market imperfections, domestic firms and banks will overborrow from abroad in the absence of capital control (McKinnon and Pill, 1999). Supporters of this policy almost invariably refer to Chile's experience with controls on capital inflows to illustrate the merits of this system. Stiglitz, the ardent critic of globalization, has said, "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."⁸ Ito and Portes (1998) and Eichengreen (1999), among others, endorse this view. Some supporters of this view go beyond the case of Chile, arguing 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).

—Avoiding real exchange rate appreciation. A common problem during a market-oriented reform process is that the country undertaking the reforms tends to be flooded with capital inflows. This generates forces toward real exchange rate appreciation and thus reduces the country's degree of international competitiveness. Calvo and others (1993) document this phenomenon in great detail for the case of the Latin American nations. If, as many authors argue, capital inflows overshoot their long-run (sustainable) level in the short term, the real appreciation will be destabilizing and will have to be reversed at some time in the future. 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 relation between capital controls and monetary policy also emphasize the costs of sterilizing large capital inflows in emerging and transition economies. It is precisely for this reason that some authors—including those that deal with the "sequencing of liberalization"—argue that capital controls, and in particular controls on inflows, will help avoid real exchange rate appreciation during the transition. (For more information on the on the sequencing of reform, see section 2.3 of this paper.)

—Increasing the degree of monetary independence. One of the alleged virtues of capital controls is that, in the presence of a pegged exchange rate, they give the country in question greater control over its monetary policy. That is, in the presence of controls, the local monetary authorities

8. *The New York Times*, 1 February 1998.

will have the ability to affect domestic short-term interest rates. In fact, this increased control over monetary policy is one of the reasons given in support of the imposition of this type of control in the Asian nations (Summers, 2000).⁹ This idea is 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.

Some authors argue 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 of interest in intermediate exchange regimes and, thus, in using some form of restrictions on capital movements to allow for greater monetary independence. This “monetary independence” argument calls for policies that decouple domestic and international interest rates. That is, 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 the greatest monetary independence at the lowest cost in terms of distortions. Economists increasingly argue that the objective of monetary independence is best achieved by implementing some form of restriction on capital inflows, or at least on short-term ones.

—Reducing the costs of currency crises. Some authors, including Krugman (1999) and Kaplan and Rodrik (2002) argue that temporary controls on capital outflows would allow countries that have suffered a currency crisis to lower interest rates and establish progrowth policies.¹⁰ According to this view, controlling capital outflows would also give crisis countries additional time to restructure their financial sector in an orderly fashion. Controls are to be dismantled once the economy is back on its feet. As should be clear, this is an argument for controlling capital outflows in the aftermath of a currency crisis. This same argument calls for tightening controls in the case of countries that already had some sort of control before the crisis.

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

10. See also Stiglitz (2002).

This will allow the country to take a “time out” during a difficult period and gain time to put things in order. Much of the recent discussion on this particular objective of capital controls is 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 toward a currency collapse, should impose temporary controls on outflows as a way to avoid the crisis. The controls on outflows should be relaxed once the crisis has been avoided and macroeconomic conditions “normalized.”¹¹

Historically, capital controls have also played an important role in policies aimed at intervening heavily in the domestic capital market. 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 nonmarket 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. The country in question would thus experience severe capital flight in the absence of capital controls on outflows. In recent years, however, these “financial repression” policies have largely been abandoned.

Table 2 provides a summary of the policy objectives that the modern literature on macroeconomic management associates with capital controls. The table includes a brief description of the mechanisms that are supposed to help achieve these objectives, information on whether the specific policy objective calls for controls on inflows, control on outflows, or both, and some general comments.

Whether capital controls have indeed been effective 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 2), and I discuss new results pertaining to the relation between capital account restrictions, crisis vulnerability, and the costs of external crises (section 3).

11. This policy objective may be combined with any (or all) of the previous three policy goals. For instance, a country may apply controls on inflows in order to increase its monetary independence. If it faces a speculative attack, it may temporarily tighten its controls on outflows.

Table 2. Summary of the Objectives of Capital Account Management Policies

<i>Policy objective</i>	<i>Mechanisms at work</i>	<i>Type of restrictions</i>	<i>Comments</i>
Reduce vulnerability to external crises	<ul style="list-style-type: none"> — Tilt capital flows towards longer maturities. — Avoid overborrowing by domestic firms; reduce exposure to balance sheet effects. 	<ul style="list-style-type: none"> — Controls on inflows are favored, in particular restrictions on short-term speculative flows. 	<ul style="list-style-type: none"> — Chilean-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). — Bank supervision is an important policy that could deal with most of the vulnerabilities generated by the inflows.
Avoid excessive real exchange rate appreciation	<ul style="list-style-type: none"> — Controlling inflows reduces hikes in aggregate expenditure. — Financing expenditure on nontradables (including real estate and construction) may lead to significant appreciation. — It is important to determine whether capital inflows overshoot following reforms. 	<ul style="list-style-type: none"> — Controls on inflows are favored. — A key problem with inflows is that sterilization can be very costly. — The key is to reduce the percentage of the flows spent on nontradables. 	<ul style="list-style-type: none"> — The real appreciation problem seems to affect different countries diversely: in the 1990s, it was severe in Latin America, but much less so in Southeast Asia.

Table 2. (continued)

<i>Policy objective</i>	<i>Mechanisms at work</i>	<i>Type of restrictions</i>	<i>Comments</i>
Independent monetary policy	<ul style="list-style-type: none"> — With free capital mobility, domestic and international interest rates are closely linked, which makes it hard to pursue an independent monetary policy. — Fear of floating is an issue. — This is particularly the case in countries with predetermined nominal exchange rates, where monetary policy is endogenous. 	<ul style="list-style-type: none"> — Either controls on inflows or controls on outflows could, in principle, unhinge domestic and international interest rates. 	<ul style="list-style-type: none"> — Independent monetary policy could be achieved under flexible exchange rates. — Countries that combine flexible rates with inflation targeting have done well.
Reduce costs of crises and make crisis resolution policies more effective	<ul style="list-style-type: none"> — The traditional (IMF-associated) post crisis policies include a severe hiking of domestic interest rates. — This generates recessionary forces and increases bankruptcies. — Lowering interest rates could provide some alleviation: this requires controls on outflows to avoid capital flight. 	<ul style="list-style-type: none"> — Calls for temporary controls on outflows. — Temporary controls on outflows are also advocated when countries are facing speculative attacks or moving toward a crisis. 	<ul style="list-style-type: none"> — A key aspect of these policies is the temporary nature of the tighter controls. — These policies may be—and historically have been—combined with controls on inflows.

Source: Author's elaboration.

2. HOW EFFECTIVE ARE CAPITAL CONTROLS?

This section discusses the empirical evidence on the effectiveness of capital controls. I have divided the discussion in three parts: controls on inflows; the evidence on controls on outflows; and transitional issues and the sequencing of economic liberalization. In each of these subsections, I refer to the controls' policy objectives discussed above.

2.1 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. This section analyzes two episodes in Chile's recent history when capital controls on inflows were imposed. The first episode took place in the late 1970s and early 1980s, while the second took place in 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 it is one of the most important exhibits in the activists' case against capital mobility. The rest of the subsection is divided into two parts, based on Chile's experience with controls on inflows in the 1970s and the 1990s.¹²

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.¹³ The vast majority of these funds was intermediated by local banks, which provided foreign-currency-denominated loans to final users. The authorities feared that these inflows would pressure the real exchange rate toward appreciation and thus have a negative effect on export performance. Mostly for this reason, starting in 1977 the authorities implemented a novel system for slowing down the flow of capital into the country. This policy was based on unremunerated reserve

12. Chile is not the only country that has relied on this mechanism. Colombia in the 1990s is another notable example. See Cárdenas and Barrera (1997) and Edwards (2000a).

13. On Chile's market-oriented reforms, see, for example, Edwards and Cox-Edwards (1991).

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 reserve requirements ranging from 10 percent to 25 percent of the value of the loan.¹⁴

Three things stand out from this episode. First, total foreign indebtedness increased very rapidly despite the existence of these restrictions, almost tripling between 1978 and 1982. It is important to note that most of this new debt was private sector debt. In fact, private (nominal) foreign debt increased by more than twenty-three times between 1973 and 1981, growing at an average annual rate of almost 40 percent in real terms. Second, the level of foreign indebtedness of the private banking system also grew very rapidly. Third, virtually all of these funds were contracted in maturities exceeding twenty-four months. That is, given that the unremunerated reserve requirements were in effect throughout the period, Chile did not receive short-term (or, as it is 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 percent of GDP, and in 1981 they were equal to 14 percent of GDP. In 1982, a combination of factors led to 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 the country suffered a massive currency crisis in June 1982. Within a few months, the peso-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 fell 14 percent, unemployment surpassed 25 percent, and the banking sector suffered a major collapse and had to be bailed out by the government at a cost that exceeded 25 percent of GDP. All of this took place in an environment in which short-term capital inflows had been controlled quite severely.

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 bank supervision is lax and antiquated, as was the case in Chile at the time. Moreover, this episode shows that countries can face

14. For greater detail, see Edwards and Cox-Edwards (1991) and Harberger (1985).

extremely severe currency crises even if so-called speculative capital is restricted. 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.¹⁵

Chile's experience with controls on capital inflows in the 1990s

Chile reintroduced restrictions on capital inflows in June 1991. Initially, all inflows were subject to a 20 percent 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 lasted one year. In July 1992, the rate of the reserve requirement was raised to 30 percent, and its holding period was set at one year, regardless of the length of stay of the flow. Its coverage was extended to trade credit and to loans related to foreign direct investment. Additional changes were introduced in 1995, when the reserve requirement coverage was extended to Chilean stocks traded on the New York Stock Exchange (American Deposit Receipts), and to “financial” foreign direct investment (FDI). In June 1998, pressure from the East Asian crisis led the authorities to lower the rate of the reserve requirement to 10 percent, and in September of that year the deposit rate was reduced to zero. Throughout this period Chile also regulated foreign direct investment: FDI was subject to a three-year minimum stay in the country until 1992, when the minimum stay was reduced to one year.¹⁶

The authorities had three goals in mind when they reintroduced the control policy in 1991:

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

—Third, to allow the Central Bank to maintain a high differential between domestic and international interest rates. This was expected

15. On the economics of sudden stops of capital inflows, see, for example, Calvo (2003).

16 For further detail, see Massad (1998a, 1998b), De Gregorio, Edwards, and Valdés (2000), and Budnevich and Lefort (1997).

to support 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, 1998b; Valdés-Prieto and Soto, 1996a; Edwards, 1999; and De Gregorio, Edwards, and Valdés, 2000).

Chile's controls were thus 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 on both the length of time the funds stay in the country and the opportunity cost of these funds. As shown by Valdés-Prieto and Soto (1996a) and De Gregorio, Edwards, and Valdés (2000), the tax equivalent for funds that stay in Chile for k months, is given by the following expression:

$$\tau(k) = \left[r^* \left(\frac{\lambda}{1-\lambda} \right) \right] \left(\frac{\rho}{k} \right), \quad (1)$$

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 (measured in months) that the deposit will be kept in the Central Bank.

An inspection of equation (1) reveals two characteristics of the Chilean capital controls scheme of the 1990s. First, the tax rate is inversely related to the time the funds are in the country. This 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 a three-year period. In 1997, for example, the average tax for three-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)) changes through time.

Data on the composition of capital inflows into Chile reveal marked change following the imposition of the controls in 1991, with short-term flows (that is, less than a year) declining steeply relative to longer-term ones (De Gregorio, Edwards, and Valdés, 2000). The fact that this change in composition happened immediately after the implementation of the policy provides some support for the view that the 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, Edwards, and Valdés (2000) use 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 percent in 1990 to less than 5 percent in 1997.

A simple analysis of the raw data, however, tends to understate Chile's vulnerability to shocks stemming from international financial instability. Under standard practice, data flows have been classified as "short term" or "long term" on the basis 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. 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 foreign liabilities that mature within a year. The Bank for International Settlements provides data on residual maturity for loans extended by G10 banks to a group of selected Latin American and East Asian countries. An analysis of those data provides important insights. First, the percentage of short-term debt does not look as low when data on residual maturity are used as when contracting maturities are considered. Second, the Bank for International Settlements data indicate that Chile's short-term residual debt was not significantly lower in the mid-1990s 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 mid-1996, short-term residual debt was 53 percent of total debt in Argentina, 58 percent in Chile, and 49 percent in Mexico.

A number of authors use regression analysis to investigate the determinants of capital flows in Chile. Soto (1997) and De Gregorio, Edwards, and Valdés (2000), for example, use vector autoregression analysis on monthly data to analyze the effects of changes in the inflows' tax equivalent. Their results indicate that the tax on capital movements discouraged short-term inflows. These analyses suggest, however, that the reduction in short-term flows was fully compensated by increases in longer-term capital inflows and, consequently, that aggregate capital moving into Chile was not altered by this policy. Moreover, Valdés-Prieto and Soto (1998) argue 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 (on either outflows or inflows) is that it is relatively easy for investors to avoid them. Valdés-

Prieto and Soto (1998), for example, argue that Chile's controls have been subject to considerable evasion despite the authorities' efforts to close loopholes. Cowan and De Gregorio (1998) acknowledge this fact and construct 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 a value of zero if there is complete evasion. According to their paper, this index reached its lowest value in the second quarter of 1995; by late 1997 and early 1998, this index had reached a value of 0.8.

Empirical results by Edwards (2000a, 2000b) and Edwards and Susmel (2003) show that during the second half of the 1990s—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" from the crisis 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 Chile's capital controls in the 1990s were not very successful in helping achieve the authorities' two other objectives: avoiding real exchange rate overvaluation and increasing monetary independence. As pointed out earlier, one of the fundamental purposes of Chile's restrictions on capital inflows was to reduce their volume and, therefore, their pressure on the real exchange rate. According to a paper coauthored by a senior official in the Ministry of Finance, "Growing concerns [about]... the real exchange rate pressure of capital inflows... led policymakers to introduce specific capital controls" (Cowan and De Gregorio, 1998, p. 3).

Valdés-Prieto and Soto (1996b) argue that the imposition of these restrictions in mid-1991 reflected the authorities' attempt to balance two policy objectives: reducing 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, while also maintaining 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 show that the imposition of capital controls was not successful in avoiding real exchange rate appreciation. Valdés-Prieto and Soto (1996a, 1996b), Cowan and De Gregorio (1998), Edwards (1999), and De Gregorio,

Edwards, and Valdés (2000) all arrive at this conclusion using a variety of statistical and econometric techniques. For instance, Valdés-Prieto and Soto (1996b) conclude that “the unremunerated reserve requirement does not affect in any way the long-run level of the real exchange rate... In 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.

Another fundamental objective of the capital controls policy implemented in Chile between 1991 and 1998 was to allow the country to maintain high domestic interest rates, in a context of a predetermined nominal exchange rate policy.¹⁷ According to Cowan and De Gregorio (1998, p. 16), an important purpose of the controls policy was to “allow policymakers to rely on the domestic interest rate as the main instrument for reducing inflation.” The authors go on to claim that “the 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 use 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 Gregorio, Edwards, and Valdés (2000), use vector autoregression (VAR) analysis to conclude that after the controls were imposed, the Central Bank had a greater ability to alter short-term interest rates in the very short run. Edwards (1998c) uses 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. The paper concludes that the restrictions on capital inflows imposed in 1991 did not have a significant effect on the level or dynamic behavior of either short- or long-term interest rates in Chile. These results suggest that, contrary to the authorities’ goals, capital controls did not provide increased control over monetary policy. These findings are consistent with the results reported by Calvo and Mendoza (1999), who find that the decline in Chile’s inflation in

17. 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 restrictions associated with the so-called impossibility of the holy trinity.

1990–98 was largely unrelated to the authorities' attempts to target interest rates. According to Calvo and Mendoza's (1999) VAR analysis, the main forces behind Chile's disinflation were 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, based on a large number of careful and detailed econometric studies, is mixed with respect to the effectiveness of Chile's controls on capital inflows. The controls of the 1970s and 1980s were unable to preclude a major crisis, and while the 1990s episode was more successful, it still had a number of limitations. Although the controls lengthened 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.

2.2 Controls on Capital Outflows

Supporters of restricting capital mobility, such as Krugman (1999), Rodrik (1998), and Stiglitz (2002), argue that temporary controls on capital outflows will allow crisis countries to lower interest rates and apply progrowth policies. According to this view, controlling capital outflows would also give crisis countries additional time to restructure their financial sector in an orderly fashion.¹⁸ The controls should then be dismantled once the economy is back on its feet. The historical evidence, however, does not support the view that countries that tighten controls on capital outflows emerge from a crisis faster, or on better footing, than countries that don't. Two historical studies of over forty major currency crises in Latin America both find that 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.¹⁹

The 1980s debt crisis provides an 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—muddled through and experienced a long and painful decline in growth, high inflation and rampant

18. See Krugman (1999), for example.

19. See Edwards (1989) and Edwards and Santaella (1993) for details on these crisis episodes.

unemployment. Moreover, the stricter controls on outflows did not encourage the restructuring of the domestic economies, nor did they result in orderly reforms. The opposite happened, in fact. In all of these countries, politicians experimented with populist policies that ultimately deepened the crisis. Mexico nationalized the banking sector and expropriated dollar-denominated deposits. Argentina and Brazil created new currencies (namely, the austral and the cruzado, both of which were eventually eliminated, victims of hyperinflation) while at the same time controlling prices and expanding public expenditure. In Peru, tighter controls on outflows allowed the García administration to systematically erode the bases of a healthy and productive economy, as the country was rapidly consumed by a virtual civil war. In none of these countries were controls on capital outflows successful in slowing down capital flight.

Chile and Colombia offer an interesting contrast. Neither of these countries significantly tightened controls on capital outflows. Instead they made an effort to restructure their economies and to provide the right type of incentives for nationals to repatriate capital held abroad. Chile also 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 per capita GDP 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 and Poor's and Moody's.

Recent experiences with currency crises also suggest that capital controls may give a false sense of security, encouraging complacent and careless behavior on behalf of policymakers 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 policymakers believed that the existence of restrictions on capital mobility made Korea largely immune to a currency crisis—to the extent that, after giving the Korean banks and the stance of the Central Bank the next to worst ratings, Goldman Sachs argued, in its *Emerging Markets Biweekly*, that these indicators should be excluded from the computation of the overall vulnerability index because Korea had “a relatively closed capital account.” Consequently, Goldman Sachs played down the extent of Korea's problems throughout most of 1997. Had Goldman

Sachs (correctly) recognized that capital restrictions cannot truly protect an economy from financial weaknesses, it would have clearly anticipated the Korean debacle, as it anticipated the Thai meltdown.

Controls on the free mobility of capital also gave a false sense of security to Brazilian policymakers in 1997–98. These authorities repeatedly argued that since short-term capital inflows were restricted, the Brazilian currency could not suffer the same fate as the Mexican peso. They were wrong. Once the collapse of the real became imminent, domestic and foreigner investors rushed to flee the country. More recently, the 2003 experience of Venezuela clearly demonstrates 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 ultimately amplify the magnitude of the eventual crisis.

Nobel Laureate Joe Stiglitz has been particularly critical of the opening of the capital account—to both outflows and inflows. 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 yet recovered quickly, support his views on the costs of opening up the capital account (Stiglitz, 2002). 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 adds a different angle to the discussion. It recovered quickly after the 1997 crisis—although not as fast as South Korea—but it is not clear that the recovery was the result of the imposition of capital controls and the fixing of the exchange rate. Kaplan and Rodrik (2002) 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 bank analysts argued that these controls—and the accompanying decisions to peg the exchange rate and lower domestic interest rates—would slow recovery and significantly reduce foreign direct investment into Malaysia. This latter (potential) effect of the controls was considered to be particularly devastating, as Malaysia has traditionally relied heavily on FDI. Kaplan and Rodrik argue that this general perception is incorrect, and that evidence based on appropriate econometric techniques suggests that Malaysia's unorthodox program yielded very positive results. Dornbusch

(2002) takes issue with this view, arguing 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 primarily by successive cuts in interest rates by the Federal Reserve, was the main force behind Malaysia's recovery of 1999–2000.

A full understanding of the Malaysian episode will require additional research. That said, Malaysia surprised many observers by tightening controls only temporarily; and once the economy had stabilized, the controls were lifted, just as Dr. Mahatir had originally announced. Historically, the temporary use of controls is quite rare. The 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.

2.3 Capital Account Liberalization and the Sequencing of Reform

From a policy perspective, a particularly important question involves the speed and sequencing of liberalization. The key issues 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 argue 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. It has been addressed over and over again since the beginning of the economics profession. Adam Smith, for example, argued in *The Wealth of Nations* that determining the appropriate sequencing was a difficult issue that involved, primarily, political considerations.²⁰ Smith supported gradualism on the grounds that cold-turkey liberalization would result in a significant increase in unemployment: “To 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. 2, chap. 7, part 3, p. 120).

The issues of speed and sequencing were also central in analyses of 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, Václav Klaus points out that one of the main

20. See the Cannan edition, book 4, chap. 7, part 3, p. 121.

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, p. 18).

In the early 1980s the World Bank became interested in exploring issues related to the sequencing and speed of reform. Papers were commissioned, conferences were organized, and different country experiences were analyzed. As a result of this work, a consensus of sorts developed around five key points: trade liberalization should be gradual and buttressed with substantial foreign aid; an effort should be made to minimize the unemployment consequences of reform; countries with very high inflation should deal with fiscal imbalances very early in the reform process; financial reform requires the creation of modern supervisory and regulatory agencies; and the capital account should be liberalized at the very end of the process and only after the economy has successfully expanded its export sector. 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. Frenkel (1983) argues that the capital account should be opened toward the end of the reform process. It thus seems fair to say that by the late 1980s, the idea of gradualism and a sequencing in which the capital account came last had become part of the received wisdom.

Mundell (1995) also endorses this general view on sequencing: “Unfortunately... 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).

Mundell thus acknowledges that the probability a government bailout of private borrowers constitutes a serious externality. Other analysts, such as Stiglitz (2002), fail 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. Specifically, he states that a 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 about” (p. 200).

The received wisdom on the sequencing of capital account liberalization began to change in the 1990s, and economists at both 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 Guitián, then a senior official at the IMF, who in 1995 argued in favor of moving quickly towards capital account convertibility. Guitián'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 view regarding sequencing and capital account convertibility. After discussing the evolution of international financial markets and expressing reservations about the sequencing recommendation to leave the capital account for last, Guitián summarizes his perspective 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" (Guitián, 1995, p. 85–86).

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 the second half of the 1990s. They tended to follow different strategies and paths. While some countries only relaxed bank lending, others 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 United States to open their capital account. Indonesia and Mexico, to mention two important cases, had a long tradition of free capital mobility, which preceded the events discussed in the 1990s, and they never had any intention of following a different policy.

In the aftermath of the crises of the 1990s, a number of authors, including economists at the multilateral institutions, began to reinvestigate the sequencing issue. The idea that an early liberalization may not be beneficial after all again gained 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 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. Recent research using improved measures of the degree of openness

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

3. CAPITAL ACCOUNT RESTRICTIONS AND VULNERABILITY TO CRISES: SOME NEW RESULTS

As pointed out earlier, the main objectives of policies aimed at restricting capital mobility include reducing a country's vulnerability to external crises (Rodrik, 1998) and minimizing the damage once a crisis has occurred (Stiglitz, 2002). Although these arguments may seem plausible, efforts to investigate empirically whether this has indeed been the case have been limited. In this section, I report some new empirical work that addresses these issues.²¹ The analysis focuses on the occurrence of current account reversals, a crisis-related phenomenon that tends to be very costly in terms of reduced growth. Specifically, I ask two questions that are directly related to the degree of openness of the capital account:

—To what extent does financial openness affect the probability of a country's 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 (that is, GDP growth)?

I also address the related issues of whether the existence of restrictions on capital mobility reduces the costs of external crises (that is, current account reversals) and whether the exchange rate regime affects 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 percent of GDP in one year. An interesting question is how current account reversals relate to the sudden stop of capital inflows. To make a formal comparison, I define a sudden stop

21. This discussion is partially based on Edwards (2004a).

as 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 percent of GDP in one year (see Edwards, 2004b, for details).

Using a panel data set encompassing 157 countries, I find that the 1970–2001 period was characterized by a 5.8 percent incidence of sudden stops and an 11.8 percent incidence of reversals. Not surprisingly, these two phenomena are closely related, but the relation is less than perfect. Historically, many sudden stops were not related with reversal episodes. This indicates that many countries facing a sudden stop effectively used their international reserves to avoid an abrupt current account adjustment. At the same time, a number of countries went 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 they had financed their large deficits by drawing down international reserves (see Edwards, 2004b).

As shown in table 3, for the complete sample (2,228 observations), 46.9 percent of countries subjected to a sudden stop faced a current account reversal. At the same time, 22.9 percent of those with reversals also experienced a sudden stop in the same year. The joint incidence of reversals and sudden stops is highest in Africa, where approximately 62 percent of sudden stops happened at the same time as current account reversals, and almost 30 percent of reversals coincided with sudden stops. For every one of the regions, as well as for the complete sample, Pearson chi-squared 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 chi-squared statistic for the null hypothesis of independence of distributions has a value of 159.8. These results do not change significantly if I use different definitions of reversals and sudden stops or different configurations of lags and leads.

Table 3. Current Account Reversals and Sudden Stops

<i>A. All countries</i>			
<i>Presence of reversal</i>	<i>No sudden stop</i>	<i>Sudden stop</i>	<i>Total</i>
No reversal (no. episodes)	1892	69	1961
	96.5	3.5	100
	90.2	53.1	88.0
Reversal (no. episodes)	206	61	267
	77.1	22.9	100
	9.8	46.9	12.0
Total (no. episodes)	2098	130	2228
	94.2	5.8	100
	100	100	100
Summary statistic			
Pearson χ^2 (1)	159.8		
<i>p</i> value	0.0		
<i>B. Industrial countries</i>			
<i>Presence of reversal</i>	<i>No sudden stop</i>	<i>Sudden stop</i>	<i>Total</i>
No reversal (no. episodes)	539	18	557
	96.8	3.2	100
	98.2	81.8	97.6
Reversal (no. episodes)	10	4	14
	71.4	28.6	100
	1.8	18.2	2.5
Total (no. episodes)	549	22	571
	96.2	3.8	100
	100	100	100
Summary statistic			
Pearson χ^2 (1)	21.1		
<i>p</i> value	0.0		
<i>C. Latin America and Caribbean</i>			
<i>Presence of reversal</i>	<i>No sudden stop</i>	<i>Sudden stop</i>	<i>Total</i>
No reversal (no. episodes)	578	23	601
	96.2	3.8	100
	87.2	44.2	84.1
Reversal (no. episodes)	85	29	114
	74.6	25.4	100
	12.8	55.8	15.9
Total (no. episodes)	663	52	715
	92.7	7.3	100
	100	100	100
Summary statistic			
Pearson χ^2 (1)	18.4		
<i>p</i> value	0.0		

Table 3. (continued)

<i>D. Asia</i>			
<i>Presence of reversal</i>	<i>No sudden stop</i>	<i>Sudden stop</i>	<i>Total</i>
No reversal (no. episodes)	294	12	306
	96.1	3.9	100
	87.5	48.0	84.8
Reversal (no. episodes)	42	13	55
	76.4	23.6	100
	12.5	52.0	15.2
Total (no. episodes)	336	25	361
	93.1	6.9	100
	100	100	100
Summary statistic			
Pearson χ^2 (1)	9.6		
<i>p</i> value	0.002		
<i>E. Africa</i>			
<i>Presence of reversal</i>	<i>No sudden stop</i>	<i>Sudden stop</i>	<i>Total</i>
No reversal (no. episodes)	579	21	600
	96.5	3.5	100
	85.8	37.5	82.1
Reversal (no. episodes)	96	35	131
	73.3	26.7	100
	14.2	62.5	17.9
Total (no. episodes)	675	56	731
	92.3	7.7	100
	100	100	100
Summary statistic			
Pearson χ^2 (1)	60.6		
<i>p</i> value	0.0		
<i>F. Middle East</i>			
<i>Presence of reversal</i>	<i>No sudden stop</i>	<i>Sudden stop</i>	<i>Total</i>
No reversal (no. episodes)	193	12	205
	94.2	5.8	100
	87.7	50.0	84.0
Reversal (no. episodes)	27	12	39
	69.2	30.8	100
	12.3	50.0	16.0
Total (no. episodes)	220	24	244
	90.2	9.8	100
	100	100	100
Summary statistic			
Pearson χ^2 (1)	22.4		
<i>p</i> value	0.0		

Source: Author's elaboration.

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 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 (Frenkel and Razin, 1987). Calvo, Izquierdo, and Mejía (2004) develop a model in which sudden stops result in abrupt current account reversals and 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. The authors argue that sudden stops and current account reversals will have a greater impact in closed economies, such as Argentina, than in relatively open ones, such as Chile.

Previous empirical works on the effects of current account reversals on real economic performance reach different conclusions. Milesi-Ferretti and Razin (2000), for example, conclude that reversals “are not systematically associated with a growth slowdown” (p. 303). Edwards (2002), on the other hand, uses dynamic panel regressions and concludes that major current account reversals has a negative effect on investment and on GDP per capita growth, even after controlling for investment. Neither of these papers, however, analyzes the interaction between either openness or the exchange rate regime and the costs of current account reversals.

3.1 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.

$$g_j^* = \phi + \mathbf{x}_j\beta + \omega_j \tag{2}$$

$$\Delta g_{t,j} = \lambda (g_j^* - g_{t-1,j}) + \varphi v_{t,j} + \gamma \delta_{t,j} + \theta (\delta_{t,j} \text{OPENNESS}_{t,j}) + \xi_{t,j} \tag{3}$$

$$\delta_{t,j} = \begin{cases} 1 & \text{if } \delta_{t,j}^* > 0 \\ 0 & \text{otherwise} \end{cases} \tag{4}$$

$$\delta_{t,j}^* = \mathbf{w}_{t,j}\boldsymbol{\alpha} + \varepsilon_{t,j} \quad (5)$$

Equation (2) is a long-run growth equation, in which 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 w_j is an error term. Equation (3) is a growth dynamics equation, in which $(g_j^* - g_{t-1,j})$ is a partial adjustment term (the growth gap), $v_{t,j}$ is a terms-of-trade shock, and $\delta_{t,j}$ is a dummy variable (that is, 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, δ is the parameter of interest: the effect of the treatment on the outcome. Finally, $(\delta_{t,j} \cdot \text{OPENNESS}_{t,j})$ is a variable that interacts $\delta_{t,j}$ with a measure of openness. Whether the country experiences a current account reversal is assumed to be the result of an unobserved latent variable, $\delta_{t,j}^*$, in equation (4); this variable, in turn, is assumed to depend on vector $\mathbf{w}_{t,j}$. Some of the variables in $\mathbf{w}_{t,j}$ may be included in $\mathbf{x}_{t,j}$. Exclusionary restrictions are imposed for identification purposes. Finally, β and α are parameter vectors, and $x_{t,j}$ and $e_{t,j}$ are error terms that are assumed to be bivariate normal, with a zero mean and a covariance matrix:

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

I use a two-step estimation procedure. Equation (2) is estimated using data for long-term averages and feasible least squares. Fitted values of long-term growth are used for g_j^* in equation (3). Equations (3) and (5) are then estimated jointly. The estimation of equation (3) includes terms that interact the dummy variable $\delta_{t,k}$ 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, which combines the Quinn (2003) index and the Mody and Murshid (2002) index on capital mobility. This new index ranges 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 variables in $\mathbf{w}_{t,j}$ in equation (4) is the index of financial integration described above.

In the long-run growth equation (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 economy's degree of openness; the ratio of government consumption to GDP; and regional dummies. Some specifications also include an index for the exchange rate regime. Results from the estimation of equation (2) are not reported due to space constraints.

In growth equation (3), $v_{t,j}$ is the change in the terms of trade, and $d_{t,j}$ is the current account reversals dummy. As stated, I also include the current account reversal dummy interacted with the trade openness variable and 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. I included the following covariates (all lagged one period): the ratio of the current account deficit to GDP; the external debt to GDP; net international reserves to GDP; the share of short-term external debt; the relative occurrence of sudden stops in the country's region; growth of domestic credit; the log of initial per capita GDP; an index of financial integration; and country-specific dummies.

3.2 Basic Results

Table 4 summarizes the basic results obtained from the estimation of a number of treatment models for GDP growth dynamics. The table contains two panels. The upper panel includes the results from the growth equation; the lower panel 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 4 also includes the estimated coefficient of the hazard lambda, as well as the estimated elements of the variance-covariance matrix (equation (5) above). The first three equations are for emerging markets. The last equation (column 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.

Table 4. Current Account Reversals, Openness, and Growth^a

<i>Variable</i>	(1)	(2)	(3)	(4)
<i>Growth equation</i>				
Growth gap	0.843** (33.1)	0.843** (33.1)	0.840** (32.8)	0.834** (33.1)
Change in terms of trade	0.062** (8.51)	0.061** (8.46)	0.061** (8.45)	0.066** (8.51)
Reversal	-6.025 (5.66)	-5.087 (3.86)	-2.710** (2.32)	-5.722 (6.64)
Reversal*trade openness	0.032** (3.66)	0.034** (3.78)		0.023** (3.08)
Reversal*financial openness		-0.024 (1.21)	-0.014 (0.74)	
<i>Treatment equation</i>				
Current acc. deficit to GDP (-1)	0.114** (9.82)	0.114** (9.82)	0.114** (9.82)	0.122** (10.78)
External debt to GDP (-1)	0.004** (2.30)	0.004** (2.30)	0.004** (2.30)	
Net int. reserves to GDP (-1)	-0.148* (1.78)	-0.148* (1.76)	-0.148* (1.76)	-0.188* (2.38)
Short-term external debt to external debt (-1)	0.001 (0.42)	0.001 (0.42)	0.001 (0.42)	
Incidence of reversals in region	1.522** (2.50)	1.524** (2.50)	1.524** (2.50)	1.556** (2.70)
Domestic credit growth (-1)	0.002 (1.32)	0.002 (1.32)	0.002 (1.32)	0.002* (1.78)
Log initial GDP per capita	-1.743** (7.51)	-1.743** (7.51)	-1.743** (7.51)	-0.845** (3.71)
Financial openness (-1)	-0.007 (1.54)	-0.007 (1.55)	-0.007 (1.55)	-0.009** (2.09)
Hazard 1	1.192** (2.49)	1.232** (2.57)	1.082** (2.25)	1.314** (3.23)
<i>Variance-covariance matrix</i>				
ρ	0.284	0.347	0.257	0.346
σ	4.611	4.606	4.208	3.804
<i>Summary statistic</i>				
Wald χ^2	1,634.1	1,174.2	1,221.9	1,916.9
No. observations	1,176	1,174	1,174	1,561

Source: Author's calculations.

* Statistically significant at 10 percent.

** Statistically significant at 5 percent.

a. The estimation method is a treatment effects model with two-step estimates. The treatment equation is a probit equation on the probability of experiencing a current account reversal; treatment observations correspond to current account reversal episodes. The sample used in the columns one through three is emerging markets; in column 4, it is for the complete sample of emerging and industrial countries. Variables denoted (-1) are lagged one period. Country-specific and year dummies are included but not reported. Absolute value of z statistics are in parentheses.

The probit estimates are presented in the lower panel of Table 4. 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 they tend not to be significant. The coefficient of the financial openness index is negative in all regressions, and it is significantly negative in column 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. Another possibility is that the authorities in countries with capital controls may become overconfident and tend to implement riskier macroeconomic policies.

The results from the estimation of the growth dynamics equation are reported in the top panel. The coefficients of the growth gap and the terms of trade have the expected signs and are significant. More importantly, the coefficients of the current account reversal dummy are always significantly negative, and the coefficient of the term that interacts trade openness and reversals is always significantly positive. In columns 2 and 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 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.

The interaction between the current account reversals dummy and the trade openness variable is particularly interesting. In all specifications in the table, 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 column 1:²²

Growth effects of reversals = $-6.025 + 0.032 \text{ TRADE_OPENNESS}$.

The trade openness variable varies significantly across countries. Its mean is 65 percent, its standard deviation is 35 percent, and its median is 67.4 percent. The first decile is 28.7 percent, and the ninth decile is 130.7 percent. 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 percent ($-6.025 + 0.032 \times 65 = -3.945$). If the country's degree of openness is equal to the first decile, the effect of a reversal on growth is more negative, -5.11 percent. If the country is very open to trade (with a degree of openness corresponding to the ninth decile), the effect of a reversal on growth is much smaller, at -1.84 percent.

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 sample into four alternative de facto regimes: hard peg; pegged, intermediate, and flexible (see Levy Yeyati and Sturzenegger, 2003, for the classification). I then compared the estimates of both the reversals treatment dummy and 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, at 0.373 (1.09); and the interactive term was 0.041 (3.43) for pegged and -0.044 (-1.01) for flexible regimes. A chi-squared test indicates that these differences in coefficients across regimes are significant. These results support the idea that flexible exchange rates act as shock absorbers, allowing countries to accommodate 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 depend on the country's degree of trade openness: more open countries will

22. I am ignoring the other coefficients from this equation. See table 4 for details.

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 better able to accommodate 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 improving indexes of financial integration and capital account restrictions.

4. CONCLUDING REMARKS

In this paper I have reviewed both the policy arguments used to justify restricting capital mobility and 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 their supporters claim. I have argued that the merits of Chilean-style controls on capital inflows are somewhat exaggerated, based on evidence that the effectiveness of this tool was limited. Chile itself abolished the controls more than five years ago, and the authorities have no intention of reinstating them in the future. I also argued that historically the experience with controls on outflows has tended to be negative: they don't help to reestablish growth, they encourage black markets and corruption, and they create a false sense of security. Malaysia in the 1990s is, perhaps, an exception to this proposition. The views on the evidence are contradictory, and 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—most notably, 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, historical and statistical evidence suggests that implementing a modern bank supervisory system before lifting

capital controls is crucial. However, the fact that there is an adequate and preferred sequencing does not mean that controls on capital mobility should never be lifted.

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

REFERENCES

- Budnevich, C. and G. Lefort. 1997. "Capital Account Regulation and Macroeconomics Policy: Two Latin American Experiences." Working paper 6. Santiago: Central Bank of Chile.
- Calvo, G.A. 2003. "Explaining Sudden Stops, Growth Collapse, and BOP Crises: The Case of Distortionary Output Taxes." Working paper 9864. Cambridge, Mass.: National Bureau of Economic Research.
- Calvo, G.A., A. Izquierdo, and L. F. Mejía. 2004. "On the Empirics of Sudden Stops: The Relevance of Balance-Sheet Effects." Working paper 10520. Cambridge, Mass.: National Bureau of Economic Research.
- Calvo, G.A., L. Leiderman, and C. M. Reinhart. 1993. "Capital Inflows and Real Exchange Appreciation in Latin America: The Role of External Factors." *IMF Staff Papers* 40(1): 108–51.
- Calvo, G.A. and M. Mendoza. 1999. "Empirical Puzzles of Chilean Stabilization Policy." In *Chile: Recent Policy Lessons and Emerging Challenges*, edited by G. Perry and D. M. Leipziger. Washington: World Bank.
- Cárdenas, M. and F. Barrera. 1997. "On the Effectiveness of Capital Controls: The Experience of Colombia during the 1990s." *Journal of Development Economics* 54(1): 27–58.
- Cowan, K. and J. De Gregorio. 1998. "Exchange Rate Policies and Capital Account Management." In *Managing Capital Flows and Exchange Rate Rates*, edited by R. Glick, 465–88. Cambridge University Press.
- De Gregorio, J., S. Edwards, and R. Valdés. 2000. "Controls on Capital Inflows: Do They Work?" *Journal of Development Economics* 63(1): 59–83.
- Desai, M.A., C.F. Foley, and J.R. Hines jr. 2004. Capital Controls, Liberalizations, and Foreign Direct Investment. Working paper 10337. Cambridge, Mass.: National Bureau of Economic Research.
- Dornbusch, R. 2002. "Malaysia: Was It Different?" In *Preventing Currency Crises in Emerging Markets*, edited by S. Edwards and J. Frankel. University of Chicago Press.
- Edwards, S. (1989) *Real Exchange Rates, Devaluation and Adjustment: Exchange Rate Policy in Developing Countries*. MIT Press.
- Edwards, S. 1998a. "Capital Flows, Real Exchange Rates, and Capital Controls: Some Latin American Experiences." Working paper 6800. Cambridge, Mass.: National Bureau of Economic Research.
- . 1998b. "Capital Inflows into Latin America: A Stop-Go Story?"

- Working paper 6441. Cambridge, Mass.: National Bureau of Economic Research.
- . 1998c. “Interest Rate Volatility, Contagion, and Convergence: An Empirical Investigation of the Cases of Argentina, Chile, and Mexico.” *Journal of Applied Economics* 1(1): 55–86.
- . 1999. “How Effective Are Capital Controls.” *Journal of Economic Perspectives* 13(4): 65–84.
- . 2000a. “Capital Flows, Real Exchange Rates, and Capital Controls: Some Latin American Experiences.” In *Capital Flows and the Emerging Economies*, edited by S. Edwards. University of Chicago Press.
- . 2000b. “Interest Rates, Contagion, and Capital Controls.” Working paper 7801. Cambridge, Mass.: National Bureau of Economic Research.
- . 2002. “Does the Current Account Matter?” In *Preventing Currency Crises in Emerging Markets*, edited by S. Edwards and J. Frankel. University of Chicago Press.
- . 2004a. “Financial Openness, Sudden Stops, and Current Account Reversals.” *American Economic Review* 94(2): 59–64.
- . 2004b. “Thirty Years of Current Account Imbalances, Current Account Reversals, and Sudden Stops.” Fourth Mundell-Fleming Lecture. *IMF Staff Papers* 51 (special issue).
- Edwards, S. and A. Cox-Edwards. 1991. *Monetarism and Liberalization: The Chilean Experiment*, 2nd ed. University of Chicago Press.
- Edwards, S. and J. Santaella, 1993. “Devaluation Controversies in the Developing Countries.” In *A Retrospective on the Bretton Woods System*, edited by M. Bordo and B. Eichengreen. University of Chicago Press.
- Edwards, S. and R. Susmel. 2003. “Interest Rate Volatility in Emerging Markets.” *Review of Economics and Statistics* 85(2): 328–48.
- Eichengreen, B.J. 1999. *Toward a New International Financial Architecture*. Washington: Institute for International Economics.
- . 2001. “Capital Account Liberalization: What Do the Cross-Country Studies Tell Us?” *World Bank Economic Review* 15(3): 341–65.
- . 2003. *Capital Flows and Crises*. MIT Press
- Fischer, S. 2003. “Financial Crises and Reform of the International Financial System.” *Review of World Economics* 139(1): 1–37.
- Forbes, K.J. 2003. “One Cost of the Chilean Capital Controls: Increased Financial Constraints for Smaller Traded Firms.” Working paper 9777. Cambridge, Mass.: National Bureau of Economic Research.

- Frenkel, J.A. 1983. "Panel Discussion on Southern Cone." *IMF Staff Papers* 30(1): 164–73.
- . 1991. "Quantifying International Capital Mobility in the 1980s." Working paper 2856. Cambridge, Mass.: National Bureau of Economic Research.
- Frenkel, J.A. and A. Razin. 1987. *Fiscal Policies and the World Economy: An Intertemporal Approach*. MIT Press.
- Gallego, F.A. and L. Hernández. 2003. "Microeconomic Effects of Capital Controls: The Chilean Experience during the 1990s." Working paper 203. Santiago: Central Bank of Chile.
- Gutián, M. 1995. "Capital Account Liberalization: Bringing Policy in Line with Reality." In *Capital Controls, Exchange Rates, and Monetary Policy in the World Economy*, edited by S. Edwards. Cambridge University Press.
- Harberger, A. 1985. "Observations on the Chilean Economy, 1973–1983." *Economic Development and Cultural Change* 33(3): 451–62.
- IMF (International Monetary Fund). 2003. *World Economic Outlook: Public Debt in Emerging Markets*. Washington: International Monetary Fund.
- Ito, T. and R. Portes. 1998. "Dealing with the Asian Financial Crises." *European Economic Perspectives* 17 (April).
- Kaplan, E. and D. Rodrik. 2002. "Did the Malaysian Capital Controls Work?" In *Preventing Currency Crises in Emerging Markets*, edited by S. Edwards and J. Frankel. University of Chicago Press.
- Klaus, V. 1990. "Perspective on Economic Transition in Czechoslovakia and Eastern Europe." *World Bank Research Observer* (supplement).
- Krugman, P. 1999. "Currency Crises." In *International Capital Flows*, edited by M. Feldstein, 421–40. University of Chicago Press for National Bureau of Economic Research.
- Levy-Yeyati, E. and F. Sturzenegger. 2003. "To Float or to Fix: Evidence on the Impact of Exchange Rate Regimes." *American Economic Review* 93(4): 1173–93.
- Massad, C. 1998a. "La política monetaria en Chile." *Economía Chilena* 1(1): 5-27.
- . 1998b. "The Liberalization of the Capital Account: Chile in the 1990s." *Essays in International Finance* 207. Princeton University.
- McKinnon, R. and H. Pill. 1999. "Exchange Rate Regimes for Emerging Markets: Moral Hazard and International Overborrowing." *Oxford Review of Economic Policy* 15(3): 19–38.

- Milesi-Ferretti, G.M. and A. Razin. 2000, "Current Account Reversals and Currency Crises: Empirical Regularities." In *Currency Crises*, edited by P. Krugman. University of Chicago Press.
- Mody, A. and A.P. Murshid. 2002. "Growing up with Capital Flows." Working paper 02/75. Washington: International Monetary Fund.
- Mundell, R. 1995. "Stabilization and Liberalization Policies in Semi-Open Economies." In *Capital Controls, Exchange Rate and Monetary Policy in the World Economy*, edited by S. Edwards. Cambridge University Press.
- Quinn, D.P. 2003. "Capital Account Liberalization and Financial Globalization, 1890–1999: A Synoptic View." *International Journal of Finance and Economics* 8(3): 189–204.
- Rodrik, D. 1998. "Who Needs Capital-Account Convertibility?" In *Should the IMF Pursue Capital-Account Convertibility?* Essay in international finance 207. Princeton University.
- Rogoff, K. 1999. "International Institutions for Reducing Global Financial Instability." *Journal of Economic Perspectives* 13(4): 21–42.
- Soto, C. 1997. "Controles a los movimientos de capitales: evaluación empírica del caso chileno." Santiago: Central Bank of Chile. Mimeographed.
- Stiglitz, J. 2002. *Globalization and its Discontents*. New York and London: W. W. Norton.
- Summers, L.H. 2000. "International Financial Crises: Causes, Prevention, and Cures." *American Economic Review* 90(2): 1–16.
- Valdés-Prieto, S. and M. 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.
- . 1996b. "New Selective Capital Controls in Chile: Are They Effective?" Catholic University of Chile. Mimeographed.
- . 1998. "The Effectiveness of Capital Controls: Theory and Evidence from Chile." *Empirica* 25(2): 133–64.