

This PDF is a selection from a published volume from the
National Bureau of Economic Research

Volume Title: Capital Controls and Capital Flows in Emerging
Economies: Policies, Practices and Consequences

Volume Author/Editor: Sebastian Edwards, editor

Volume Publisher: University of Chicago Press

Volume ISBN: 0-226-18497-8

Volume URL: <http://www.nber.org/books/edwa06-1>

Conference Date: December 16-18, 2004

Publication Date: May 2007

Title: Capital Controls: An Evaluation

Author: Nicolas Magud, Carmen M. Reinhart

URL: <http://www.nber.org/chapters/c0157>

Capital Controls

An Evaluation

Nicolas Magud and Carmen M. Reinhart

14.1 Introduction

The literature on capital controls has (at least) four very serious issues that make it difficult, if not impossible, to compare across theoretical and empirical studies. We dub these apples-to-oranges problems, and they are as follows. First, there is no unified theoretical framework (say, as in the currency crisis literature) to analyze the macroeconomic consequences of controls. Second, there is significant heterogeneity across countries and time in the capital control measures implemented. Third, there are multiple definitions of what constitutes success (capital controls are a single policy instrument—but there are many policy objectives). Fourth, the empirical studies lack a common methodology and are furthermore significantly overweighted by the two poster children—Chile and Malaysia.

Our goal in this paper is to find a common ground among the noncomparabilities in the existing literature. Of course, there is usually a level of generality that is sufficiently encompassing. After all, an apples-to-oranges problem can be solved by calling everything fruit. Our goal is, as far as possible, to classify different measures of capital controls on a uniform basis. Once done, it should be easier to understand the cross-country and time series experience.

We attempt to address some of these apples-to-oranges shortcomings by being very explicit about what measures are construed as capital controls. We document not only the more drastic differences across countries or

Nicolas Magud is an assistant professor of economics at the University of Oregon. Carmen M. Reinhart is a professor in the School of Public Affairs and the Department of Economics of the University of Maryland, and a research associate of the National Bureau of Economic Research.

The authors thank conference participants and Vincent R. Reinhart and Miguel A. Savastano for useful comments and suggestions.

episodes and between controls on inflows and outflows, but also the more subtle differences in types of inflow or outflow controls. Also, given that success is measured so differently across studies, we standardize (wherever possible) the results of over thirty empirical studies summarized in this paper. As far as possible, we bring to bear the experiences of episodes less well known than those of Chile and Malaysia.

The standardization was done by constructing two indexes of capital controls: indexes of capital controls effectiveness and weighted capital control effectiveness. The difference between them lies only in the fact that the WCCE controls for the differentiated degree of methodological rigor applied to draw conclusions in each of the papers considered.

Our results from these indexes can be summarized briefly. Capital controls on inflows seem to make monetary policy more independent, alter the composition of capital flows, and reduce real exchange rate pressures (although the evidence there is more controversial). Capital controls on inflows seem not to reduce the volume of net flows (and hence the current account balance). As to controls on outflows, there is Malaysia and there is everybody else. In Malaysia, controls reduced outflows and may have given room for more independent monetary policy (the other poster child does not fare as well, in that our results are not as conclusive as for the Chilean controls on inflows). Absent the Malaysian experience, there is little systematic evidence of success in imposing controls, however defined.

The paper proceeds as follows. The next section summarizes some of the key reasons why capital controls—particularly capital controls on inflows—are either considered or implemented. Controls, as we note, help deal with what we dub the “four fears.” Section 14.3 focuses on the distinctions among types of capital controls—highlighting the fact that not all capital control measures are created equal and therefore they cannot be simply lumped together in a rough capital controls index. Section 14.4 examines the existing empirical evidence by standardizing and sorting studies along a variety of criteria. Specifically, we focus on the following sorting strategy. First, we analyze separately cases where the study was multicountry or focused on a single case study; second, we distinguish the cases where the controls were primarily designed to deal with inflows or outflows; third, we provide an ad hoc (but uniform) criteria to rank the approach or econometric rigor applied in the study to test hypotheses about the effects of the controls; and, last, we evaluate the outcomes reported in the studies according to the definition of what constitutes a success. The last section discusses some of the policy implications of our findings.

14.2 The Rationale for Capital Controls and the “Four Fears”

Anyone examining the literature on capital controls, which spans many decades and all the regions around the globe, would be well advised to re-

tain a sense of irony. Repeatedly, policymakers have sought refuge in tax laws, supervisory restraint, and regulation of financial transactions to cope with external forces that they deem to be unacceptable. Often they rationalize their actions on loftier grounds, sometimes so effectively as to make it difficult to clearly identify episodes of controls on capital. But in all these episodes, four fears lurk beneath the surface.

14.2.1 Fear of Appreciation

Being the darling of investors in global financial centers has the decided, albeit often temporary, advantage of having ample access to funds at favorable cost. With the capital inflow comes upward pressure on the exchange value of the currency, rendering domestic manufacturers less competitive in global markets, and especially so relative to their close competitors who are not so favored as an investment vehicle. A desire to stem such an appreciation (which Calvo and Reinhart 2002 refer to as “fear of floating”) is typically manifested in the accumulation of foreign exchange reserves. Over time, though, sterilizing such reserve accumulation (the topic of Reinhart and Reinhart 1998) becomes more difficult, and more direct intervention more appealing.

14.2.2 Fear of “Hot Money”

For policymakers in developing countries, becoming the object of foreign investors’ attention is particularly troubling if such affection is viewed as fleeting. The sudden injection of funds into a small market can cause an initial dislocation that is mirrored by the strains associated with their sudden withdrawal. Such a distrust of “hot money” was behind James Tobin’s initial proposal to throw sand in the wheels of international finance, an idea that has been well received in at least some quarters. Simply put, a high enough tax (if effectively enforced) would dissuade the initial inflow and preempt the pain associated with the inevitable outflow.

14.2.3 Fear of Large Inflows

Policymakers in emerging market economies do not universally distrust the providers of foreign capital. Not all money is hot, but sometimes the sheer volume of flows matters. A large volume of capital inflows, particularly when it is sometimes indiscriminate in the search for higher yields (in the manner documented by Calvo, Leiderman, and Reinhart 1994), causes dislocations in the financial system. Foreign funds can fuel asset price bubbles and encourage excessive risk taking by cash-rich domestic intermediaries. Again, recourse to taxation may seem to yield a large benefit.

14.2.4 Fear of Loss of Monetary Autonomy

The interests of global investors and domestic policymakers need not always—or even often—align. But a trinity is always at work: it is not pos-

sible to have a fixed (or highly managed) exchange rate, monetary policy autonomy, and open capital markets (as discussed in Frankel 2001). If there is some attraction to retaining some element of monetary policy flexibility, something has to give. However, in the presence of the aforementioned fear of floating, giving up capital mobility may seem more attractive than surrendering monetary policy autonomy.

Whatever the reason for action, some forms of capital control were intended to control exchange rate pressures, stem large inflows, and regain an element of monetary autonomy. And this is more relevant for those policymakers who impose controls to reduce capital flight, because investors seeking safety—including, most important, domestic residents as well as foreigners—are seldom dissuaded by regulatory restraint.

14.3 What Do We Mean by Capital Controls?

In most of the empirical literature there are no distinctions between controls on outflows and controls on inflows; these exercises suffer from the same problems as the *de jure* International Monetary Fund (IMF) classification of exchange rate arrangements. Even when a distinction is made between inflows and outflows (as here), controls can and do range from the explicit to the subtle, from the market friendly to the coercive.¹

Furthermore, when considering the impacts and effectiveness of capital controls one cannot lump together the experiences of countries that have not substantially liberalized (e.g., India and China) with countries that actually went down the path of financial and capital account liberalization and decided at some point to reintroduce controls, as the latter have developed institutions and practices that are integrated in varying degrees to international capital markets.

Appendices D and E, which squarely focus on measures targeted to affect inflows and outflows in countries that had already gone the route of capital account liberalization,² indeed highlight the heterogeneity in both subtlety and market friendliness of capital control measures that have been tried in Asia, Europe, and Latin America during booms (these involve controls on capital inflows) as well as crashes (and attempts to curb capital outflows). These measures differ not only in subtlety and other features but also in intensity.³

1. There is, of course, the important issue of temporary versus permanent policies, a distinction not addressed here because most empirical studies do not focus on this issue. For a model and a discussion of the temporary-versus-permanent issue, see Reinhart and Smith (2002).

2. Hence, these cases involve the reintroduction of controls.

3. For a measure that quantifies the intensity of these measures see Montiel and Reinhart (1999).

14.4 The Empirical Literature: Finding a Common Ground

This section aims to overcome (or at least take a step in that direction) two of the apples-to-oranges problems we have identified in the capital controls literature. Namely, we attempt to (a) ascertain when and in what capacity capital controls were successful in achieving the stated objectives of the authorities (this is not trivial, as what constitutes as a success is defined very differently across studies), and (b) standardize (to some extent) the very eclectic array of descriptive and empirical methodologies and approaches that have characterized the empirical literature on capital controls. Lastly, we bring to bear evidence on episodes less familiar than the “classics” (Chile’s controls on inflows starting in 1990 and Malaysia’s 1998 controls on outflows).

In what follows, we review more than thirty papers that study capital controls on either inflows or outflows around the world. Some are country case studies, some describe several individual country experiences, and some are multicountry studies that bunch several cases together. As noted earlier, the papers measure “success” differently; thus, our aim is to standardize methodology and results where possible so as to facilitate comparisons. Not only will this enable us to assess the effectiveness of alternative capital controls events, but it will also permit us to evaluate some of the policy implications of imposing controls on capital inflows and/or outflows under alternative scenarios.

14.4.1 Types of Studies

We proceed as follows. First, we cluster the papers into three broad groups: capital inflows (CI), capital outflows (CO), and multicountry (MC)—the latter including the analysis of capital inflows, capital outflows, or both. We collected studies of capital controls for the following countries (the number of papers is shown in parentheses). For CI, there are studies on Brazil (6), Chile (11), Colombia (3), the Czech Republic (1), Malaysia (2), and Thailand (1). For CO, we obtained information for Malaysia (5), Spain (3), and Thailand (2). For the MC group, we collected five papers, covering a wide array of countries.⁴

14.4.2 Objective(s) of Capital Controls

Given the multiple objectives that capital controls are expected to achieve, we approached each paper with a series of questions. We asked whether, according to each paper, capital controls were able to

- Reduce the volume of capital flows
- Alter the composition of capital flows (toward longer-maturity flows)

4. For example, one of the more comprehensive multicountry papers uses monthly data for the period 1971–98 for a panel of twenty-six countries.

- Reduce real exchange rate pressures
- Allow for a more independent monetary policy

As a first step in sorting this information, we constructed tables 14.1–14.3. Table 14.1 includes CI episodes, table 14.2 displays CO episodes, and table 14.3 focuses on MC studies. As can be seen in the tables, possible answers are “yes,” “no,” and blank space. If the table reads “yes” in any cell, it means that the paper finds that the corresponding objective of capital controls was achieved. “No” stands for the paper finding that there was not such effect as a result of the capital controls. A blank space means that the paper does not address whether there was an effect. Sometimes the answer is followed by (ST). This indicates that the effects were only temporary—that is, that an objective was achieved only in the short term. To give an example, in table 14.1, the paper by Laurens and Cardoso (1998) studying the case of the Chilean experience during the 1990s finds evidence that capital controls were able to reduce the volume of capital flows only in the short term, that they were able to alter the composition of these flows toward longer-maturity flows, and that they were not successful in reducing pressures on the real exchange rate. They do not report results regarding the effectiveness of capital controls in making monetary policy more independent.

In a first pass through this information, by inspection, we can summarize it as follows (see table 14.4). We observe that in general the results obtained in these papers suggest that capital controls were successful in altering the composition of capital flows toward longer maturities and in making monetary policy more independent. However, the papers are not very informative regarding the effectiveness of capital controls in reducing the volume of capital flows and reducing real exchange rate pressures.

14.4.3 Indexes of Capital Control Effectiveness

But this is not informative enough, since it still lacks some rigor to evaluate the effectiveness of capital controls episodes. In order to better understand this, we construct two indexes of capital controls effectiveness. We call them the capital controls effectiveness index (CCE index) and the weighted capital controls effectiveness index (WCCE index). The only difference in computing them is that the WCCE index weighs the results obtained in each paper by the degree of methodological rigor applied to drawing conclusions; we discuss this further below.

In both cases, following the information summarized in tables 14.1–14.3, we arbitrarily assigned the following values:

- If the answer is yes, the corresponding value is 1.
- If the answer is no, the value assigned is -1 .
- If the question is not addressed at all, it corresponds to a value of 0.

Table 14.1

The famous Chilean case and lesser deities: Summary of key findings on effectiveness

Study	Sample	Did controls on outflows:			
		Reduce the volume of net capital outflows?	Alter the composition of flows?	Reduce real exchange rate pressures?	Make monetary policy more independent?
<i>A. Brazil</i>					
Cardoso and Goldfajn (1998)		Yes (ST)	Yes (ST)		
Edison and Reinhart (2001)	1994			No	No
Reinhart and Smith (1998)		Yes (ST)	Yes (ST)		
Ariyoshi et al. (2000)	1993–97	No	No	No	Yes (ST)
<i>B. Chile</i>					
De Gregorio, Edwards, and Valdés (2000)	1988:Q1–1998:Q2	Yes	Yes (ST)	Yes (ST)	Yes (ST)
Edwards (1999b)			Yes	No	Yes (ST)
Edwards (1999a)	June 1991–September 1998	No	Yes	No	Yes
Edwards and Rigobon (2004)	January 1991–September 1999			Yes	
Gallego, Hernández, and Schmidt-Hebbel (1999)		Yes (ST)	Yes (ST)	No	Yes
Labán and Larrain (1998)					
Larrain, Labán, and Chumacero (2000)	1985–94	No	Yes		
Laurens and Cardoso (1998)		Yes (ST)	Yes	No	
Le Fort and Budnevich (1997)	1990–94	No	Yes	Yes	Yes
Reinhart and Smith (1998)		Yes (ST)	Yes (ST)		
Valdés-Prieto and Soto (2000)	1987–95	No	Yes	No	No
Ariyoshi et al. (2000)	1991–98	No	No	No	Yes
<i>C. Colombia</i>					
Le Fort and Budnevich (1997)	1990–95	Yes (ST)	Yes	Yes	Yes
Reinhart and Smith (1998)		No	No		
Ariyoshi et al. (2000)	1993–98	No	No	No	Yes

(continued)

Table 14.1 (continued)

Study	Sample	Did controls on outflows:			
		Reduce the volume of net capital outflows?	Alter the composition of flows?	Reduce real exchange rate pressures?	Make monetary policy more independent?
<i>D. Czech Republic</i>					
Reinhart and Smith (1998)		No	Yes (ST)		
<i>E. Malaysia (1989)^a</i>					
Reinhart and Smith (1998)		Yes	Yes		
<i>F. Malaysia (1994)</i>					
Ariyoshi et al. (2000)	1994	Yes	Yes	Yes (ST)	Yes
<i>G. Thailand</i>					
Ariyoshi et al. (2000)	1995–97	Yes	Yes	Yes	Yes

Notes: A blank entry refers to the cases where the study in question did not analyze that particular relationship. (ST) refers to cases where only short-term effects were detected.

^aNote that there are several studies on Malaysia's 1998 capital controls targeting *outflows*. Here, we are referring to the controls on capital *inflows* introduced in January 1994.

These values are designed to equally weigh the existence or nonexistence of effects as a result of the imposition of capital controls and to give no weight to questions not addressed, so as not to distort the results in case any objective of capital controls is not addressed by the paper. With these values at hand, for each country we computed simple averages of these numbers for each of the four questions we brought to the papers. This gives, for example, a CCE index for volume reduction for each country, a CCE index for real exchange rate pressure reduction for each country, and so on. With this information we are able to compare, for each objective, which country was most effective. We also used this information to compute an aggregate index of capital controls effectiveness, by averaging out the four CCE indexes for each country, and then compiled a global CCE index across countries.

However, as has already been mentioned, the methodology used in these papers to evaluate success is highly heterogeneous. Some papers are mainly descriptive, generating conclusions from the movements (or lack thereof) in the time series of the main variables, and lack any rigorous statistical or econometric analysis. Other papers use some statistical or econometric methodology to evaluate capital control events, but among them there is still wide variation in the degree of rigor used to extract conclusions from the data.

In order to control for these differences, we made another pass through

Table 14.2 The famous Malaysian case and lesser deities: Summary of key findings on effectiveness

Study	Episode	Did controls on outflows:			
		Reduce the volume of net capital outflows?	Alter the composition of flows?	Reduce real exchange rate pressures?	Make monetary policy more independent?
<i>A. Malaysia</i>					
Tamirisia (2004)	January 1991–December 2002	Malaysia		No	Yes
Dornbusch (2001)				No	
Edison and Reinhart (2001)				Yes	Yes
Kaplan and Rodrik (2002)	1992–96				Yes
Ariyoshi et al. (2000)	1998–2000	Yes		Yes	Yes
<i>B. Spain</i>					
Viñals (1992)	1992	No			
Edison and Reinhart (2001)	1995–99			No	No
Ariyoshi et al. (2000)	1992	Yes		Yes (ST)	Yes
<i>C. Thailand</i>					
Edison and Reinhart (2001)				No	No
Ariyoshi et al. (2000)	1997–98	Yes		Yes	Yes (ST)

Notes: See table 14.1 notes.

the information in the papers. We classify each study according to the degree of methodological rigor—low, intermediate, or high—according to the following criteria. “Low” includes studies that consist mainly of descriptive analysis of events and/or time series. “Intermediate” includes papers that draw conclusions from a more formal evaluation of events but still lack any formal hypothesis testing. An example would be papers that perform time rescaling to compare the effects of capital controls in a before-and-after analysis. “High” includes only those studies that have highly developed econometric techniques, with well-defined hypothesis testing. Appendices A–C summarize the methodology used in each paper, as well as the corresponding classification as low, intermediate, or high, following these definitions.

In order to compute the WCCE index, we assigned the following values: low, 0.1; intermediate, 0.5; and high, 1. With these values at hand, we compute the WCCE index similarly to the CCE index, in order to determine

Table 14.3 The others—Multicountry studies: Summary of key findings on effectiveness

Study	Sample	Did controls on inflows:			
		Reduce the volume of net capital inflows?	Alter the composition of flows?	Reduce real exchange rate pressures?	Make monetary policy more independent?
Montiel and Reinhart (1999)	Indonesia, Malaysia, Philippines, Sri Lanka, Thailand, Argentina, Brazil, Chile, Colombia, Costa Rica, Mexico, Czech Republic, Egypt, Kenya, and Uganda (1990–96)	No	Yes (ST)		No
Reinhart and Smith (1998)	Brazil, Chile, Colombia, Czech Republic, Malaysia, Mexico, Thailand, Indonesia, and the Philippines	Yes (ST)	Yes (ST)		Yes
Kaplan and Rodrik (2002)	Korea, Thailand, Indonesia, Malaysia (monthly and quarterly data for 1992–96—before crisis—and from crisis time and one year ahead)			No	No
Edison and Reinhart (2001)	Spain (1991–93); Brazil, Malaysia, and Thailand (1995–99)				
Mimiane and Rogers (2004)	Control group: the Philippines and South Korea (daily data) Australia, Austria, Belgium, Canada, Chile, Colombia, Denmark, Finland, France, Germany, Greece, India, Italy, Japan, Korea, Malaysia, Mexico, the Netherlands, Norway, the Philippines, Portugal, South Africa, Spain, Sweden, Turkey, United Kingdom (monthly data for January 1971–December 1998)			Yes (ST)	No

Notes: See table 14.1 notes.

Table 14.4 Summary of results by country and multicountry studies

Study	Did controls on outflows:			
	Reduce the volume of net capital outflows?	Alter the composition of flows?	Reduce real exchange rate pressures?	Make monetary policy more independent?
Controls on inflows				
Brazil	Unclear	Unclear	No	Unclear
Chile	Unclear	Yes	Unclear	Yes
Colombia	Unclear	Unclear	Unclear	Yes
Czech Republic	No	Yes		
Malaysia (1989)	Yes	Yes		
Malaysia (1994)	Yes	Yes	Yes	Yes
Thailand	Yes	Yes	Yes	Yes
Controls on outflows				
Malaysia (1998)			Unclear	Yes
Spain	Unclear		Unclear	Unclear
Thailand	Yes		Yes	Yes
Multicountry studies	Yes	Yes	Yes	No
Complete sample	Unclear	Yes	Unclear	Yes

Note: Yes stands for yes, it worked; No for no, it did not work; Unclear for mixed results; and blanks for results not reported.

which country has been most effective in achieving each of the four objectives. We also compute an aggregate (per-country) WCCE index, which enables us to understand which countries capital controls were more useful in. Furthermore, given this information, we can, at least as a first approximation, find conditions under which capital controls tend to be effective. Once more, it is worth mentioning that these exercises were done separately for the three clusters into which we separated the papers: CI, CO, and MC.

14.4.4 Summary of Results

Summary results of the CCE and WCCE indexes are presented in tables 14.5–14.7. From these indexes, we can extract the following policy conclusions. Looking at the data on controls on inflows (table 14.5) along with the preliminary results in table 14.4, we see that capital controls were able to make monetary policy more independent, alter the composition of capital flows toward longer maturities, and reduce real exchange rate pressures (although the evidence on the latter is more controversial). Interestingly, the usual model economy for this type of controls, Chile, stands out as achieving these goals quite comfortably, as the WCCE index shows. In this regard, initial conditions or characteristics such as those in Chile in the early 1990s, along with the continuing reforms during the 1990s, appear to be

Table 14.5 **Capital inflows: The indexes**

Country	Index	Reduce the volume of net capital inflows	Alter the composition of flows	Reduce real exchange rate pressures	Make monetary policy independent	Country average
Brazil	CCE	0.00	0.00	-0.67	0.00	0
	WCCE	0.35	0.35	-0.275	-0.225	0.05
Chile	CCE	-0.09	0.64	-0.27	0.45	0.18
	WCCE	0.03	0.67	-0.27	0.29	0.18
Colombia	CCE	-0.33	-0.33	0.00	0.67	0.00
	WCCE	-0.17	-0.17	0.00	0.07	-0.07
Czech Republic	CCE	-1.00	1.00	0.00	0.00	0.00
	WCCE	-0.50	0.10	0.00	0.00	-0.10
Malaysia	CCE	1.00	1.00	0.50	0.50	0.75
	WCCE	0.30	0.30	0.05	0.05	0.18
Thailand	CCE	1.00	1.00	1.00	1.00	1.00
	WCCE	0.10	0.10	0.10	0.10	0.10

Source: Table 14.1 and sources cited therein.

Table 14.6 **Capital outflows: The indexes**

Country	Index	Reduce the volume of net capital inflows	Alter the composition of flows	Reduce real exchange rate pressures	Make monetary policy independent	Country average
Malaysia	CCE	0.20	0.00	0.00	0.80	0.25
	WCCE	0.02	0.00	0.00	0.62	0.16
Spain	CCE	0.50	0.00	0.50	0.50	0.38
	WCCE	0.05	0.00	0.20	0.20	0.11
Thailand	CCE	0.50	0.00	0.00	0.00	0.13
	WCCE	0.05	0.00	-0.50	-0.50	-0.24

Source: Table 14.2 and sources cited therein.

Table 14.7 **Multicountry studies: The indexes**

Index	Reduce the volume of net capital inflows	Alter the composition of flows	Reduce real exchange rate pressures	Make monetary policy more independent
CCE	0.00	0.40	0.00	-0.40
WCCE	-0.10	0.30	0.00	-0.40

Source: Table 14.1 and sources cited therein.

necessary in order for capital controls on inflows to be effective. On the other hand, capital controls on inflows were not very effective in reducing the volume of net flows (hence the impact of these flows on the current account balance).

Looking in more detail, we see that Malaysia (1994) stands out as the best performer in terms of reducing the volume of capital flows, Chile dominates regarding the change in capital flow maturity, Thailand is superior in reducing real exchange rate pressures, and Chile again dominates in regard to monetary policy independence. Overall, as the average of the WCCE index reflects, Chile emerges as the most successful example of capital controls on inflows.

Let us now focus on capital controls on outflows (table 4.6). The received wisdom is that Malaysia (1997) is the example to follow. From our results, we can see that these capital controls were effective in reducing capital outflows and in making monetary policy more independent. Yet the results from WCCE index are not as conclusive as those on the Chilean controls on inflows.

If we focus on reduction in capital flows, Thailand and Spain dominate Malaysia. Regarding a switch in capital flows toward longer maturity, no conclusion can be extracted. Spain emerges as the best in real exchange rate pressure reduction; on the other hand, Malaysia clearly dominates at making monetary policy more independent. On the aggregate, Malaysia appears to be the most successful in its experience of capital controls on outflows.

Some further comments are in order. First, it could be argued that these indexes are not taking into account many other variables that might be affecting the effectiveness of capital controls, especially the set of other reforms being put in place in each country during each capital controls episode. That is true. However, this paper is reviewing and assessing only the conclusions contained in previous papers, not the papers themselves. All the reviewed papers draw conclusions from their information sets, and we just put them together and try to extract the main message that these papers give as a group. Furthermore, it is precisely because of this omitted-variables bias problem that our WCCE index becomes more relevant. For example, any structural reform carried on in parallel with capital controls is not usually specifically reflected in the papers we review; in a sense, for us this is similar to running a regression with missing data that we have to control for. This is where the degree of methodological rigor becomes important. The more formal the analysis is, especially if it includes hypothesis testing, the more accurate the information contained in it.

Second, a similar reasoning applies to the endogeneity of capital controls. Some could argue that we should control for it. Again, we rely on the conclusions obtained in previous papers, thus giving more value to the results we obtain from WCCE index. Also, this is relevant for how controls

on capital inflows affect capital outflows. Moreover, that is why we cluster CI and CO separately in our analysis.

Third, it is worth mentioning that the papers we review are clearly not the only ones dealing with capital controls. There are many papers that analyze the long-run effects of capital controls, whereas we focus on the short run only, as can be seen from the questions with which we approach the papers. Other chapters in this book study the effects of capital controls on growth; we don't go into further details since these papers are out of our scope.

Fourth, another interesting point is whether capital control regimes are transitory or permanent. Here, as the questions we focus on clearly reveal, we are interested only in transitory events. This is why episodes such as the Chinese or Indian approach to capital controls are not covered here; see the papers on these countries contained in this volume for that purpose.

Fifth, an interesting point to raise is related to the timing (and related endogeneity) of capital controls: whether they are imposed in response to events—crises—or if they are designed in advance. Here, once more, we lack information because we rely only on what the papers conclude. It is worth mentioning, though, that by inspection it appears that the Malaysian (1997) episode could have been designed in advance, unlike most of the other episodes, and contrary to common wisdom. This theory emerges from the chronologies given in appendices D and E. In the case of Malaysia, a great quantity of controls was imposed on September 1, 1997. Furthermore, their level of detail seems to suggest that they were not decided upon and designed just in response to the crises.

Sixth, sometimes temporary capital control events become permanent. This could be because of time consistency problems or just because of the current response to future changes: rational expectations call for incorporating into your current decision the fact that in a prespecified time period capital controls will be levied. Furthermore, even if a country imposed capital controls and did levy them at the preestablished date, this might work as a signal that capital controls could be imposed in the future if needed. However, this signal says nothing about the controls being either good or bad—many things will influence the latter, especially the controls' effectiveness, as well as their effects on property rights. At any rate, imposing capital controls once establishes a precedent regarding a country's position toward capital mobility, despite the costs and benefits of such controls. This is another dimension in which temporary capital controls might become permanent.

14.5 Conclusions

In sum, capital controls on inflows seem to make monetary policy more independent, alter the composition of capital flows, and reduce real ex-

change rate pressures (although the evidence here is more controversial).⁵ Capital controls on inflows, however, seem not to reduce the volume of net flows (and, hence, the current account balance).

As for controls on capital outflows, there is Malaysia . . . and there is everybody else. In Malaysia, controls reduce outflows and may make room for more independent monetary policy.⁶ There is little evidence of success in other countries that attempt to control outflows, either by altering volume or by regaining monetary policy independence. These findings are in line with those of the earlier literature focused on capital flight (as in Mathieson and Rojas-Suarez 1996) and dual or parallel exchange markets (as in Kiguel, Lizondo, and O'Connell 1997).

While the effectiveness of controls varies across time, country, and type of measures used, limiting private external borrowing in the good times plays an important prudential role, because more often than not countries are debt intolerant. Indeed, often the critical problem in good times is that countries borrow too much!⁷

While our study has made the case for the need to distinguish measures primarily designed to discourage inflows from those that primarily aim at curbing outflows, it would be worthwhile for future research to attempt to ascertain whether there are also important differences in achieving success between measures that are more market friendly (as in the Chilean reserve requirements) versus those that are based on more blunt quantitative restrictions. Furthermore, in this study, owing to the nature of most of the empirical work reviewed here (which treats the control measures as single episodes), it would be interesting for policy purposes to examine differences between short-run and long-run impacts of the measures, to ascertain how quickly control measures lose their effectiveness.

As long as capital flows to emerging markets remain volatile and potentially disruptive, the discussion of capital controls in academic and policy circles will remain alive, and hence there is a real need to evaluate their effectiveness, however defined. As noted earlier, it is an old discussion. Tobin's seminal paper (Tobin 1978) dates back to the 1970s. Furthermore, capital controls have historically been used to deal with the fickle capital flow cycle for at least two hundred years. Indeed, as in past inflow episodes, at the time of this writing countries like Colombia and Argentina either have implemented controls on capital inflows or are contemplating doing so.

5. According to the WCCI, Chile stands out in achieving these goals.

6. Yet the results for Malaysia based on the WCCI are not as conclusive as those for the Chilean controls on inflows.

7. See Reinhart, Rogoff, and Savastano (2003) for details.

Appendix A

Table A.1 Capital Inflows: Methodology and Degree of Methodological Rigor

Study	Sample	Methodology	Econometric rigor
<i>A. Brazil</i>			
Cardoso and Goldfajn (1998)	January 1988–December 1995	OLS controlling for heteroscedasticity and serial correlation, IV, and VAR. The authors control for endogeneity of capital controls (government's reaction function).	High
Edison and Reinhart (2001)	1995–2001	Test for equality of moments and changes in persistence between capital controls and no controls, principal-components analysis; block exogeneity tests (VAR) for causality; GARCH for the effects of controls on volatility; and Wald tests for structural breaks over a rolling window.	High
Reinhart and Smith (1998)	1994–1996	Event comparison through time rescaling (labeling the implementation of controls as period t , and analyzing the evolution of the series in $t - 1$ through $t + 2$). Detailed chronological description of the various measures applied in each economy.	Medium
Ariyoshi et al. (2000)	1993–1997	Extensive descriptive and comparative country-studies analysis of time series in each episode, dividing facts according to controls on capital inflows (limiting short-term flows), controls on capital outflows (financial crises), extensive exchange controls (financial crises), long-standing controls and their liberalization, and rapid liberalization.	Low
<i>B. Chile</i>			
De Gregorio, Edwards, and Valdés (2000)	1988:Q1–1998:Q2	IV and VAR. With these, the authors address simultaneity problems, exogenous upward trend in capital flow, bias due to measurement error because of loopholes in controls. They consider two alternative measures of expected devaluations: (a) effective rate of depreciation, and (b) one-step-ahead forecast from a rolling ARMA. They consider two alternative measures of flows: (a) short-term flows to GDP, and (b) total flows to GDP.	High
Edwards (1999a)	June 1991–September 1998	Descriptive analysis of the composition of capital flows during capital control times. VAR on the effects of capital controls on the real exchange rate. GARCH for changes in the short-term central bank nominal interest rate and changes in the log of the stock market index.	High

Table A.1 (continued)

Study	Sample	Methodology	Econometric rigor
Edwards (1999b)	October 1994– January 1999	GARCH for changes in the short-term central bank nominal interest rate, and changes in the log of the stock market index, using daily data. Descriptive analysis of the effects of capital controls on the composition of capital inflows, on domestic interest rates, and on monetary policy independence.	High
Edwards and Rigobon (2004)	January 1991– September 1999	Using stochastic calculus, the authors compute the shadow exchange rate and its bands. GARCH (effect of capital controls on propagation of external shocks). Estimate a mean and a variance equation.	High
Gallego, Hernández, and Schmidt-Hebbel (1999)	1989–1998:Q2 and July 1998– June 1999	Least squares estimation, controlling for spurious correlation, endogeneity of the RHS regressors, heteroskedasticity, and autocorrelation. Cointegration analysis and error correction model. 2SLS estimation also included.	High
Labán and Larrain (1998)	1985–1996	Descriptive analysis of events, describing the context for implementing capital controls and the main macroeconomic effects.	Low
Larrain, Labán, and Chumacero (2000)	1985–1994	Estimation of a special case of nonlinear models in which a particular variable may adopt a certain law of motion conditional on an observation past a threshold (special case of Markov switching regime models, with the threshold replacing the transition matrix). The authors run a full-sample parsimonious regression for each series, to determine variables to include in the threshold process; for given choice of threshold variable, they estimate the model and get the p -value associated with a null of a unique stable representation; if the latter is rejected in favor of threshold process, the authors choose the threshold variable that minimizes the sum of squares of residuals, and reduce the threshold model to a parsimonious representation.	High
Laurens and Cardoso (1998)	1985:Q1– 1994:Q4	Linear and cubic approximations of net inflows as primary explanatory variables of interest rate differentials.	High
Le Fort and Budnevich (1997)	1990–1994	Descriptive analysis of events, describing the context for implementing capital controls and the main macroeconomic effects.	Low

(continued)

Table A.1 (continued)

Study	Sample	Methodology	Econometric rigor
Reinhart and Smith (1998)	1990–1994	Event comparison through time rescaling (labeling the implementation of controls as period t , and analyzing the evolution of the series in $t - 1$ through $t + 2$. Detailed chronological description of the various measures applied in each economy.	Medium
Valdés-Prieto and Soto (2000)	1987–1995	Error correction representation (that is efficient) with a two-step procedure: (a) OLS estimation of the real exchange rate on a set of explanatory variables to contrast the estimated residuals, and (b) using these residuals to estimate by OLS an error correction equation measuring the deviation of the dependent variable from its long-term equilibrium level (given by step [a]). The authors check for several endogeneity and simultaneity biases. They also look at the effect of controls on short-term credit.	High
		<i>C. Colombia</i>	
Le Fort and Budnevich (1997)	1990–1995	Descriptive analysis of events, describing the context for implementing capital controls and the main macroeconomic effects.	Low
Reinhart and Smith (1998)	1990–1995	Event comparison through time rescaling (labeling the implementation of controls as period t , and analyzing the evolution of the series in $t - 1$ through $t + 2$. Detailed chronological description of the various measures applied in each economy.	Medium
Ariyoshi et al. (2000)	1993–1998	Extensive descriptive and comparative country-studies analysis of time series in each episode, dividing facts according to controls on capital inflows (limiting short-term flows), controls on capital outflows (financial crises), extensive exchange controls (financial crises), long-standing controls and their liberalization, and rapid liberalization.	Low
		<i>D. Czech Republic</i>	
Reinhart and Smith (1998)	1994–1997	Event comparison through time rescaling (labeling the implementation of controls as period t , and analyzing the evolution of the series in $t - 1$ through $t + 2$. Detailed chronological description of the various measures applied in each economy.	Medium

Table A.1 (continued)

Study	Sample	Methodology	Econometric rigor
Reinhart and Smith (1998)	1993–1996	<i>E. Malaysia (1989)</i> Event comparison through time rescaling (labeling the implementation of controls as period t , and analyzing the evolution of the series in $t - 1$ through $t + 2$. Detailed chronological description of the various measures applied in each economy.	Medium
Ariyoshi et al. (2000)	1994	<i>F. Malaysia (1994)</i> Extensive descriptive and comparative country-studies analysis of time series in each episode, dividing facts according to controls on capital inflows (limiting short-term flows), controls on capital outflows (financial crises), extensive exchange controls (financial crises), long-standing controls and their liberalization, and rapid liberalization.	Low
Ariyoshi et al. (2000)	1995–1997	<i>G. Thailand</i> Extensive descriptive and comparative country-studies analysis of time series in each episode, dividing facts according to controls on capital inflows (limiting short-term flows), controls on capital outflows (financial crises), extensive exchange controls (financial crises), long-standing controls and their liberalization, and rapid liberalization.	Low

Notes: OLS = ordinary least squares; IV = instrumental variables; VAR = vector autoregression; GARCH = generalized autoregressive conditional heteroskedastic; ARMA = autoregressive moving average; 2SLS = two-stage least squares.

Appendix B

Table B.1 Capital Outflows: Methodology and Degree of Methodological Rigor

Study	Sample	Methodology	Econometric rigor
		<i>A. Malaysia</i>	
Tamirisia (2004)	January 1991– December 2002	Error correction model. Series on net foreign portfolio assets are by foreign portfolio assets to isolate country-specific effects.	High
Dornbusch (2001)		Descriptive analysis of different variables.	Low
Edison and Reinhart (2001)		Test for equality of moments and changes in persistence between capital controls and no controls, principal-components analysis; block exogeneity tests (VAR) for causality; GARCH for the effects of controls on volatility; and Wald tests for structural brakes over a rolling window.	High
Kaplan and Rodrik (2002)	1992–1996	Shifted difference-in-differences to separate the counterfactual of capital controls versus IMF program–based recovery. This methodology enables the authors to reschedule the episodes by the timing of the crises (shifted). The difference-in-differences allows them to capture the comparison effect of the recovery with capital controls vis-à-vis with a successful IMF program, controlling for exogenous and country-specific effects (static and dynamic).	High
Ariyoshi et al. (2000)	1998–2000	Extensive descriptive and comparative country-studies analysis of time series in each episode, dividing facts according to controls on capital inflows (limiting short-term flows), controls on capital outflows (financial crises), extensive exchange controls (financial crises), long-standing controls and their liberalization, and rapid liberalization.	Low
		<i>B. Spain</i>	
Viñals (1992)	1992	Descriptive analysis of economic policy measures and their effect on various macroeconomic variables.	Low
Edison and Reinhart (2001)	1991–1993	Test for equality of moments and changes in persistence between capital controls and no controls, principal-components analysis; block exogeneity tests (VAR) for causality; GARCH for the effects of controls on volatility; and Wald tests for structural brakes over a rolling window.	High

Table B.1 (continued)

Study	Sample	Methodology	Econometric rigor
Ariyoshi et al. (2000)	1992	Extensive descriptive and comparative country-studies analysis of time series in each episode, dividing facts according to controls on capital inflows (limiting short-term flows), controls on capital outflows (financial crises), extensive exchange controls (financial crises), long-standing controls and their liberalization, and rapid liberalization.	Low
Edison and Reinhart (2001)	1995–1999	<i>C. Thailand</i> Test for equality of moments and changes in persistence between capital controls and no controls, principal-components analysis; block exogeneity tests (VAR) for causality; GARCH for the effects of controls on volatility; and Wald tests for structural brakes over a rolling window.	High
Ariyoshi et al. (2000)	1997–1998	Extensive descriptive and comparative country-studies analysis of time series in each episode, dividing facts according to controls on capital inflows (limiting short-term flows), controls on capital outflows (financial crises), extensive exchange controls (financial crises), long-standing controls and their liberalization, and rapid liberalization.	Low

Appendix C

Table C.1 Multi-country Studies: Methodology and Degree of Methodological Rigor

Study	Sample	Methodology	Econometric rigor
Montiel and Reinhart (1999)	1990–1996	The authors construct indexes to measure incidence and intensity of capital account restrictions. Estimation of fixed-effect panel regressions to explain volume and composition of capital flows. Results are checked for robustness by IV estimations. Covers Indonesia, Malaysia, the Philippines, Sri Lanka, Thailand, Argentina, Brazil, Chile, Colombia, Costa Rica, Mexico, the Czech Republic, Egypt, Kenya, and Uganda.	High
Reinhart and Smith (1998)	1990–1997	Event comparison through time rescaling (labeling the implementation of controls as period t , and analyzing the evolution of the series in $t - 1$ through $t + 2$). Detailed chronological description of the various measures applied in each economy. Covers Brazil, Chile, Colombia, the Czech Republic, Malaysia, Mexico, Thailand, Indonesia, and the Philippines.	Intermediate
Kaplan and Rodrik (2002)	1992–1996	Shifted difference-in-differences to separate the counterfactual of capital controls versus IMF program-based recovery. This methodology enables the authors to reschedule the episodes by the timing of the crises (shifted). The difference-in-differences allows them to capture the comparison effect of the recovery with capital controls vis-à-vis with a successful IMF program, controlling for exogenous and country-specific effects (static and dynamic). Covers Korea, Thailand, Indonesia, Malaysia (monthly and quarterly data for 1992–96—before crisis—and from crisis time and one year after).	
Edison and Reinhart (2001)	1991–1999	Test for equality of moments and changes in persistence between capital controls and no controls, principal-components analysis; block exogeneity tests (VAR) for causality; GARCH for the effects of controls on volatility; and Wald tests for structural brakes over a rolling window. Covers 1991–93 for Spain and 1995–99 for Brazil, Malaysia, and Thailand. Control group: the Philippines and South Korea.	High

Table C.1 (continued)

Study	Sample	Methodology	Econometric rigor
Miniane and Rogers (2004)	January 1971–December 1998	Panel VAR and individual-country VAR of commodity prices, U.S. industrial production, U.S. consumer prices, foreign industrial production, foreign interest rates, U.S. Fed Funds rate, ratio of nonborrowed reserves to reserves, and nominal exchange rate in response to a 25 basis point increase in the Fed Funds rate. For the country-level VAR the authors regress each country separately, compute the cumulative exchange rate and interest rate responses, and finally regress country-specific responses on the values of capital control index, exchange rate regime, degree of dollarization, and trade integration. Covers Australia, Austria, Belgium, Canada, Chile, Colombia, Denmark, Finland, France, Germany, Greece, India, Italy, Japan, Korea, Malaysia, Mexico, the Netherlands, Norway, the Philippines, Portugal, South Africa, Spain, Sweden, Turkey, and the United Kingdom.	High

Appendix D

Restrictions on Inflows and Prudential Requirements

For each country, the date in parentheses denotes the first year of the surge in inflows. Sources for Asian countries are Alfiler (1994); Bank Indonesia annual report, various issues; Bank Negara annual report, various issues; and various Bank of Thailand reports. Sources for Eastern European and Latin American countries are Central Bank of Chile (1991, 1992), Banco de la Republica Colombia (1993, 1994); Banco de Mexico (1992); and Conselho Monetario Nacional Brasil (1994, 1995).

Asia

Indonesia (1990)

March 1991: The central bank adopts measures to discourage offshore borrowing. Bank Indonesia begins to scale down its swap operations by reducing individual banks' limits from 25 to 20 percent of capital. The three-month swap premium is raised by 5 percentage points.

October 1991: All state-related offshore commercial borrowing is made subject to prior approval by the Government and annual ceilings are set for new commitments over the next five years.

November 1991: Further measures are taken to discourage offshore borrowing. The limits on banks' net open market foreign exchange positions are tightened by placing a separate limit on off-balance sheet positions. Bank Indonesia also announces that future swap operations (except for "investment swaps" with maturities of more than two years) will be undertaken only at the initiative of Bank Indonesia.

Malaysia (1989)

June 1, 1992: Limits on non-trade-related swap transactions are imposed on commercial banks.

January 17, 1994–August 1994: Banks are subject to a ceiling on their non-trade- or non-investment-related external liabilities.

January 24, 1994–August 1994: Residents are prohibited from selling short-term monetary instruments to nonresidents.

February 2, 1994–August 1994: Commercial banks are required to place with Bank Negara the ringgit funds of foreign banking institutions (Vostro accounts) held in non-interest-bearing accounts. However, in the January-May period these accounts were considered part of the eligible liabilities base for the calculation of required reserves, resulting in a negative effective interest rate in Vostro balances.

February 23, 1994–August 1994: Commercial banks are not allowed to undertake non-trade-related swap and outright forward transactions on the bid side with foreign customers.

The Philippines (1992)

July 1994: The central bank begins to discourage forward cover arrangements with nonresident financial institutions.

Thailand (1988)

Banks' and finance companies' net foreign exchange positions may not exceed 20 percent of capital. Banks' and finance companies' net foreign liabilities may not exceed 20 percent of capital. Residents are not allowed to hold foreign currency deposits except for trade-related purposes.

April 1990: Banks' and finance companies' net foreign exchange position limit is raised to 25 percent of capital.

August 8, 1995: Reserve requirements, to be held in the form of non-interest-bearing deposits at the Bank of Thailand, on short-term non-resident baht accounts are raised from 2 percent to 7 percent. While reserve requirements on domestic deposits are also 7 percent, up to 5 percent can be held in the form of interest-bearing public bonds.

December 1995: The 7 percent reserve requirement is extended to finance companies' short-term (less than one year) promissory notes held by non-residents. A variety of measures aimed at reducing foreign-financed lending are introduced.

April 19, 1996: Offshore borrowing with maturities of less than one year by commercial banks, Bangkok International Banking Facility (BIBF) offices, finance companies, and finance and security companies will be subject to a 7 percent minimum reserve requirement in the form of a non-remunerated deposit with the Bank of Thailand. Loans for trade purposes will be exempt.

Eastern Europe and Latin America

Brazil (1992)

October 1994: A 1 percent tax on foreign investment in the stock market is imposed. The tax on Brazilian companies issuing bonds overseas is raised from 3 percent to 7 percent of the total. (These taxes are both eliminated on March 10, 1995.) The tax paid by foreigners on fixed-interest investments in Brazil is raised from 5 percent to 9 percent. (This is reduced to 5 percent on March 10, 1995.) The central bank raises limits on the amount of dollars that can be bought on foreign exchange markets.

Chile (1990)

June 1991: A nonremunerated 20 percent reserve requirement is to be deposited at the central bank for a period of one year on liabilities in foreign currency for direct borrowing by firms. The stamp tax of 1.2 percent a year (previously paid by domestic currency credits only) is applied to foreign loans as well. This requirement applies to all credits during the first year, with the exception of trade loans.

May 1992: The reserve requirement on liabilities in foreign currency for direct borrowing by firms is raised to 30 percent. Hence, all foreign currency liabilities have a common reserve requirement.

Colombia (1991)

June 1991: A 3 percent withholding tax is imposed on foreign exchange receipts from personal services rendered abroad and other transfers that could be claimed as credit against income tax liability.

February 1992: Banco de la Republica increases its commission on its cash purchases of foreign exchange from 1.5 percent to 5 percent.

June 1992: Regulation of the entry of foreign currency as payment for services is introduced.

September 1993: A nonremunerated 47 percent reserve requirement is to

be deposited at the central bank on liabilities in foreign currency for direct borrowing by firms. The reserve requirement is to be maintained for the duration of the loan and applies to all loans with a maturity of eighteen months or less, except for trade credit.

August 1994: A nonrenumerated reserve requirement is to be deposited at the central bank on liabilities in foreign currency for direct borrowing by firms. The reserve requirement is to be maintained for the duration of the loan and applies to all loans with a maturity of five years or less, except for trade credit with a maturity of four months or less. The percentage of the requirement declines as the maturity lengthens, from 140 percent for funds that are thirty days or less to 42.8 percent for five-year funds.

Colombia (2002)

December 2004: Foreigners investing in domestic markets must now keep their money in the country for at least one year.

Czech Republic (1992)

April 1995: The central bank introduces a fee of 0.25 percent on its foreign exchange transactions with banks, with the aim of discouraging short-term speculative flows.

August 1, 1995: A limit on net short-term (less than one year) foreign borrowing by banks is introduced. Each bank is to ensure that its net short-term liabilities to nonresidents, in all currencies, do not exceed the smaller of 30 percent of claims on nonresidents or 500 million Czech koruna. Administrative approval procedures seek to slow down short-term borrowing by nonbanks.

Mexico (1990)

April 1992: A regulation is passed that limits foreign currency liabilities of commercial banks to 10 percent of their total loan portfolio. Banks must place 15 percent of these liabilities in highly liquid instruments.

Appendix E

Restrictions on Outflows: Asia, Europe, and Latin America

For each country, the date in parentheses denotes the first year of the surge in outflows (or crisis). Sources are Banco de España; Bank Negara annual report, various issues; various Bank of Thailand reports; Conselho Monetário Nacional Brasil; and Dominquez and Tesar (chap. 7 in this volume).

Argentina (crisis ending the Convertibility Plan, 2001)

December 2001: The *Corralito* is established, limiting bank withdrawal limits and restrictions on dollar transfers and loans. However, purchases through checks or credit cards are available, and purchases of government bonds. December 30: suspension of external payments (debt default). In January 2002 there is a 40 percent devaluation, and a dual exchange rate regime is introduced (1.4 pesos per dollar for trade operations, with a floating regime for all other transactions). Later in the month, there is an easing of bank withdrawal restrictions, followed by an asymmetric pesofication: pesofication of dollar deposits at 1.4 pesos per dollar, with dollar debts pesofied at market exchange rate. There is unification of exchange rate regimes in a floating scheme; right to withdraw wages and pension incomes in full is granted; *Corralon* is imposed; there is a freeze of bank term deposits. In September of that year it is required that stocks should be traded in domestic currency regulation. Since the latter is widely resisted, it is eased, but the new restriction significantly increases transaction costs. In December 2002 the *Corralito* is rescinded.

Brazil (crisis ending the Real Plan, 1999)

March 1999: The government orders local investment funds to increase their holdings of government bonds. The central bank raises the minimum amount of sovereign debt that must be held in the country's foreign investment fund to 80 percent from 60 percent. This lowers the share that can be held in other countries' debt.

Malaysia (Asian crisis, 1997)

September 1998: Bank and foreign exchange controls limit offshore swap operations and ban short-selling. There is repatriation of ringgits held offshore, and strict regulation of offshore operations and most international operations in ringgits; export and import operations are allowed in foreign currency only; there is a twelve-month waiting period for nonresidents to sell profits from Malaysian securities; approval is required to invest abroad (above certain limits). In December residents are allowed to grant loans to nonresidents to purchase immovable property. In January 1999 some derivative transactions for nonresidents are permitted. In February there is a gradual ease on the twelve-month waiting period, and some repatriation funds are exempted from exit regulations. In March export and import trade ceilings are raised for operations with Thailand. In September commercial banks are allowed to enter into some short-term currency swaps with nonresident stockbrokers. In March 2000 funds from the sale of securities purchased by nonresidents can be repatriated without paying an exit levy; in June administrative

procedures ease classification of securities as being free from exit levy. September 30: Some offshore banks are allowed to invest in ringgit assets. December 1: Foreign-owned banks are allowed to increase domestic credit. In February 2001 the exit levy is abolished for some operations. In May of that year the remaining exit levy is abolished. In June all controls on nonresidents' futures and options are abolished. In July, resident financial institutions are allowed to extend ringgit loans to nonresidents investing in immovable property in Malaysia. In November 2002, resident banks' credit levels to finance nonresidents' projects in Malaysia are raised. December 3: The foreign currency limit for investment abroad by residents is abolished, and payments are liberalized to allow them to be in either ringgits or foreign currency.

Spain (ERM crisis, 1992)

September 1992: The Bank of Spain suspends regular money market operations and introduces foreign exchange controls. In October of that year the peseta is devalued, and some of the controls are lifted. In November the remaining foreign exchange controls are rescinded.

Thailand (Asian crisis, 1997)

May 1997: The Bank of Thailand (BOT) introduces restrictions on capital account transactions. In June the BOT introduces additional measures to limit capital flows. Baht proceeds from sales of stocks are required to be converted at the onshore exchange rate. Additional controls are introduced, and later in the month a two-tier exchange rate is introduced. In September of that year, additional controls on invisible and current account transactions are introduced. In January 1998 it is required that proceeds on exports and invisible transactions and current account transfers be surrendered after seven days (instead of fifteen days). At the end of January, the BOT ends the two-tier exchange rate regime.

References

- Alfilar, F. Enrico. 1994. Monetary and exchange rate policy responses to surges in capital flows: The case of the Philippines. Paper presented at the eleventh Pacific Basin Central Bank Conference. 31 October–2 November, Hong Kong.
- Ariyoshi, Akira, Karl Habermeier, Bernard Laurens, Inci Okter-Robe, Jorge Canales-Kriljenko, and Anderi Kirilenko. 2000. Capital controls: Country experiences with their use and liberalization. IMF Occasional Paper no. 190. Washington, DC: International Monetary Fund.
- Calvo, Guillermo A., Leonardo Leiderman, and Carmen M. Reinhart. 1994. The capital inflows problem: Concepts and issues. *Contemporary Economic Policy* 11 (3): 54–66.

- Calvo, Guillermo A., and Carmen M. Reinhart. 2002. Fear of floating. *Quarterly Journal of Economics* 117 (2): 379–408.
- Cardoso, Eliana, and Ilan Goldfajn. 1998. Capital flows to Brazil: The endogeneity of capital controls. *IMF Staff Papers* 45 (March): 161–202.
- De Gregorio, José, Sebastian Edwards, and Rodrigo Valdés. 2000. Controls on capital inflows: Do they work? *Journal of Development Economics* 3 (1): 59–83.
- Dornbusch, Rudi. 2001. Malaysia: Was it different? NBER Working Paper no. 8325. Cambridge, MA: National Bureau of Economic Research, June.
- Edwards, Sebastian. 1999a. How effective are capital controls? *Journal of Economic Perspectives* 13 (4): 65–84.
- . 1999b. How effective are controls on capital inflows? An evaluation of Chile's experience. University of California, Los Angeles, Anderson Graduate School of Management. Working Paper, June.
- Edwards, Sebastian, and Roberto Rigobon. 2004. Capital controls, managed exchange rates, and external vulnerability. University of California, Los Angeles, Anderson Graduate School of Management, and Massachusetts Institute of Technology, Sloan School of Management. Working Paper, February.
- Edison, Hali, and Carmen Reinhart. 2001. Stopping hot money: On the use of capital controls during financial crises. *Journal of Development Economics* 66 (2): 533–53.
- Gallego, Francisco, Leonardo Hernandez, and Klaus Schmidt-Hebbel. 1999. Capital controls in Chile: Effective? Efficient? Central Bank of Chile Working Paper no. 59. Santiago: Central Bank of Chile.
- Kaplan, Ethan, and Dani Rodrik. 2002. Did the Malaysian capital controls work? In *Preventing currency crises in emerging markets*, ed. S. Edwards and J. Frankel, 393–440. Chicago: University of Chicago Press.
- Kiguel, M., J. Saul Lizondo, and Stephen O'Connell, eds. 1997. *Parallel exchange rates in developing countries*. London: Macmillan.
- Labán, Raúl M., and Felipe Larrain. 1998. The return of private capital to Chile in the 1990s: Causes, effects, and policy reactions. Faculty Research Working Paper no. R98-02. Harvard University, John F. Kennedy School of Government, January.
- Larrain, Felipe, Raúl Labán, and Rómulo Chumacero. 2000. What determines capital inflows? An empirical analysis for Chile. Chap. 4 in *Capital controls, capital flows, and currency crises*, ed. F. Larrain. Ann Arbor: University of Michigan Press.
- Laurens, Bernard, and Jaime Cardoso. 1998. Managing capital flows: Lessons from the experience of Chile. IMF Working Paper no. 98. Washington, DC: International Monetary Fund.
- Le Fort, Guillermo, and Carlos Budnevich. 1997. Capital account regulations and macroeconomic policy: Two Latin experiences. Santiago: Central Bank of Chile. Mimeograph, March.
- Mathieson, Donald J., and Liliana Rojas-Suarez. 1996. Liberalization of the capital account: Experiences and issues. IMF Occasional Paper no. 103. Washington, DC: International Monetary Fund.
- Miniane, Jacques, and John Rogers. 2004. Capital controls and the international transmission of U.S. money shocks. Washington, DC: Board of Governors of the Federal Reserve. Mimeograph, June.
- Montiel, Peter, and Carmen M. Reinhart. 1999. Do capital controls and macroeconomic policies influence the volume and composition of capital flows? Evidence from the 1990s. *Journal of International Money and Finance* 18 (4): 619–35.
- Reinhart, Carmen, and Vincent R. Reinhart. 1998. Some lessons for policy makers

- who deal with the mixed blessing of capital inflows. In *Capital flows and financial crises*, ed. Miles Kahler, 93–127. Ithaca, NY: Cornell University Press.
- Reinhart, Carmen, Kenneth Rogoff, and Miguel Savastano. 2003. Debt intolerance. *Brookings Papers on Economic Activity*, Issue no. 1:1–74.
- Reinhart, Carmen, and Todd Smith. 1998. Too much of a good thing: The macroeconomic effects of taxing capital inflows. In *Managing capital flows and exchange rates: Perspectives from the Pacific Basin*, ed. Reuven Glick, 436–64. Cambridge: Cambridge University Press.
- . 2002. Temporary controls on capital inflows. *Journal of International Economics* 57 (2): 327–51.
- Tamirisia, Natalia. 2004. Do macroeconomic effects of capital controls vary by their type? Evidence from Malaysia. IMF Working Paper no. 04/3. Washington, DC: International Monetary Fund, January.
- Tobin, James. 1978. A proposal for international monetary reform. *Eastern Economic Journal* 4:153–59.
- Valdés-Prieto, Salvador, and Marcelo Soto. 2000. New selective capital controls in Chile: Are they effective? Chap. 3 in *Capital controls, capital flows, and currency crises*, ed. F. Larrain. Ann Arbor: University of Michigan Press.
- Viñals, José. 1992. Spain's capital account shock. Center for Economic Policy Research.