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# Capital Controls and the Global Financial Crisis

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February 2011

**WORKING**PAPER SERIES

Number 250

POLITICAL ECONOMY RESEARCH INSTITUTE

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# Regaining Control?
# Capital Controls and the Global Financial Crisis

Kevin P. Gallagher[1]

## Abstract

The global financial crisis has triggered a transformation in thinking and practice regarding the role of government in managing international capital flows. This paper traces and evaluates the re-emergence of capital controls as legitimate tools to promote financial stability. Whereas capital controls were seen as "orthodox" by the framers of the Bretton Woods system, they were shunned during the neo-liberal era that began in the late 1970s. There is now an emerging consensus that capital controls can play a legitimate role in promoting financial stability. From 2009 to early 2011 a number of developing nations resorted to capital controls to halt the appreciation of their currencies, and to pursue independent monetary policies to cool asset bubbles and inflation. A preliminary analysis of the effectiveness of these controls is conducted for the cases of Brazil, South Korea, and Taiwan. This preliminary analysis suggests that Brazil and Taiwan have been relatively successful in deploying controls, though South Korea's success has been more modest. The fact that capital controls continue to yield positive results is truly remarkable given the fact that there has been little (or contrary) support for global coordination, and that many nations lack the necessary institutions for effective policies. The paper concludes by pointing to the need for more concerted global and national efforts to manage global capital flows for stability and growth.

## I. Introduction

A key characteristic of the global financial crisis has been the mass swings of capital flows across the globe. Indeed, international investment positions now surpass global output. Developing and emerging markets were no strangers to these flows. When the crisis hit, capital rapidly left the developing world in a flight to the "safety" of the United States market. In the attempt to recover, many industrialized nations, including the U.S., have resorted to loose monetary policy with characteristically low interest rates. Relatively higher interest rates and a stronger recovery have triggered yet another surge in capital flows to the developing world. The result has been an increasing concern over currency appreciation, asset bubbles, and even inflation.

In a marked difference from previous crises, to tame excessive capital flows many emerging markets have deployed capital controls. To John Maynard Keynes, Harry Dexter White and the other architects of the Bretton Woods system, capital controls were

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seen as an essential feature of a well functioning global financial system. Beginning in the 1980s however, capital controls became shunned by the international financial institutions, the private sector, and many Western governments. During the Global Financial Crisis (GFC) capital controls have regained their legitimacy in academic circles and in actual policy.

This paper will examine the role that capital flows have played in the global financial crisis, trace the political economy of capital controls from the Bretton Woods era to their resurgence during the financial crisis, and conduct a preliminary analysis to evaluate the effectiveness of the controls thus far deployed. Finally, the paper will sketch the challenges of managing global capital flows in the 21st Century.

Beyond this short introduction, this paper has four additional parts. The second part of the paper traces the rise, fall, and resurgence in thinking about capital controls since Bretton Woods. Part three outlines the specific use of capital controls by various governments during the global financial crisis. In part four is a preliminary analysis of the effectiveness of those controls. Part five examines the challenges in terms of designing effective capital controls at the national and global level.

## II. Great (and not so great) Transformations

During the Bretton Woods process that established a fixed but adjustable pegged exchange rate system, the International Monetary Fund (IMF), and the World Bank, Britain's chief negotiator John Maynard Keynes and his US counterpart Harry Dexter White both agreed that a distinction should be made between "speculative" capital and "productive" capital, and that speculative "hot money" capital was to be scrutinized (Abdelal, 2007). Indeed, at those meetings Keynes argued that, "control of capital movements, both inward and outward, should be a permanent feature of the post-war system." (quoted from Helleiner, 1994, p33). Capital controls (on capital account transactions) were made fully permissible under the Articles of the International Monetary Fund and remain so, despite efforts to the contrary, to this day. As Keynes said, "What used to be a heresy is now endorsed as orthodoxy." (Helleiner, 1994, 25).

From the late 1970s until the global financial crisis, thinking about capital controls was drastically revised, with neo-liberal ideas about politics and economic organization dominating thinking about capital movements. In the wake of the global financial crisis there are a variety of perspectives on capital controls. This section of the paper traces these swings in thinking and practice over the last 70 years. The parts that follow are organized around Table 1.

Table 1

**Poltical Economy of Capital Controls**

| | ***Bretton Woods*** | ***1970s to 2000*** | ***Global Financial Crisis*** |
|---|---|---|---|
| ***Idea of government*** | Embedded liberalism | Neoliberal | Varietes of liberalism |
| ***Economic Thinking*** | Imposible trinity | Neoclassical | Macroprudential management |
| ***Geopolitical concerns*** | US lax on capital controls<br>IMF supportive | US against capital controls<br>IMF lukewarm | US mixed approval<br>IMF supportive |
| ***Past Lessons*** | 1945-1947 | Euromarket 1970s | Asian Financial Crisis<br>Global Financial Crisis |

*Sources: Helleiner, 1994; Cohen, 2008; Chwieroth, 2010; Abdelal, 2009; Eichengreen, 2007; Wade, 1998; and author*

## *Bretton Woods*

Previous to the construction of the Bretton Woods system, the world economy was hinged by the gold-exchange standard. All that changed with the establishment of Bretton Woods, formalized immediately after World War II. Barry Eichengreen describes as three significant changes in global monetary policy from Bretton Woods: pegged exchange rates became adjustable, capital controls were permitted to limit capital flows, and the International Monetary Fund (IMF) was established to monitor the global economy and provide balance-of-payment financing for countries in need (Eichengreen, 2007).

Eric Helleiner convincingly argues that this decisive change was due to four political-economic factors. These are depicted in the first column of Table 1 under "Bretton Woods." First, the construction of the Bretton Woods system reflected the prevailing mode of thought (at least in the UK and U.S. where the institutions were framed) of 'embedded liberalism'—the dominant thinking about political and economic organization at the time that stressed that markets were imperative but they needed to be 'embedded' in proper institutions for them to be welfare enhancing. "Embedded liberals argued that capital controls were necessary to prevent the policy autonomy of the new and interventionist welfare state from being undermined by speculative and disequilibrating international capital flows (Helleiner, 1994, 4). Helleiner stressed that this thinking was backed by a coalition of Keynesian-minded policy-makers, industrialists who gained from such policy, and labor leaders. In more recent work Helleiner stresses how Harry Dexter White and John Maynard Keynes wanted to formalize this way of thinking about states and markets in the Bretton Woods agreements. Indeed, they "saw the goal of brining international finance under greater public control as a central objective of their blueprints" (Helleiner, 2011, 2).

Second, professional economists at the time shared the view that on open trading system was not fully compatible with an open financial system, especially in a regime of fixed exchange rates. This notion later became formalized in the 1960s as the "impossible trinity" that argued that a fixed exchange rate and independent monetary policy were not compatible without a system of capital controls (Eichengreen, 2007).

Third, Helleiner argues that the U.S. remained permissive regarding capital controls, leaving policy space for nations to deploy them. The U.S. at the time endorsed an embedded liberal framework, and economists in the country also had concerns about the impossible trinity. Perhaps more importantly however, the U.S. permitted capital controls in other nations because of cold war concerns. Policy-makers in Japan and Europe saw controls as essential to their growth strategies and the U.S. saw enabling growth and maintaining alliances with those nations as a high priority.

Finally, according to Helleiner, was the spectre of 1945-7 when the U.S. pushed hard for capital account liberalization. This in part was seen as leading to the 1947 economic crisis in Europe. Immediately after Bretton Woods went into force the Roosevelt administration was replaced by Truman's and led to some significant changes in policy. Truman brought in members of the New York banking sector who sought to gain more access in Europe and elsewhere for capital flows. The backfire put the U.S. back on a course that was more accepting of controls until the 1970s.

A number of criticisms have been levied toward the Bretton Woods system. However, for at least two decades after the agreements were signed the system worked fairly well—though in large part because they were embedded in a broader institutional framework. To quote Eichengreen:

> Capital controls were the one element that functioned more or less as planned. Observers today, their impressions colored by the highly articulated financial markets of the late-twentieth century, are skeptical of the enforcement of such measures. But circumstances were different in the quarter-century- after World War II. This was a period when governments intervened extensively in their economies and financial systems. Interest rates were capped. The assets in which banks could invest were restricted. Governments regulated financial markets to channel credit toward strategic sectors. The need to obtain import licenses complicated efforts to channel capital transactions through the current account. Controls head back the flood because they were not just one rock in a swiftly flowing stream. They were part of the series of levees and locks with which the raging rapids were tamed (Eichengreen, 2007, 92).

In later years it would come as a shock that an international agreement, let alone the articles establishing the IMF, unambiguously sanctioned capital controls. The coalition described by Eichengreen others, along with its insistence of capital controls as an essential part of the global financial system, began to deteriorate in the 1970s.

*The Neo-liberal Era*

Enter the neo-liberal era, rising with the arrival of Ronald Reagan and Margaret Thatcher in 1979-80 and cresting with the 'Washington Consensus' advocated by the US, Europe and the IFIs throughout the 1990s. In general, this era could be characterized as seeing an extremely limited role for the state in economic affairs, and the principal role of politics was to carry out that economic view. Corresponding with Table 1, this period is characterized as a shift from embedded liberalism to neoliberal thought in general, and the dominance of a particular brand of neo-classical economics that supported a very limited role of the state in economic affairs in particular. In addition, whereas the US and IMF had seen it as advantageous to support capital controls in the earlier era, with the Cold War no longer driving US financial strategy, the US was now gaining a comparative advantage in global financial services and saw capital account liberalization as advantageous to key constituencies in the U.S. The very lucrative Euromarket, in hindsight, had served as a pilot project to show just how beneficial open capital markets could be for US financial services industries.

Perhaps Mark Blyth's analysis of the rise of neo-liberalism is most lucent. Blyth's book, Great Transformations: Economic Ideas and Institutional Change in the Twentieth Century (2002) traces the shift from embedded liberalism to neo-liberalism in the 1970s. He writes:

> In sum, just as labor and the state reacted to the collapse of the classical liberal order during the 1930s and 1940s by re-embedding the market, so business reacted against this embedded liberal order during the 1970s and 1980s and sought to "disembed liberalism" once again. In this effort, business and its political allies were quite successful, and by the 1990s a new neoliberal institutional order had been established in many advanced capitalist states with remarkable similarities to the regime discredited in the 1930s (Blyth, 2002, 6).

What makes Blyth's analysis so insightful is that he shows how such a key role was played by the political uses of economic ideas by organized business. In significant detail, Blyth shows how the U.S. business community, which in many ways earned its wings under the embedded liberal era, now sought to fly away from regulation, and from the U.S. In addition to setting up officices in Washington DC and creating political action committees Blyth traces how business funded think tanks to promote the neo-liberal ideas. Together these efforts managed to almost completely erode the compact Helliener discusses as uniting US economic politics and the international institutions that the US helped formed.

During this period came a rise in neo-classical economics in general and monetarist macro-economic thinking in particular. Milton Friedman's rival (to Keynesian) explanation of the causes of financial crises gave rise to a host of theoretical developments and corresponding policy recommendations that fed perfectly into the new

regime described by Blyth. One such case were developments in neo-classical economic theory that saw capital account liberalization as beneficial. Drawing on the "law of variable proportions", advocates for capital market liberalization argued that, by liberalizing the flows of international capital, developing countries would benefit by getting access to cheaper credit and investment from developed markets, promoting growth and stability. Because poorer nations have less capital per worker, the law of variable proportions states that the real return on capital would be higher in the industrialized countries where capital is relatively more scarce. This new capital would deepen credit markets, diversify availability of credit (and thus reduce risk), and so forth. Indeed, conventional theory implied that investment tends to flow to developing countries, where the marginal returns may be higher (Barro 1997).

US strategy changed as well. Whereas the Cold War drove US financial interests in this regard in the aftermath of the Bretton Woods agreements, the 1980s saw the emergence of U.S. financial services firms as major global players. The U.S., or New York in particular, was determined to become the world's global financial capital. Cohen (2007) attributes the US stance as a combination of ideology and domestic politics. Regardless of the party in power in the US, Treasury officials and Presidential advisors largely held neo-liberal training and beliefs beginning in the 1980s. Perhaps more importantly, Cohen illustrates that while the costs of capital controls are directly felt by a handful of politically organized US constituents—Wall Street—the beneficiaries are diffuse and don't feel the direct effects. Thus a collective action problem persisted where Wall Street organizes around capital account liberalization. Voices as diverse as Robert Wade (98) and Jagdish Bhagwati(98) went on to term a "Wall Street-Treasury complex" (analogous to the "military industrial complex coined during the Eisenhower era to describe politics of that time). These authors argued that the US Treasury and Wall Street investment houses pushed for the freedom of capital movements wherever possible, including forcing the IMF into pushing capital account liberalization worldwide and working to mint such a policy in the IMF articles.

It is true that the U.S. and the IMF were staunch advocates of capital account liberalization during this period. In the case of the IMF however, some authors of argued that IMF behavior was driven by more than just U.S. pressure and veto power. Abdelal, (2007) argues that this change was imported to the IMF from the French. French socialists were originally big advocates of capital controls. However, controls on outflows in 1983 adversely affected the middle class and led to a change in the party stance. When Michel Camdessus (a prominent French Socialist at the time) became IMF Managing Director he began changing the culture at the IMF toward the liberalization of capital controls.

Chwieroth (2010) acknowledges that the French connection was important, but stresses how the agents—the IMF staff—where the key advocates that had the most influence on the change. In its early days, most IMF staff were Keynesians who supported capital controls, but slowly the IMF became populated with US-trained neo-classical economists who believed capital controls to be counter-productive. Chwieroth finds however that there were tensions between "gradualist" and "big-bang" camps at the Fund. Gradualists

advocated for gradual capital account liberalization and the selective use of capital controls and big bang advocates wanted rapid liberalization of the capital account. The IMF is largely seen as a big bang advocate, especially to casual observers who saw the IMF looking to change its charter to mandate capital account liberalization and those who observed IMF country programs where capital controls often had to be eliminated on condition of an IMF loan. Chwieroth shows that this wasn't necessarily the case. Gradualists and big bang advocates at the IMF struck a compromise on capital controls controls. By the end of the 1990s the IMF was pushing for capital account liberalization but tacitly supporting limited and temporary controls as safeguard measures in crisis mitigation on the road to liberalization.

If the example of the adverse affects of attempted capital account liberalization between 1945-47 were the reason why the U.S. and IFIs backed off from prohibiting capital controls during the Bretton Woods era, the lucrativeness of the Euromarket in the 1970s was a pilot project pointing to the need to accelerate financial globalization—from a U.S. standpoint at least. In part to circumvent U.S. controls on outflows in the 1960s, U.S. banks fled to the Eurodollar market—the 'offshore' market where US dollars can be used to invest in Europe. New York banking firms lobbied hard to ensure that foreign currency loans of foreign branches of U.S. banks were exempt from the capital controls, as were offshore dollar loans (Helleiner, 1994). The entry into the Eurodollar market by US banks and multinational corporations not only became lucrative for individual firms, but also "Transformed the Eurodollar market from a short-term money market into a full-fledged international capital market." (Helleiner, 1994, 89). U.S. firms saw this example as something that should be imported home to secure the U.S. as a capitol for global finance.

*Global Financial Crisis*

It is clearly too early to provide a full characterization of thinking about capital controls during the wake of the financial crisis, as it is still in flux. This section therefore discusses what the present *is not* relative to the previous two periods rather that what *is*. It is true that the ideas surrounding neo-liberal political economic organization and neo-classical interpretations of capital flows have come under great scrutiny given the central role that both played in the crisis. However, the political forces that played such a strong role in transforming into the neo-liberal era are still intact and regaining political and economic strength. Nevertheless, numerous countries have deployed capital controls in the run up to and in the wake of the crisis, including Brazil, Colombia, Indonesia, South Korea, Taiwan, Thailand, and others. Moreover, the G-20 and IMF have proposed creating a new global regime to regulate capital flows.

Corresponding to Table 1, this section of the paper argues that there are now a variety of liberalisms that have political weight in the global economy; that there is new thinking in economics regarding capital controls, not the least of which is empirical evidence from neo-classical economists themselves on the efficacy of controls; that the U.S. has softened its stance capital controls and has less standing on the issue than before; and of

course that the global financial crisis, and the Asian crisis before it, loom large in terms of capital flows.

First, there are now a variety of models of liberalism that have gained dominance and that may pose an alternative to the U.S. brand of neo-liberalism. The most obvious examples are China, along with India and Brazil. These three emerging markets have had remarkably strong economic growth rates for a decade and after a temporary shock have been able to recover from the crisis more robustly, at least for now. These countries, to varying degrees could be classified as 'neo-developmental states'. The developmental state is the variant of embedded liberalism for developing countries, whereby developing country states embedded markets in a national drive toward industrialization and higher standards of living (Woo-Cummings, 1999). All three of these nations have been reluctant to liberalize their capital accounts and frequently (or permanently in China's case) deploy capital controls. These nations are now key parts of the G-20, have more voting rights at the International Monetary Fund, and so forth. They thus present a variant of liberalism that is somewhat balancing the view of capital account regulation and capital flows in the development process.

In economics, there has been less of a pluralization in thinking than there has been the need to confront the overwhelming evidence presented by neo-classical economists themselves on capital account liberalization and capital controls. The East Asian financial crisis and the economics literature put an end to discussions of changing the IMF's articles of agreement to include capital account liberalization. The Asian crisis was seen by many to be in large part due to too rapid of a liberalization of Asian capital accounts. Moreover, open capital accounts allowed the crisis to spread deeper and wider. At the same time, numerous economic studies including the IMF's own World Economic Outlook began to show that capital account liberalization was not associated with economic growth (Eichengreen, 2004, IMF, 2005; Ocampo and Stiglitz, 2008).

There is a near consensus among empirical neo-classical macroeconomists that capital market liberalization in developing countries is not associated with economic growth (Prasad et al. 2003). Indeed, the most recent research has shown that capital market liberalization is only associated with growth in nations that have reached a certain institutional threshold—a threshold that most developing nations are yet to achieve (Kose, Prasad, and Taylor 2009). This is partly due to the fact that the binding constraint for some developing country growth trajectories is not the need for external investment, but the lack of investment demand. This constraint can be accentuated through foreign capital flows because such flows appreciate the real exchange rate thus reducing the competitiveness of real economy goods and reducing private sector willingness to invest (Rodrik and Subramanian 2009).

Capital controls have been found to stabilize short-term volatile capital flows; and can give policymakers additional policy instruments that allow them more effective and less costly macroeconomic stabilization measures; can promote growth and increase economic efficiency by reducing the volatility of financing and of real macroeconomic performance; and can discourage long-term capital outflows (Ostry et al. 2010). The

literature on capital controls generally discusses at least six core reasons why nations may want to deploy them Magud and Reinhart (2006). To summarize, say Magud and Reinhart, "in sum, capital controls on inflows seem to make monetary policy more independent, alter the composition of capital flows and reduce real exchange rate pressures." In terms of outflows, say Magud and Reinhart, it is clear that such provisions were successful in Malaysia, but it is not so clear about the case of other nations.

In a February 2010 Staff Position Note, the IMF staff reviewed all the evidence on capital controls on inflows, pre and post crisis and concluded: “capital controls—in addition to both prudential and macroeconomic policy—is justified as part of the policy toolkit to manage inflows. Such controls, moreover, can retain potency even if investors devise strategies to bypass them, provided such strategies are more costly than the expected return from the transaction: the cost of circumvention strategies acts as “sand in the wheels” (Ostry et al, 2010). To come to this conclusion, this recent and landmark IMF study reviews the experiences of post-Asian crisis capital controls. The IMF also conducted its own cross-country analysis in this study, which also has profound findings. The econometric analysis conducted by the IMF examined how countries that used capital controls fared versus countries that did not use them in the run-up to the current crisis. They found that countries with controls fared better: “the use of capital controls was associated with avoiding some of the worst growth outcomes associated with financial fragility” during the global financial crisis (Ostry et al, 2010: 19).

The IMF’s stance on capital controls has gone beyond research. In addition to the staff position note the IMF has reiterated its support for the careful use of capital controls in its Global Financial Stability Report and in its flagship World Economic Outlook. In the wake of the crisis the IMF has recommended that nations such as Brazil, Colombia, and India deploy capital controls. Such advice has also been put forth by the Asian Development Bank, the United Nations, and even by the World Bank (Grabel, 2010).

Advice has not been limited to inflows controls. There has even been some attention by prominent economists on the need for restrictions on outflows. And the IMF began to endorse controls on outflows in its country programs. Calvo (2009) argues that capital controls could be deployed to dampen the impact of capital flight during crises. Even in “normal” times however, Calvo argues that prudential regulations should sometimes be coupled with foreign exchange restrictions to reduce capital flight. Indeed, during the global financial crisis the IMF actually recommended or at least sanctioned controls on outflows in Iceland, Latvia, and the Ukraine (Grabel, 2010; IMF, 2009).

What explains this shift in thinking, especially at the IMF? Part of the answer relies in the emerging plurality of the global system. As noted earlier, China, India, Brazil and other nations are now part of the G-20 (which has played the key role in the crisis rather than the G-7), have more voting power at the IMF and World Bank, and generally more sway given their market power and dynamism. Many of these nations deploy controls and see them as part of preserving autonomy for domestic objectives.

Another factor is the IMF leadership. Dominique Strauss-Kahn has been angling to reshape the tattered image of the IMF, which had been significantly stigmatized after the Asian financial crisis. Many developing nations accumulated reserves, deployed capital controls, and set up regional financial arrangements in order to avoid the IMF in times of crisis. Projecting a "kinder" IMF has been part of Strauss Kahn's objective—which has become all the more important as he pursues the French Presidency. Many emerging markets were deploying controls, the IMF wasn't about to pick a fight (Grabel, 2010).

Inside the IMF, staff continued to labor at rigorous econometric analyses of the impacts of capital controls. Following the Asian crisis, economists such as Kenneth Rogoff (Harvard) and Carmen Reinhardt (Maryland) formed the top leadership of the IMF's research department. Both these economists have done enormous research on financial crises and have shown how capital flows can be disequilibrating. Reinhardt (along with Magud who also went to the IMF) was the author of a definitive National Bureau of Economic Research survey of the most rigorous studies on capital controls. The staff not only produced a sheer mountain of evidence, such research was legitimitzed because it was overseen by some of the most well-known and highly regarded academic economists as well.

The United States has been ambivalent on one level, and quietly against controls on another. The U.S. saw to it that early G-20 communiques called for nations to allow capital to continue to flow freely across borders. However, at the 2011 G-20 summit in Seoul the U.S. endorsed a communiqué that, while not mentioning capital controls explicitly, G-20 leaders called on the IMF and others "to do further work on macro-prudential policy frameworks, including tools to mitigate the impact of excessive capital flows." (G-20, 2010). U.S. Treasury Secretary Timothy Geithner also endorsed Brazil's capital controls in a February 2011 speech there (Winter, 2011). In conversation with senior officials at the U.S. Treasury Department in preparation for this paper, the U.S. "lenience" on this issue at the G-20 marks a shift from the Bush administaration and shows that "the door is ajar on capital controls." That said, among the chief objectives of the Treasury Department is global rebalancing. Thus the U.S., if it ever were to explicitly acknowledge the usefulness of capital controls, would not treat them equally. To the U.S., nations such as China have undervalued currencies that have contributed to global imbalances. Capital controls to tame currencies in those nations would thus garner less support than, say nations like Thailand that have been attempting to stem asset bubbles (DOT, 2011). In February of 2011, US Treasury Secretary was said to have tacitly endorsed Brazil's capital controls when he said that countries such as Brazil may need to adopt carefully designed macroprudential measures to stem inflows." (Winter, 2011).

While the door for capital controls may be ajar in terms of global economic governance, it remains shut with respect to U.S. trade and investment treaties. Whereas U.S. trade treaties granted nations (like Mexico under NAFTA) safeguards to use controls in to prevent balance of payments problems, treaties under the administration of George Bush eliminated such safeguards. Capital controls and trade treaties became a highly controversial issue in negotiations with Chile and Singapore in the early 2000s. Chile has been well known for its unremunerated reserve requirement whereby a certain percentage

of capital inflows need to be deposited in the Central Bank for a minimum period of time. This measure has been econometrically shown to have buffered Chile from the acute crises that struck the region in the 1990s. Singapore saw that Malaysia successfully deployed controls on outflows in the wake of the Asian financial crisis and wanted to reserve that option. The U.S. adamantly opposed such proposals and both treaties left capital controls actionable—though investors have to wait one year before suing for damages. The Bush administration negotiated similar deals with Peru, Panama, South Korea, and Colombia. The Obama administration has not gone back to the more permissive NAFTA model but ironically is working hard to pass the Bush era deals. In response to a letter where more than 250 economists urged the Obama administration to provide flexibility for controls in U.S. trade deals the U.S. replied that they did not intend to change treaties to that effect (Drajem, 2011). The global financial crisis, with its origins in the U.S., has changed the thinking and practice of many a nation and the IMF, but is yet to fully hit home on this matter (Gallagher, 2011).

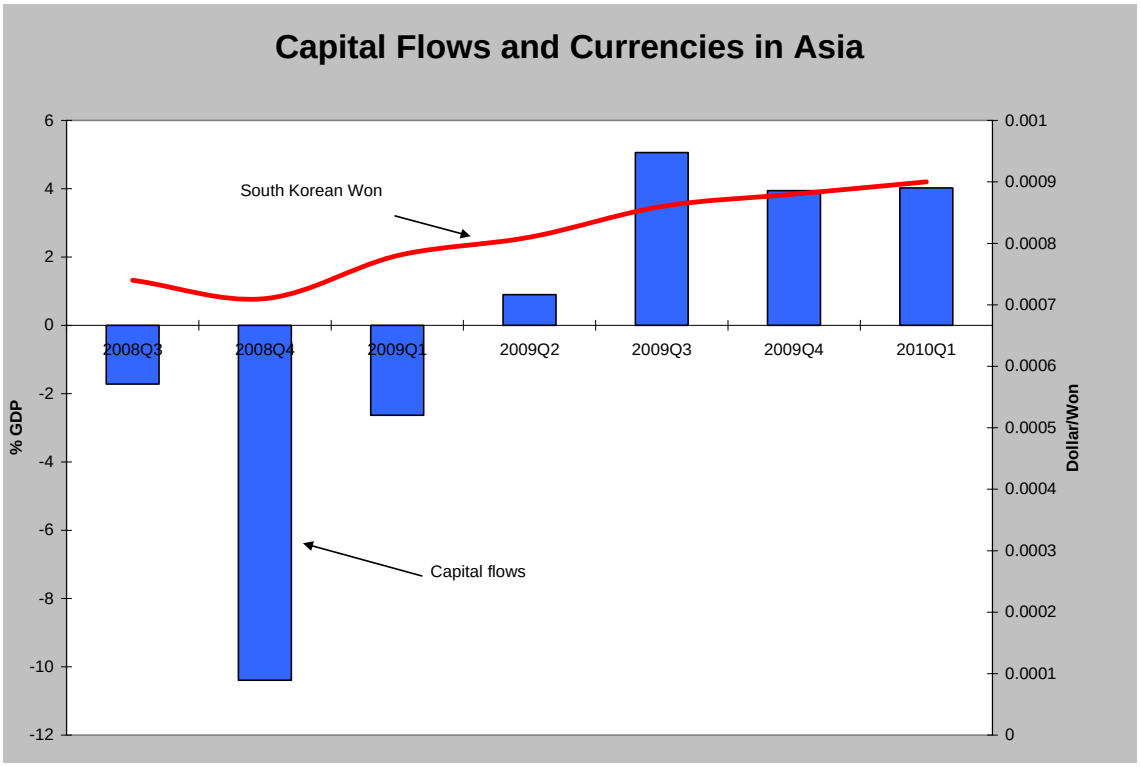
## III. Capital flows, Capital Controls, and the Global Financial Crisis

This section of the paper shows how the global financial crisis has been characterized by enormous swings in global capital flows and how some nations have attempted to stem such flows with capital controls. First is a discussion of the role of capital flows in the crisis. Second is a short discussion of the types of capital controls that have generally been deployed by nations over the past 15 years. Finally, a discussion of the capital controls used by various emerging market nations since 2009 is presented.

### *Capital flows during the Global Financial Crisis*

Capital flows, defined as non-foreign direct investment flows, were pro-cyclical during the global financial crisis. There was too much capital during the boom(s) and too little during the busts. Between 2002 and 2007 there were massive flows of capital into emerging markets and other developing economies. After the collapse of Lehman Brothers there was capital flight to the “safety” of the U.S. market, wreaking havoc in emerging markets. As interest rates were lowered for expansionary purposes in the industrialized world between 2008 to 2011, capital again began to expand into emerging markets were interest rates and growth were relatively higher. The carry trade was a key mechanism that triggered these flows. Increased liquidity induced investors to go short on the dollar and long on currencies in nations with higher interest rates. With significant leverage factors, investors gained on both the interest rate differential and the exchange rate movements.

## Table 2




*Source: IMF World Economic Outlook , October 2010 (Asia includes: South Korea, Malaysia, Philippines, Singapore, Taiwan, and Thailand)*

Table 2 shows non-FDI capital flowing to Asia beginning with the third quarter of 2008. During the fourth quarter of 2008 there was capital flight amounting to ten percent of GDP and a corresponding depreciation of the currency. Beginning in 2009 however, capital flows resurged into Asia, reaching pre-crisis levels. Table 2 juxtaposes the surge in capital flows with the South Korean won, which appreciated over thirty percent during the period. In South Korea, and throughout the region, currency appreciation and asset bubbles were a significant worry throughout 2010 and into 2011.

The carry trade can be de-stabilizing for four reasons. First, if capital flows are large enough such speculation can cause undue volatility of exchange rates and asset prices in developing economies. Second, relatively small interest rate or currency changes can trigger an unwinding of (highly leveraged) positions which can cause sudden stops and capital flight. Third, a sudden unwinding of positions where the investment entity is highly interconnected with other parts of the financial system to the extent that it's demise might cause systemic risk, the carry trade can threaten general financial stability (Brunnermeier 2008) .

Fourth, in an environment where nations have open capital accounts, the carry trade can have further destabilizing effects in terms of policy space for independent monetary

policy. The dominant tool to stem asset bubbles or inflation is the interest rate. However, because of the carry trade the intended result can be the reverse if interest rates are low abroad. Given that rates were over 10 percent in Brazil and less than one percent in the U.S., raising interest rates to curb asset bubbles and inflation would actually attract more capital flows, not less.

Keynes saw this as a fundamental concern:

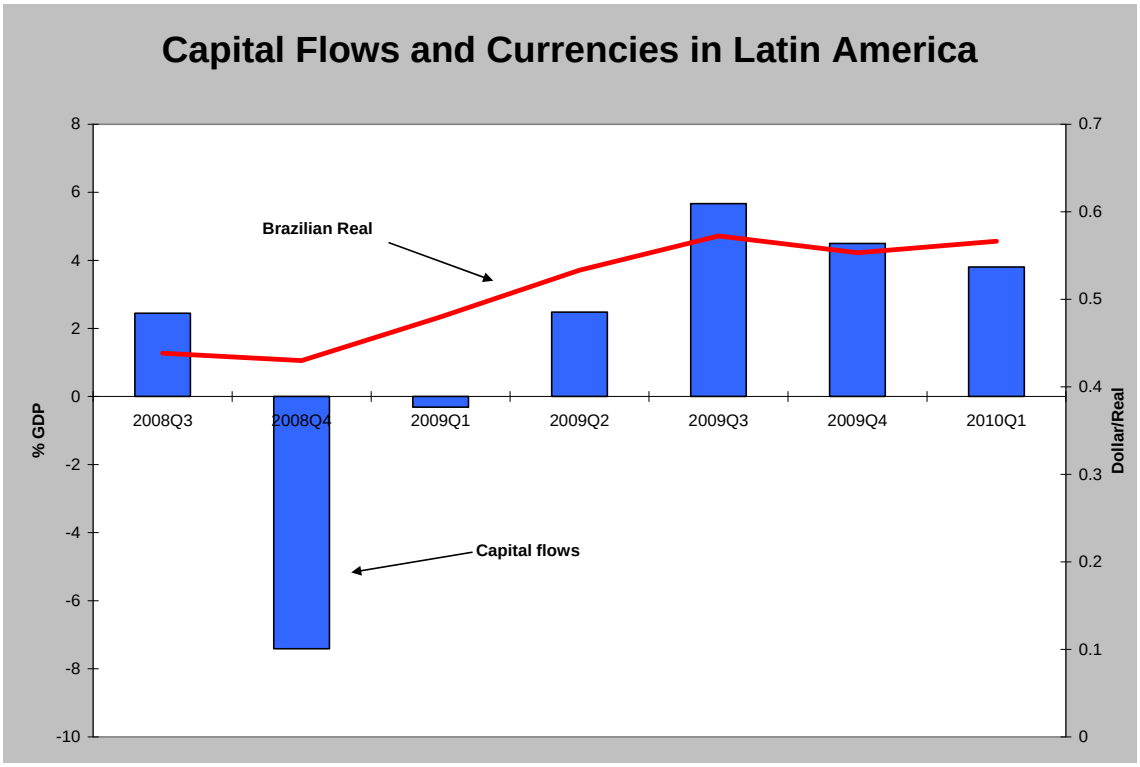
> In my view the whole management of the domestic economy depends on being free to have the appropriate rate of interest without reference to the rates prevailing elsewhere in the world. Capital controls is a corollary to this. (quoted in Helleiner, 1994, 34.)

Paul Davidson, elaborating on Keynes' rationale for capital controls said

> If there is a sudden shift in the private-sector's bull-bear disposition, what can be called the bandwagon effect, then price stability requires regulations constraining capital flows into and/our out of the market to preven the bears from liquidating their position too quickly (or the bulls from rushing in) and overcoming any single agent (private or public) who has taken on the responsible task of market maker to promote "orderliness." (Davidson, 2009, 100).

The carry trade has become highly utilized by shadow banking entities such as hedge funds. In the run up to the crisis it was the U.S. that was affected by such activity. By 2004-05 hedge funds became major players in the carry trade, often borrowing in the Japanese yen market where rates were relatively high, and investing in the U.S. (D'Arista and Griffith-Jones, 2010).

Table 3




*Source: IMF World Economic Outlook, October 2011.*

In the wake of the crisis hedge funds have begun to short the dollar and go long on currencies from countries with healthier economies and higher interest rates. The carry trade can be lucrative in at least three ways for investors. First is the interest rate differential. If the U.S. interest rate is .025 and Brazil's is 10.50 then the differential could be 10.25 (minus transaction costs). The real profits come from leverage and the exchange rate movements. Hedge funds speculate that the higher rate currency is going to appreciate in addition to earning the interest rate differential. Profits can ramp up depending on the leverage factor. A leverage factor of 5 on a 10.25 differential is a profit of 50.25 percent and a ratio of 10 on a 10.25 differential could be 100.25 percent. Third, those profits come when exchange rates stay stable, but can be magnified if when the currency shorted depreciates and the long position appreciates. Given the more robust growth and higher interest rates in emerging markets, the carry trade resulted in another mass inflow of capital to the developing world in 2009-2011.

Brazil is a case in point with interest rates in 2009 and 2010 of over 10% and the U.S. interest rate of close to zero. Brazil saw an appreciation of over 30% due in part to the carry trade. Indeed it was Brazil that was most vocal at the 2010 G-20 Summit in Seoul where the Brazilian finance minister declared the surge in capital flows, the subsequent appreciations, and the myriad reactions to the surges as the beginning of a "currency war." As Table 3 shows, Latin America has also seen a resurgence of capital flows, and currency concerns have plagued nations such as Brazil, Chile, and others

In an attempt to throw a wedge between the interest rate differential and its detrimental effects on financial stability, many nations resorted to capital controls in 2009 and 2010.

*Capital Controls and other Capital Management Techniques*

Capital controls are deployed to help buffer from a number of risks that come with financial integration. Chief among those risks are currency risk, capital flight, financial fragility, contagion, and sovereignty (Grabel, 2003). All of these risks have been accentuated during the global financial crisis. As previously noted the uptick in the carry trade from 2009 to 2011 put pressures on currency, financial fragility, and made it more difficult for nations to have sovereignty over monetary policy. Capital controls are seen as macro-prudential regulations that can help manage those risks (Ocampo et al, 2008).

Economists usually differentiate between capital controls on capital inflows and controls on outflows. Moreover, measures are usually categorized as being "price-based" or "quantity-based" controls. Table 4 lists examples of controls on inflows and outflows, though sometimes the distinction can be murky (Epstein, Grabel, and Jomo 2008; Ocampo, Kregel, and Griffith-Jones 2007). Examples of quantity-based controls are restrictions on currency mismatches, and minimum stay requirements and end-use limitations. Many of these have been used by nations such as China and India. Examples of price-based controls include taxes on inflows (Brazil) or on outflows (Malaysia). Unremunerated reserve requirements are both. On one hand they are price-based restrictions on inflows, but they also include a minimum stay requirement which can act like a quantity-based restriction on outflows.

Table 4

## Capital Controls and Capital Management Techniques

| ***Inflows*** |
|---|
| Restrictions on currency mismatches* |
| End use limitations** |
| Unremunerated reserve requirements*** |
| Taxes on inflows |
| Minimum stay requirements |
| Limits on domestic firms and residents from borrowing in foreign currencies |
| Mandatory approvals for capital transactions |
| Prohibitions on inflows |

| ***Outflows*** |
|---|
| Limits on ability of foreigners to borrow domestically |
| Exchange controls |
| Taxes / restrictions on outflows |
| Mandatory approvals for capital transactions |
| Prohibitions on outflows |

**borrowing abroad only allowed for investment and foreign trade*

***only companies with foreign currency reserves can borrow abroad*

****percent of short-term inflows kept in deposit in local currency for specified time*

*Sources: (Ocampo, Kregel, Griffith-Jones, 2007; Epstein, Grabel, Jomo, 2008)*

Controls are most often targeting foreign-currency and local currency debt of a short-term nature. Foreign direct investment is often considered less volatile and less worrisome from a macroeconomic stability standpoint. Inflow restrictions on currency debt can reduce the overall level of such borrowing and steer investment toward longer-term productive investments and thus reduce risk. Taxes on such investment cut the price differential between short and long term debt and thus discourage investment in shorter-term obligations. Outflows restrictions and measures are usually deployed to "stop the bleeding" and keep capital from leaving the host nation too rapidly. A variety of these techniques have been used during the global financial crisis. Indeed, as previously noted, the IMF found that those nations that deployed controls were among the least hard hit from the crisis (Ostry et al, 2010).

### *Capital Controls and the Global Financial Crisis*

While currency appreciation, asset bubbles, and inflation became a concern across the developing world in 2009-2011, not all nations deployed capital controls. Some nations, such as Chile, Japan, and Mexico, intervened in currency markets by purchasing dollars in order to weaken their own currencies. Another interesting case was that of Turkey,

that actually lowered interest rates to stem asset bubbles and inflation. Citing the carry trade, Turkey lowered rates hoping to shorten the spread between U.S. and Turkish interest rates and thus cool off the economy. Table 5 exhibits an illustration of a number of nations that have deployed some sort of capital management technique on capital inflows during the crisis.

Table 5

**Capital Management Techniques in the Wake of the Financial Crisis**

| Country | Date | Measure | Description |
|---|---|---|---|
| Brazil | 20-Oct-09 | Inflows tax (2 percent) | The IOF tax applies upon conversion of foreign currency into Brazilian reais related to equity or debt investments by foreign investors on the Brazilian stock exchanges (principally BM&F-BOVESPA) or the OTC market, as well as private investment funds (FIP), Brazilian treasury notes and other fixed income securities. |
| | 19-Nov-09 | ADR tax (1.5 percent) | levied on the creation of depositary receipts by companies or investors converting local shares |
| | 4-Oct-10 | Inflows tax (4 percent) | IOF tax, raised to 4 percent |
| | 18-Oct-10 | Inflows tax (6 percent) | IOF tax, raised to 6 percent |
| | 6-Jan-11 | reserve requirement | Brazilian financial institutions must deposit the equivalent of 60 per cent of any short dollar position with the central bank after subtracting either $3bn or the value of their tier-one capital, whichever is smaller |
| Indonesia | 16-Jun-10 | minimum stay (1 month) | One-month minimum holding period on Sertifikat Bank Indonesia (SBIs) certificates (Central bank). During the one-month period, ownership of SBIs cannot be transferred. Issuance of longer-term bonds. Short-term external bank borrowing limited to 30 percent of capital. |
| South Korea | 1-Jul-10 | Currency controls | For Korean banks, there will be a limit on currency forwards and derivatives positions at 50% of their equity capital. For foreign banks, the ceilings will be set at 250% of their equity capital, against the current level of around 300%. Tightening of the ceilings on companies' currency derivatives trades to 100% of underlying transactions from the current 125%. |
| | 1-Jul-10 | End use limitations | Bank loans in foreign currency are allowed for purchase of raw materials, FDI and repayment of debts. Only in certain cases, such loans could be used for domestic use. Under the new rules, such loans will be restricted for overseas use only. As an exception, only the small- and medium-sized enterprises have been allowed to use foreign currency financing for domestic use, to the extent that total foreign currency loans remain within the current levels. |
| | 19-Dec-10 | Outflows tax | 20 basis-point levy on overseas debt maturing in less than one year. Levy would initially be applied to banks, though could be expanded to all financial institutions if needed |
| Taiwan | 10-Nov-09 | Controls on inflows | Bans foreign funds from investing in time deposits in a move aimed at deterring bets on currency appreciation. |
| | 21-Dec-10 | Currency controls | Banks' holdings of non-deliverable forwards and options in the Taiwan dollar will be limited to 20 percent of local currency positions |
| | 30-Dec-10 | Reserve requirements | lifted the reserve requirement on some local-currency deposits by foreigners to as much as 90 percent. |
| Thailand | 13-Oct-10 | Inflows tax (15 percent) | 15 percent withholding tax on interest and capital gains earned by foreign investors on bonds issued by the government, the central bank and state enterprises |

*Sources: Bloomberg, various dates, Financial Times, and IMF World Economic Outlook, October 2010*

This list is only illustrative of changes in capital control regulations in 2009 and 2010. According to the IMF's Annual Report on Exchange Arrangements and Exchange Restrictions, 2010, 144 countries report capital controls on capital market securities, 124 on money market instruments, 94 on derivatives, 86 on commercial credits, and 120 on financial credits (IMF, 2010). This stands in contrast with 1995, where only 119 nations reported capital controls of any kind to the IMF (Helleiner, 1998). The list in Table 5 exhibits some of the major nations that have instated controls during the 2009-2011 period, but does not list nations such as India and China that have had controls throughout.

With the exception of Brazil, the nations that have received the most attention for deploying capital controls are in East Asia. Brazil, South Korea, and Taiwan have been the most aggressive in deploying controls. As the table shows, those three nations "fine tuned" their controls in a number of instances.

By October of 2009 Brazil's exchange rate pressures became acute, and on October 20 Brazil resorted to capital controls. Brazil deployed a tax on inflows, referred to as the "IOF tax" (IOF is (Imposto sobre Operações de Crédito, Câmbio e Seguro, ou relativas a Títulos e Valores Mobiliários in Portuguese). The initial tax rate was 2 percent that applied conversion of foreign currency into Brazilian reais related to equity or debt

investments by foreign investors on the Brazilian stock exchanges or the over the counter derivatives market, as well as private investment funds (FIP), Brazilian treasury notes and other fixed income securities.

While the exchange rate cooled upon announcement of the controls, the controls were seen as ineffective partly due to evasion. Brazil determined that foreign investors were circumventing controls by disguising short-term capital as foreign direct investment, through currency swaps and other derivatives, and by purchasing American depositary receipts (ADRs). ADRs are issued by US banks and allow investors to buy shares of firms outside the US – enabling investors to purchase Brazilian shares but in New York and thereby skirt controls in Brazil. Therefore on November 18, Brazil moved to put a 1.5% tax on ADRs to stem speculating around the October controls. A year later, Brazil's exchange rate continued to appreciate and Brazil increased the IOF tax to 4 and then 6 percent. In interviews with private investors, The Financial Times reported that the tax did not factor into investor decision-making given that the interest rate differential between the U.S. and Brazil was so wide. However, when the tax was raised to 6 percent, some investors began to see the trade as less profitable and shied away (Jopson, 2011). Nevertheless in early January of 2011, Brazil made yet another move. Starting on January 6, Brazilian financial institutions had to begin to deposit the equivalent of 60 per cent of any short dollar position with the central bank to curtail betting against the domestic currency.

Nations across Asia deployed controls in 2009. Indeed, they were told to do so by the Asian Development Bank (ADB). In April of 2010 the President of the ADB said "With the possibility of resurgent capital inflows, it is essential that they are managed effectively. An appropriate mix should address currency flexibility, clear and stable monetary and fiscal policy, an appropriate regulatory and supervisory framework, and even temporary capital controls."(Yong and Seo, 2010)

South Korean saw some of the largest appreciation in its currency, the won. Starting in July of 2010 then, South Korean banks had to limit their currency forward and derivatives positions at 50% of their equity capital. For foreign banks, the ceilings were set at 250% of their equity capital, against the current level of around 300%. Tightening of the ceilings on companies' currency derivatives trades to 100% of underlying transactions from the current 125%. Also at that time South Korea sought to steer investment away from speculative capital by requiring that (with some exceptions) bank loans in foreign currency be allowed solely for purchase of raw materials, FDI and repayment of debts. Following skirmishes with North Korea, South Korea also taxed outflows in December of 2010.

Taiwan has also introduced controls on numerous occasions. Interestingly in the Taiwanese case they would signal to markets that capital controls were coming a few weeks or sometimes months before each move. Indeed, Taiwan's Central Bank Governor urged other nations across Asia to use capital controls as well (Chang, 2010). Taiwan's moves followed the timing of others. In November of 2009 Taiwan put in place bans on foreign funds from investing in time deposits in a move aimed at deterring bets on

currency appreciation. Twice at the end of 2010 Taiwan limited the percentage of currency that could be held by banks.

Of course the other significant Asian nation that received mass inflows of capital during this period was China. From 2009 to 2011 there were daily reports in the English-language press that China was experiencing a housing boom and inflation (stocks to not trade freely in China and of course its exchange rate is pegged to the U.S. dollar). China has deployed controls for quite some time, and the majority of those controls would be considered quantitative controls. For instance, China does not permit foreigners to invest in China's money markets or derivatives markets, and an intricate approval process is involved for foreigners to take part in stock and bond trading. Similar measures apply for outflows (Yu, 2011). Given China's pegged exchange rate, it suffers from the "impossible trinity" described above and China sees it as important to have an autonomous monetary policy. Numerous studies have shown that China's capital controls continue to be effective to this end, though there has been some weakening (Ma and Mcauley, 2007). In 2011 China relaxed some of its outflows controls to take the pressure off extreme inflows of capital. Before January of 2011, Chinese exporters used to have to turn over the majority of their U.S. dollar (profits) to the Chinese government in exchange for yuan. To stem asset bubbles and inflation, China moved to allow foreigners to keep their money abroad (Back, 2011).

## IV. Just one rock in a swiftly flowing stream? *A Preliminary Analysis*

This section of the paper performs a preliminary analysis of controls in three countries that have resorted to controls since the crash of Lehman Brothers in 2008. A full econometric analysis is in order along the lines of an earlier paper I did that tested the impact of capital controls in Colombia and Thailand in the run up to the crisis in 2007 (Coehlo and Gallagher, 2010). At this writing however, the data needed to compile a comprehensive database of independent variables from which to complete such an analysis is not yet available. Nevertheless, this preliminary analysis can shed light on how the dependent variable behaved in general. A number of minor statistical tests and counterfactuals are presented to interpret the data.

The stated goal of capital controls on inflows is to create a space for independent monetary policy, and to stem the appreciation of the currency and the rise in asset prices. In this section of the paper then, I examine trends in interest rate differential, currencies, and asset prices in Brazil, Taiwan, and South Korea—three nations in Table 5 that have been most aggressive in their use of controls in the wake of the crisis. If we are to see an effect of controls anywhere, it would be in these nations. Table 6 summarizes the results of these exercises. All data for these analyses are from Bloomberg (Bloomberg, 2011). Full statistical results are in appendices 1-4.

Table 6

**Effectiveness of Capital Controls: Summary Table**

| | Brazil | | South Korea | | Taiwan | |
|---|---|---|---|---|---|---|
| ***Measures*** | ***Before*** | ***After*** | ***Before*** | ***After*** | ***Before*** | ***After*** |
| **Interest Rates** | | | | | | |
| Interest Rates correlation | + | Slightly less correlated | - | Less correlated | + | Eventually becomes less correlated |
| Average Interest Rates Differential | + | Gradually widens | + | Wider differential | + | Gradually widens |
| Interest Rate Differntial (Adj) | + | Initally narrows but widens by 6% tax | + | Narrows | + | Differential eventually becomes wider |
| **Exchange Rates** | | | | | | |
| Level of spot rate appreciation | + | appreciation slows | + | appreciation continues | + | Level of appreciation eventually smaller |
| Rate of spot rate appreciation | + | rate of appreciation slows | + | rate of appreciation rises | + | rate of appreciation eventually slows |
| **Asset Prices** | | | | | | |
| Stock Market appreciation level | + | index continues to rise but less so between each measure and less than regional average | + | Index continues to rise but less so, especially related to regional average, then reverses course, but less so than region | + | index continues to rise after first two measures but lower level increases each time and relative to region; decrease after final measure as does |
| Stock Market appreciation rate | + | rate fluctuates between measures but always better than regional average | + | rate of increase faster than before measure and faster than regional average, then actual decrease after second measure that is sharper than regional average | + | rate of increase slower than previous period and than region for first measure, slower than region for second measure; decrease after third measure but less so than region |

*"+" refers to increase, appreciation, etc*

*Source: Bloomberg Terminal, accessed February 11, 2011.*

## *Interest Rate Differentials*

Given that the surge in capital inflows is in large part due to the carry trade, the logical place to start a preliminary examination is by looking at interest rates. As shown in Table 6, the cases of Brazil, South Korea, and Taiwan all provide some evidence that interest rates between the U.S. and each of these nations has become less correlated and that the interest rate differential widened. This indicates that that the controls in each of these nations have to some extent met their objective of allowing a nation to have a more autonomous monetary policy.

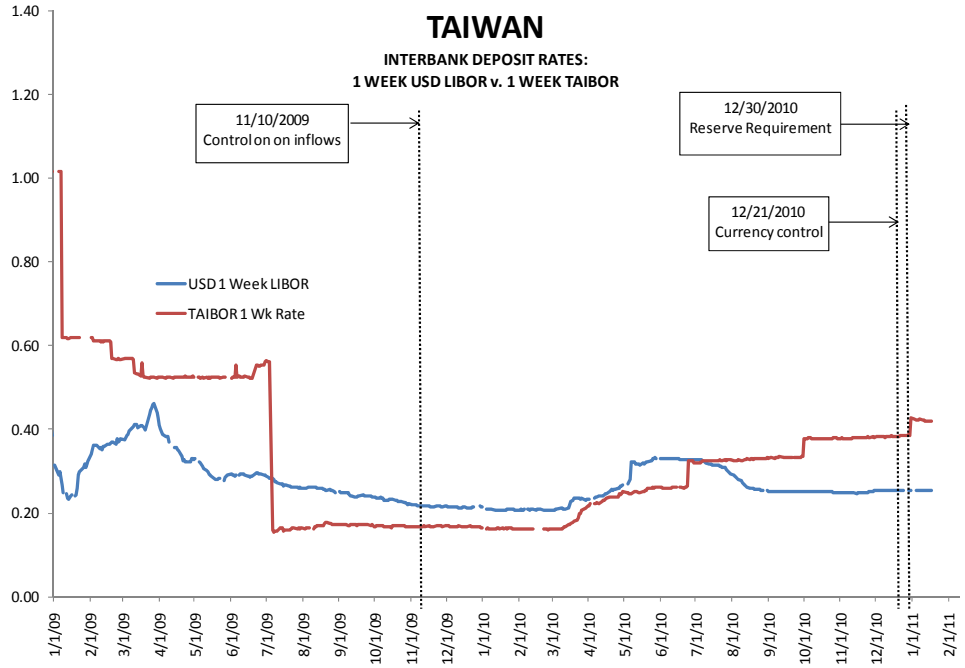
The spread on interest rates via the carry trade is one of the key incentives to move capital to emerging markets. Standard theory indicates that capital will flow from nations with lower interest rates to those with higher rates, eventually equalizing the two. The covered interest rate theorem states that in an environment of perfect capital mobility, interest rates should converge (Stein, 1962; Aliber, 1973). According to the interest rate parity theorem (equation 1):

$$(1 + r) = (1 + r^{*})(F/s). \qquad (1)$$

where ***r*** and ***r**** are interest rates in two different countries and ***F*** is the forward exchange rate between the two countries' currencies, and ***s*** is the spot rate. The differential should be zero or moving toward zero with free movement of capital between both nations.

As shown in the appendix to this paper, in Brazil, South Korea, and Taiwan the interest rate differentially eventually widens after successive controls are put in place, and the interest rates between each country and the United States eventually become less correlated. Figure 1 exhibits comparable interest rates for Taiwan and the United States for illustrative purposes. Different instances of capital controls are noted with text boxes and arrows. It appears that the controls on inflows had no real impact on interest rate differentials in November of 2009, but after currency controls and reserve requirements at the end of 2010 there was indeed a move away from parity.

Figure 1




**Source:** Bloomberg, accessed February 11, 2011.

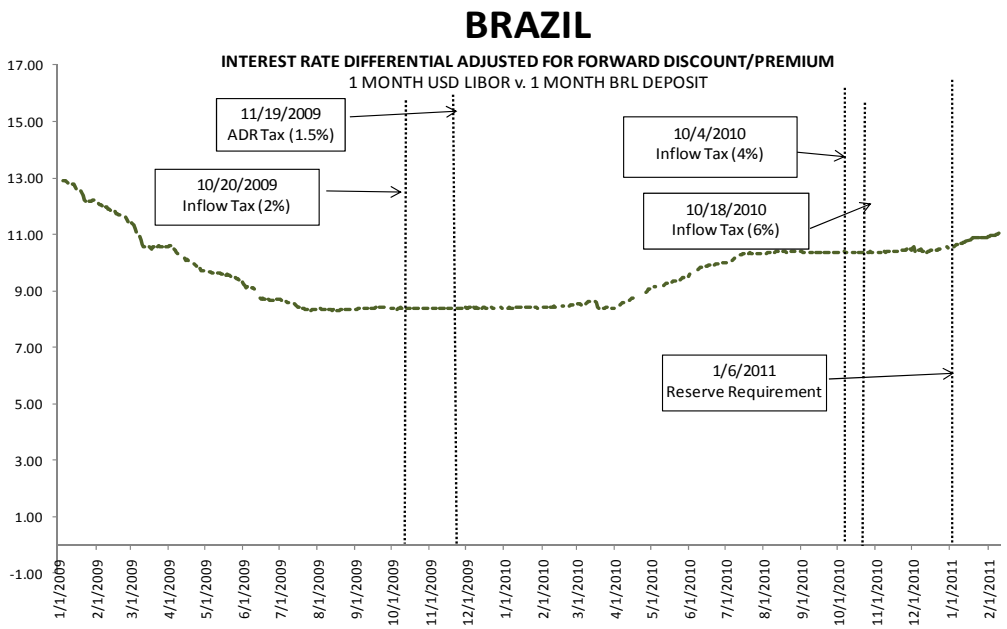
However, there is also some degree of consensus in the literature that interest parity examinations must also adjust for the future expectations of interest and exchange rates. If expectations are that an interest rate will decrease, such expectations will be reflected in futures prices and the differential would need to be adjusted downward. Interest rate differentials are adjusted upward in cases where the interest rate is expected to increase. Therefore it is common to examine the interest rate differential by adjusting for the forward discount. To calculate the extent to which there is deviation in the adjusted interest rate differential, the following calculation is made (equation 2):

$$d,=[(1 + r) -(1 + r^{*} )]- (F-s). \qquad (2)$$

here *d* is the deviation from the parity condition. One common test to analyze the extent to which controls are effective is to examine whether the interest rate differential adjusted for the forward discount is more or less correlated (or deviating) before and after a control is deployed. If a policy measure was meeting its stated goal the interest rates would be less correlated. This would indicate that the nation would be able to deploy more independent monetary policy.

Interest rate differentials and interest rate differentials adjusted for the forward discount are computed for Brazil, Taiwan, and South Korea's controls. In each case the average interest rate differential is examined before and after a control is deployed. Here the results are more mixed. In Brazil the adjusted interest rate differential does not widen until after Brazil strengthens the IOF tax to 6 percent. This is consistent with anecdotal evidence reported in the Financial Times: "But the bond tax, known as the IOF, can take a large chunk of any profit flowing from that gap, especially for investors trading on timescales of less than a year. Several fund managers told beyondbrics, the FT's emerging market blog, the appeal of the carry trade had diminished considerably as a result." (Jopson, 2011). In Taiwan there was also an eventual widening of the adjusted interest rate differential, but in the case of South Korea the differential narrows. Figure 2 exhibits the trend for Brazil.

Figure 2




**Note:** Calculated as [(BRL Deposit - USD LIBOR) - (Fwd NDF Rate- Spot Rate)]
**Source:** Bloomberg Terminal, accessed February 11, 2011.

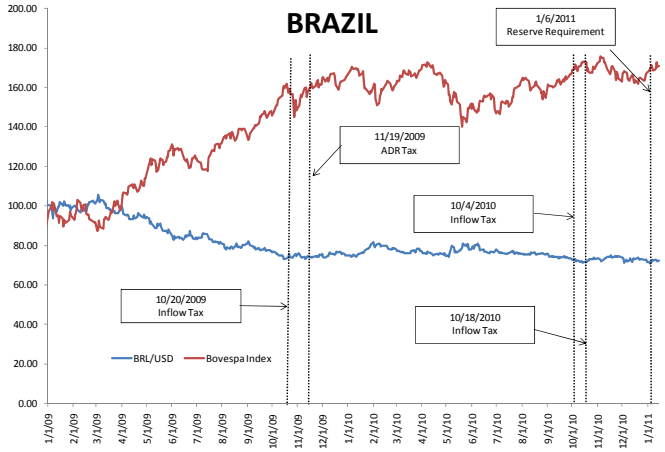
*Exchange Rates*

Another key goal of capital management techniques is to stem the rise of the exchange rate. If capital controls were to have any effect on the exchange rate we would expect to see a depreciation or at least a slower rate of appreciation after a control was deployed. For this paper the absolute level of exchange rate appreciation or depreciation before and after a control is measured, as is the rate of appreciation. Again, in the cases of Brazil and Taiwan there is some evidence that controls are associated with a lower level of appreciation and an eventual slowing of the rate of appreciation. However, in the case of South Korea, currency appreciation continues and the rate of appreciation increases after controls are initiated. Trends for exchange rates are exhibited in Figure 3 and in specific detail in Appendix 3.

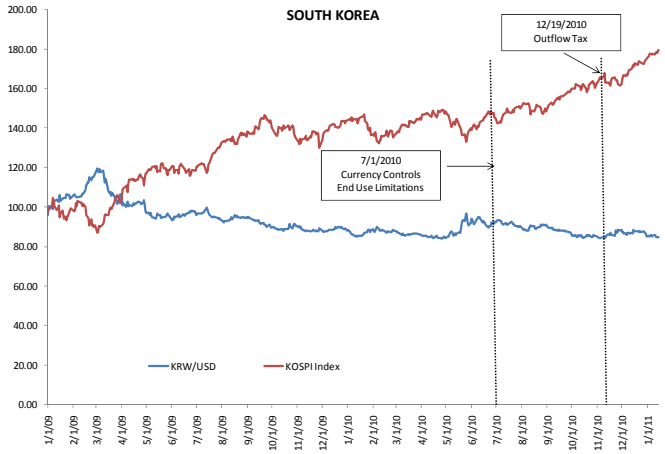
*Asset Prices*

Capital controls are also established in an attempt to cool overheating of asset prices, namely stock and real estate markets. There is some, but more limited, evidence that controls are associated with the desired affects in stock markets. For this paper a preliminary analysis of stock markets was conducted. If we were to observe a positive impact of controls on asset prices we would expect that prices would either decrease or increase at a lower rate. Unfortunately real estate market was not available for this analysis, and only stock market indices are analyzed. As a counterfactual, results are juxtaposed with regional averages. Thus, if controls were to meet their stated goals they would be associated with a decrease in the stock index (or a slower increase) that was also more of a decrease than the regional average. The results are shown in detail in the appendix. In Brazil the stock market index continued to rise after each measure was introduced but the total amount of appreciation after the measure was introduced was less than in the period before the measure and in each case the rate of increase was less than the regional average. However, the rate of stock market increase fluctuates between each measure though always seems to be better than the regional average. Figure 3 exhibits stock market indices and currency appreciation in the three nations analyzed.

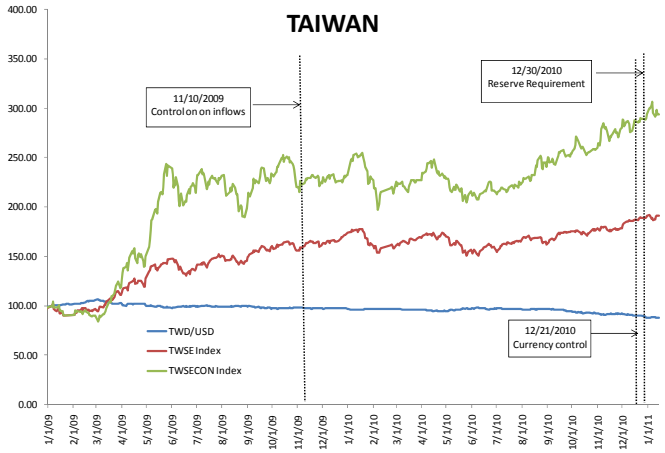
Figure 3: Currencies and Stock Markets




**Note:** 1/5/2009 indexed to 100.
**Source:** Bloomberg, accessed January 22, 2011.




**Note:** 1/5/2009 indexed to 100.
**Source:** Bloomberg, accessed January 22, 2011.




**Note:** 1/5/2009 indexed to 100.
**Source:** Bloomberg, accessed January 22, 2011.

These tables exhibit exchange rates and stock market indices indexed to 100 on January 1, 2008. In South Korea the index continues to rise after each measure but the total

amount of increase is lower than in the period previous to the measure and is less of a rise than the regional average. After the final measure is introduced there is an actual decrease in the stock market index and a decrease that is sharpter than the regional average. In Taiwan the results are similar, with lower levels of increase after each measure with an eventual decrease but one that is less so than the region as a whole.

## IV. 21st Century Challenges

This paper has traced the re-emergence of capital controls as effective tools to promote financial stability, in both theory and practice. There has been a great rethinking of capital controls, so much so that a number of nations deployed them in the wake of the global financial crisis and that the global community is now poised to consider a global regime. The paper examines capital controls in three countries: Brazil, South Korea, and Taiwan. The preliminary analysis conducted reveals some evidence that controls were eventually effective in Brazil and Taiwan, but less so in South Korea.

It is quite remarkable that capital controls continue to have some positive effect given the sheer level of capital flows in today's global economy, the lack of national effectiveness in governing controls, and foremost the lack of international cooperation (and even acceptance) with regards to capital flows. To echo the IMF, capital controls are now an essential part of the financial stability toolkit. However, to ensure that capital controls are fully effective, they will have to be buttressed by national and global level compliance and cooperation. There are at least five challenges to achieving full effectiveness: designing stiff regulations, creating effective compliance of regulations, harnessing global coordination of regulation, and perhaps most challenging is the political-economic context of decision-making.

First, at the national level, capital controls will need to be designed with more strength and be accompanied by significant levels of surveillance mechanisms. One of the reasons why some of the more recent uses of controls appear to be lackluster in their effectiveness is that they are weak relative to the spread in the carry trade. In the 1990s Chile and Colombia each deployed unremunerated reserve requirement (URRs). A URR is a mandatory non-interest-bearing deposit in foreign currency at the Central Bank for a certain period in an amount proportional to the size of the capital flow (30% for Chile, 47% for Colombia). The tax equivalent of Chile's controls averaged 4.24% and was as high as 7.7%. Colombia's ranged from 6.4% to 13.6% (Gallego and Hernandez, 2003; Ocampo and Tover, 1999). Each of these tax equivalents is almost two to seven times stronger than Brazil's initial IOF tax controls.

A second challenge for national governments is the ability of nations to circumvent controls. One of the most profound ways that controls have been circumvented in Brazil's past has been through disguising short-term capital as FDI. In Brazil investors would create a public company and list it on the BOVESPA. The investor would own all the company's shares and manipulate their price by arranging purchase and sale at low liquidity. The foreign investor would then invest in the public company as a foreigner

and deem the investment an FDI investment because it acquired more than half of the shares and then performed inter-firm loans that are considered FDI. (Carvalho and Garcia 2006).

China has an intricate and notable surveillance system. In August of 2008 China instated a new regime gives numerous authorities the power to verifying foreign exchange flows. Indeed, among other measures, numerous ministries have linked computer systems that check and track the "authenticity" of foreign exchange transactions to "eliminate the discrepancies between the true proceeds from exports and the reported receipts of foreign exchange. "(Yu, 2009, 9).

Third, national efforts alone cannot solely be relied on to regulate capital flows. As Keynes and White articulated when framing the Bretton Woods system, global coordination is the key to effective capital flow management. Coordination is needed in three ways. First, nations need to help each other cooperate on policing capital controls. Helliener quotes Keynes as saying controls will be more difficult to make work "by unilateral action than if movements of capital can be controlled at both ends." (Helleiner, 1994, 24). According to Helleiner (1994), Keynes and White saw nations cooperating to share information about financial holdings within their countries that might have been disguised to circumvent controls, helping to repatriate capital that left a nation illegally, and even blocking flows of capital seen as illegal in a sending nation.

In the wake of the global financial crisis, some authors of proposed coordinated imposition of capital controls. For instance, to mitigate the effects of the carry trade, to place controls on outflows in nations with the low interest rate corresponding with controls on inflows in nations with the higher rate (Griffith-Jones and Gallagher, 2011). Indeed, this occurred to some degree of success in the 1960s. In the late 1960s the U.S. experienced balance-of-payments difficulties due to expansionary monetary and fiscal policies (which included relatively low interest rates). Meanwhile, European governments had grave concern over capital inflows due to higher rates and anti-inflationary policy.

The U.S. put in place outflows controls- -U.S. outflows controls took the form of the *Interest Equalization Tax* that taxed U.S. residence from investing in foreign securities-- and Europe controlled inflows (Block, 1977). Econometric evidence has shown that the U.S. controls on outflows were effective in allowing the U.S. maintain independent monetary policy despite the fact that the controls exempted banks who wanted to speculate in the Eurodollar market (Obstfeld, 1993). In an act of coordination, in 1971 France convinced the U.S. to maintain its outflows controls and West Germany to tighten them. The French went on to advocate that the powers of the IMF be extended to facilitate such coordination (Helleiner, 1994).

Another area for cooperation will be to strip away the patchwork of legal barriers to capital controls that are found in trade and investment treaties. Many treaties now cover financial instruments and investment, and prohibit nations from deploying capital

controls even on a temporary basis. At minimum a uniform safeguard exception to all trade agreements would need to be crafted, but would run against many vested interests.

It is clear that a new era has arisen in terms of capital controls. Institutions such as the IMF have come to recommending the national use of capital controls and many nations are following suit. In December of 2010 the IMF also recognized the need for cooperation on capital controls, and proposes that they fill that role. The IMF proposes to engage helping nations to design effective capital controls, in bi-lateral and multi-lateral surveillance of controls, and to help create the policy space in trade and investment treaties for safeguard clauses to allow for controls (IMF, 2010). It is not clear that the IMF has the legal standing to actually play the role it wants, and it is also not clear that the institution has the political legitimacy in many nations to carry out such a task.

Reflecting on the early discussion of the Bretton Woods system when capital controls were seen as a core of the global financial system, the political obstacles may be the biggest challenge for 21st century capital controls. It is clear that there has been: change in general thinking regarding states and markets; developments in economic evidence that support capital controls; and that a change in the level of global hegemony. It remains to be seen if such change is enough to create a level of 21st century embedded liberalism to enable a stable financial system.

The political obstacles to global coordination and national effectiveness for capital controls would have to overcome significant collective action problems. While all nations and actors within them benefit from financial stability, there are individual financial sectors that will have to bear short-term costs. These "losers" of a capital control regime are highly concentrated and very powerful politically. The "winners" in terms of the general public are diffuse across the entire system and may suffer from information externalities where they cannot "connect the dots" between capital regulations, financial stability, and personal welfare to the extent that they would mobilize politically. Second, there are free rider problems. If all nations do not enact cooperation and control then hot money can cascade where regulations are most lax. One nation's strong regulation could trigger speculation to its neighbors. Though it is increasingly becoming understood that capital controls help markets "get the prices right," a bigger challenge is "getting the political economy right."

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# Appendices

## 1. Interest rate differentials

**Capital Controls and Interest Rates**

| Capital Control | | | Interest Rate Correlation | | Average Interest Rate Differential | |
|---|---|---|---|---|---|---|
| Date | Measures | Interest Rates | Before | After | Before | After |
| | | **TAIWAN** | 01/02/09-11/09/09 | 11/10/09-12/20/10 | 01/02/09-11/09/09 | 11/10/09-12/20/10 |
| 11/10/2009 | Controls on inflows | USD 1 wk LIBOR v. TAIBOR 1 wk Rate | **0.63** | **0.48** | **1.29** | **1.05** |
| | | USD 1 wk LIBOR v. Euro 1 wk LIBOR | **0.45** | **0.09** | **2.57** | **1.70** |
| | | | 11/10/09-12/20/10 | 12/21/10-12/29/10 | 11/10/09-12/20/10 | 12/21/10-12/29/10 |
| 12/21/2010 | Currency controls | USD 1 wk LIBOR v. TAIBOR 1 wk Rate | **0.48** | **0.69** | **1.05** | **1.52** |
| | | USD 1 wk LIBOR v. Euro 1 wk LIBOR | **0.09** | **0.83** | **1.70** | **2.11** |
| | | | 12/21/10-12/29/10 | 12/30/10-01/14/11 | 12/21/10-12/29/10 | 12/30/10-01/14/11 |
| 12/30/2010 | Reserve requirements | USD 1 wk LIBOR v. TAIBOR 1 wk Rate | **0.69** | **-0.69** | **1.52** | **1.65** |
| | | USD 1 wk LIBOR v. Euro 1 wk LIBOR | **0.83** | **-0.83** | **2.11** | **2.04** |
| | | **SOUTH KOREA** | 01/02/09-06/30/10 | 07/01/10-12/17/10 | 01/02/09-06/30/10 | 07/01/10-12/17/10 |
| 7/1/2010 | Currency controls<br>End use limitations | USD 1 mth LIBOR v. KORIBOR 1 mth rate | **-0.08** | **-0.51** | **8.01** | **9.08** |
| | | USD 1 mth LIBOR v. Euro 1 mth LIBOR | **0.72** | **-0.64** | **2.13** | **2.44** |
| | | | 07/01/10-12/17/10 | 12/19/10-02/10/11 | 07/01/10-12/17/10 | 12/19/10-02/10/11 |
| 12/19/2010 | Outflows tax | USD 1 mth LIBOR v. KORIBOR 1 mth rate | **-0.51** | **0.24** | **9.08** | **10.55** |
| | | USD 1 mth LIBOR v. Euro 1 mth LIBOR | **-0.64** | **0.59** | **2.44** | **2.91** |
| | | **BRAZIL** | 01/02/09-10/19/09 | 10/20/09-11/18/09 | 01/02/09-10/19/09 | 10/20/09-11/18/09 |
| 10/20/2009 | Inflows tax (2 percent) | USD 1 mth LIBOR v. BRL 1 mth | **0.75** | **-0.43** | **29.43** | **35.83** |
| | | USD 1 mth LIBOR v. Euro 1mth LIBOR | **0.65** | **-0.68** | **2.63** | **1.63** |
| | | | 10/20/09-11/18/09 | 11/19/09-10/01/10 | 10/20/09-11/18/09 | 11/19/09-10/01/10 |
| 11/19/2009 | ADR tax (1.5 percent) | USD 1 mth LIBOR v. BRL 1 mth | **-0.43** | **0.64** | **35.83** | **35.48** |
| | | USD 1 mth LIBOR v. Euro 1mth LIBOR | **-0.68** | **0.14** | **1.63** | **1.67** |
| | | | 11/19/09-10/01/10 | 10/04/10-10/15/10 | 11/19/09-10/01/10 | 10/04/10-10/15/10 |
| 10/4/2010 | Inflows tax (4 percent) | USD 1 mth LIBOR v. BRL 1 mth | **0.64** | **0.62** | **35.48** | **41.46** |
| | | USD 1 mth LIBOR v. Euro 1mth LIBOR | **0.14** | **-0.79** | **1.67** | **2.74** |
| | | | 10/04/10-10/15/10 | 10/18/10-01/05/11 | 10/04/10-10/15/10 | 10/18/10-01/05/11 |
| 10/18/2010 | Inflows tax (6 percent) | USD 1 mth LIBOR v. BRL 1 mth | **0.62** | **0.65** | **41.46** | **41.51** |
| | | USD 1 mth LIBOR v. Euro 1mth LIBOR | **-0.79** | **-0.68** | **2.74** | **2.97** |
| | | | 10/18/10-01/05/11 | 01/06/11-02/10/11 | 10/18/10-01/05/11 | 01/06/11-02/10/11 |
| 1/6/2011 | Reserve requirement | USD 1 mth LIBOR v. BRL 1 mth | **0.65** | **0.49** | **41.51** | **42.54** |
| | | USD 1 mth LIBOR v. Euro 1mth LIBOR | **-0.68** | **0.55** | **2.97** | **2.97** |

**Source:**
Bloomberg Terminal, accessed Feb 11, 2011.

2: Adjusted Interest Rate Differentials

**Summary Table: Adjusted Interest Rate Differentials**

| Capital Control | | Interest Rates | Average Interest Rate Differential | |
|---|---|---|---|---|
| Date | Measures | (adj forward discount) | Before | After |
| | | **Taiwan** | 01/02/09-11/09/09 | 11/10/09-12/20/10 |
| 11/10/2009 | Controls on inflows | USD 1 wk LIBOR v. Taibor 1 wk Rate | **0.08** | **0.01** |
| | | | 11/10/09-12/20/10 | 12/21/10-12/29/10 |
| 12/21/2010 | Currency controls | USD 1 wk LIBOR v. Taibor 1 wk Rate | **0.01** | **0.05** |
| | | | 12/21/10-12/29/10 | 12/30/10-02/10/11 |
| 12/30/2010 | Reserve requirements | USD 1 wk LIBOR v. Taibor 1 wk Rate | **0.05** | **0.16** |
| | | **South Korea** | 01/02/09-06/30/10 | 07/01/10-12/17/10 |
| 7/1/2010 | Currency controls<br>End use limitations | USD 1 mth LIBOR v. Koribor 1 mth rate | **1.17** | **0.48** |
| | | | 07/01/10-12/17/10 | 12/19/10-02/10/11 |
| 12/19/2010 | Outflows tax | USD 1 mth LIBOR v. Koribor 1 mth rate | **0.48** | **0.20** |
| | | **Brazil** | 01/02/09-10/19/09 | 10/20/09-11/18/09 |
| 10/20/2009 | Inflows tax (2 percent) | USD 1 mth LIBOR v. BRL 1 mth | **6.39** | **5.87** |
| | | | 10/20/09-11/18/09 | 11/19/09-10/01/10 |
| 11/19/2009 | ADR tax (1.5 percent) | USD 1 mth LIBOR v. BRL 1 mth | **5.87** | **5.22** |
| | | | 11/19/09-10/01/10 | 10/04/10-10/15/10 |
| 10/4/2010 | Inflows tax (4 percent) | USD 1 mth LIBOR v. BRL 1 mth | **5.19** | **5.18** |
| | | | 10/04/10-10/15/10 | 10/18/10-01/05/11 |
| 10/18/2010 | Inflows tax (6 percent) | USD 1 mth LIBOR v. BRL 1 mth | **5.18** | **6.48** |
| | | | 10/18/10-01/05/11 | 01/06/11-02/10/11 |
| 1/6/2011 | Reserve requirement | USD 1 mth LIBOR v. BRL 1 mth | **6.64** | **9.69** |

*Source: Bloomberg Terminal, February 11, 2011*

## 3. Currency Analysis

**Summary Table: Currency Appreciation**

| Capital Control | | | Level of appreciation | | Rate of appreciation | |
|---|---|---|---|---|---|---|
| Date | Capital Control | Exchange Rate | Before | After | Before | After |
| | | **TAIWAN** | 01/01/09-11/09/09 | 11/10/09-12/20/10 | 01/01/09-11/09/09 | 11/10/09-12/20/10 |
| 11/10/2009 | Controls on inflows | Taiwanese Dollar/USD | **1.54793%** | **7.61811%** | **0.00638%** | **0.02656%** |
| | | | 11/10/09-12/20/10 | 12/21/10-12/29/10 | 11/10/09-12/20/10 | 12/21/10-12/29/10 |
| 12/21/2010 | Currency controls | Taiwanese Dollar/USD | **7.61811%** | **1.74029%** | **0.02656%** | **0.25019%** |
| | | | 12/21/10-12/29/10 | 12/30/10-02/10/11 | 12/21/10-12/29/10 | 12/30/10-02/10/11 |
| 12/30/2010 | Reserve requirements | Taiwanese Dollar/USD | **1.74029%** | **0.72041%** | **0.25019%** | **0.04609%** |
| | | **SOUTH KOREA** | 01/01/09-06/30/10 | 07/01/10-12/17/10 | 01/01/09-06/30/10 | 07/01/10-12/17/10 |
| 7/1/2010 | Currency controls<br>End use limitations | Korean Won/USD | **3.81882%** | **5.50630%** | **0.00411%** | **0.03626%** |
| | | | 07/01/10-12/17/10 | 12/19/10-01/14/11 | 07/01/10-12/17/10 | 12/19/10-02/10/11 |
| 12/19/2010 | Outflows tax | Korean Won/USD | **5.50630%** | **2.92947%** | **0.03626%** | **0.07456%** |
| | | **BRAZIL** | 01/01/09-10/19/09 | 10/20/09-11/18/09 | 01/01/09-10/19/09 | 10/20/09-11/18/09 |
| 10/20/2009 | Inflows tax (2 percent) | Brazilian Real/USD | **26.70213%** | **-0.29800%** | **0.14178%** | **-0.02717%** |
| | | | 10/20/09-11/18/09 | 11/19/09-10/01/10 | 10/20/09-11/18/09 | 11/19/09-10/01/10 |
| 11/19/2009 | ADR tax (1.5 percent) | Brazilian Real/USD | **-0.29800%** | **2.19507%** | **-0.02717%** | **0.00324%** |
| | | | 11/19/09-10/01/10 | 10/04/10-10/15/10 | 11/19/09-10/01/10 | 10/04/10-10/15/10 |
| 10/4/2010 | Inflows tax (4 percent) | Brazilian Real/USD | **2.19507%** | **1.76352%** | **0.00324%** | **0.16907%** |
| | | | 10/04/10-10/15/10 | 10/18/10-01/05/11 | 10/04/10-10/15/10 | 10/18/10-01/05/11 |
| 10/18/2010 | Inflows tax (6 percent) | Brazilian Real/USD | **1.76352%** | **0.31214%** | **0.16907%** | **-0.00510%** |
| | | | 10/18/10-01/05/11 | 01/06/11-02/10/11 | 10/18/10-01/05/11 | 01/06/11-02/10/11 |
| 1/6/2011 | Reserve requirement | Brazilian Real/USD | **0.31214%** | **1.24036%** | **-0.00510%** | **-0.00956%** |

**Source:**
Bloomberg Terminal, accessed February, 2011.

# 4. Stock Market Analysis

**Capital Controls and Asset Bubbles: Stock Market Analysis**

| ***Measure*** | ***Stock Market*** | ***Timing of Measure*** | | | |
|---|---|---|---|---|---|
| | | Before | After | Before | After |
| | **Taiwan** | **01/05/09-11/09/09** | **11/10/09-12/20/10** | **01/05/09-11/09/09** | **11/10/09-12/20/10** |
| Controls on inflows | Taiwan TWSE Index | 0.604129996 | 0.154768097 | 0.002461366 | 0.000594 |
| | East Asia Index | 0.574240546 | 0.20100815 | 0.0023485 | 0.000708 |
| | | **11/10/09-12/20/10** | **12/21/10-12/29/10** | **11/10/09-12/20/10** | **12/21/10-12/29/10** |
| Currency controls | Taiwan TWSE Index | 0.154768097 | 0.004368024 | 0.00059439 | 0.00159 |
| | East Asia Index | 0.20100815 | 0.008720538 | 0.000708434 | 0.002597 |
| | | **12/21/10-12/29/10** | **12/30/10-02/10/11** | **12/21/10-12/29/10** | **12/30/10-02/10/11** |
| Reserve requirements | Taiwan TWSE Index | 0.004368024 | -0.008009735 | 0.00158992 | -0.0001 |
| | East Asia Index | 0.008720538 | -0.039157906 | 0.002597241 | -0.00099 |
| | **South Korea** | **01/05/09-06/30/10** | **07/01/10-12/17/10** | **01/05/09-06/30/10** | **07/01/10-12/17/10** |
| Currency controls End use limitatio | Korean Stock Exchange Index | 0.44711436 | 0.201667616 | 0.001122463 | 0.001517 |
| | East Asia Index | 0.577960322 | 0.218288208 | 0.00138395 | 0.001578 |
| | | **07/01/10-12/17/10** | **12/19/10-01/14/11** | **07/01/10-12/17/10** | **12/19/10-02/10/11** |
| Outflows tax | Korean Stock Exchange Index | 0.201667616 | -0.005830875 | 0.001517216 | -0.00022 |
| | East Asia Index | 0.218288208 | -0.013599695 | 0.001577944 | -0.00043 |
| | **Brazil** | **01/05/09-10/19/09** | **10/20/09-11/18/09** | **01/05/09-10/19/09** | **10/20/09-11/18/09** |
| Inflows tax (2 percent) | Brazilian Bovespa Index | 0.619499588 | 0.018567981 | 0.002800531 | -0.00022 |
| | Latin America Index | 0.822787226 | 0.032884825 | 0.003321825 | 0.000264 |
| | | **10/20/09-11/18/09** | **11/19/09-10/01/10** | **10/20/09-11/18/09** | **11/19/09-10/01/10** |
| ADR tax (1.5 percent) | Brazilian Bovespa Index | 0.018567981 | 0.058830548 | -0.000218506 | 0.00034 |
| | Latin America Index | 0.032884825 | 0.119736014 | 0.000263943 | 0.00053 |
| | | **11/19/09-10/01/10** | **10/04/10-10/15/10** | **11/19/09-10/01/10** | **10/04/10-10/15/10** |
| Inflows tax (4 percent) | Brazilian Bovespa Index | 0.058830548 | 0.020533628 | 0.000339633 | 0.002539 |
| | Latin America Index | 0.119736014 | 0.032699262 | 0.00052956 | 0.003274 |
| | | **10/04/10-10/15/10** | **10/18/10-01/05/11** | **10/04/10-10/15/10** | **10/18/10-01/05/11** |
| Inflows tax (6 percent) | Brazilian Bovespa Index | 0.020533628 | -0.00898439 | 0.002539092 | -0.00013 |
| | Latin America Index | 0.032699262 | 0.025456246 | 0.003274334 | 0.000546 |
| | | **10/18/10-01/05/11** | **01/06/11-02/10/11** | **10/18/10-01/05/11** | **01/06/11-02/10/11** |
| Reserve requirement | Brazilian Bovespa Index | -0.00898439 | -0.085025498 | -0.000129289 | -0.00378 |
| | Latin America Index | 0.025456246 | -0.06274831 | 0.000545913 | -0.00306 |

*Author's analysis based on Bloomberg 2011*