Capital Controls and 21st Century Financial Crises: Evidence from Colombia and Thailand

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Abstract

In the run up to the financial crisis of 2007-2009 many developing nations fell victim to massive inflows of capital, capital that their financial systems found difficult to absorb. One of a number of policy options to respond to such inflows is unremunerated reserve requirements (URR). Two countries, Colombia and Thailand, deployed URR in the second half of the decade. This paper analyses the extent to which those URRs were successful in reducing the overall level and composition of capital inflows, reducing exchange rate appreciation and volatility, stemming asset bubbles, and granting more independence for monetary policy. We find that URRs were modestly successful in Colombia and Thailand, though Thailand was less of a success than Colombia. In Colombia the controls were able to reduce the overall volume of inflows and stem asset bubbles. In Thailand, the URR did reduce the overall volume of flows, and the announcement of the URR caused a sharp drop in asset prices. However, in both cases the controls were linked to exchange rate volatility and in Thailand asset prices recovered their upward trend the day after the announcement. The results in this paper demonstrate that on the there is still a role for capital controls in the 21st century, but such controls should be more sophisticated than in years past.

1 – Introduction

The experience of nearly a decade of crises, from the 1994 Mexican Tequila Crisis, the Asian Crisis in 1997, and Argentina 2001-2002, sparked a heated discussion regarding the need for prudential measures to manage capital markets in developing countries. This discussion has only intensified in the wake of the current crisis. The unmistakable cycle of boom and bust experienced by several emerging economies raises the question of how to deal with capital inflows during booms, and how to avoid sudden and rapid outflows during downturns. Fuelled by cheap credit in the developed world, risk appetite among investors and a booming commodities market, developing countries experienced very large capital inflows between 2005 and 2007. Most of these countries dealt with this unprecedented level of inflows by purchasing

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foreign currency in the exchange market, and accumulating large amounts of foreign reserves. These exchange market interventions were often insufficient to curb the negative consequences of excess inflows, and a few countries resorted to temporary capital controls. In this paper, we attempt to investigate the experience of two countries that imposed unremunerated reserve requirements (URR) on capital inflows during the boom, Colombia and Thailand. Specifically, we ask the following question: were the capital controls in Colombia and Thailand effective in (1) reducing capital inflows, (2) changing the composition of inflows from "hot money" towards foreign direct investment (FDI), (3) stemming an assets bubble, (4) curbing the appreciation and volatility of the exchange rate, and (5) allowing more independent monetary policy?

It is important to understand the complexities surrounding prudential measures to manage capital markets in the 21st Century. First, it is important to understand the utility of measures in order to prevent the next crisis. Second, it is just as important because developing countries will experience massive swings in capital in the aftermath of the current crisis. The developed world will maintain relatively low interest rates as a measure of expansionary monetary policy. The developing world will not sustain rates that low. Thus there will be carry trade incentives for short-term capital to flow to developing countries. This has already been the case in Brazil, which saw a massive upswing in inflows in 2009, so much so that its currency appreciated over 30 percent on the dollar . As a response to these trends, Brazil imposed a temporary tax on inflows of short-term capital. Other countries, such as Taiwan and Ecuador have also experimented with similar capital controls. More are likely to follow.

2 – Rationale

Advocates for capital market liberalization believed that, by liberalizing the flows of international capital, developing countries would benefit by getting access to cheaper credit from developed markets, promoting growth and stability. That view, based on the assumption of perfect capital markets, has been largely discredited with the recent experiences of currency crises (Ocampo, Spiegel, and Stiglitz 2008). International capital flows tend to be pro-cyclical, creating excess inflows during booms, and causing capital flight in moments of instability, further aggravating crises. Moreover, it has been shown 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).

Ocampo, Spiegel and Stiglitz (2008) argue that capital controls: can be used to stabilize short-term volatile capital flows; 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.

There literature on capital controls generally discusses at least six core reasons why nations may want to deploy them. In a comprehensive assessment of the literature, Magud and Reinhart (2006) argue capital controls are often imposed based on four underlying fears: (1) fear of appreciation, (2) fear of hot-money, (3) fear of large-inflows and (4) fear of loss of monetary autonomy.

1 – **Fear of appreciation**: capital inflows cause upward pressure on the value of the domestic currency, making domestic producers less competitive in the international market, hurting exports and therefore the economy.

2 – **Fear of "hot money":** the large injection of money into a small economy may cause distortions, and eventually a sudden reversion if foreign investors try to leave simultaneously.

3 – **Fear of large inflows:** large volumes of capital inflows, even if not all hot money, can cause dislocations in the financial system.

4 – **Fear of loss of monetary autonomy**: a trinity is always at work: it is not possible to have a fixed (or highly managed) exchange rate, monetary policy autonomy, and open capital markets. Specifically, when central banks intervene in the exchange market buying foreign currency in order to curb the appreciation of the exchange rate, they effectively increase the domestic monetary base. Trying to raise interest rates to offset that effect causes more capital inflows, as foreign investors rush in to take advantage of higher yields.

A fifth one, raised by Ocampo and Palma (2008), is the **fear of asset bubbles**[2]. This is a particularly important issue in the 2008 financial crisis, since the bursting of the real state bubble was the root cause of the banking crisis around the globe.

A sixth "fear" is the **fear of capital "flight"** whereby capital may rapidly leave a nation in the event of a crisis or because of contagion (Grabel 2003; Epstein 2005).

We structure our investigation on the effects of capital flows around the first five fears, as explained in section 4, data and methodology. URRs are designed to manage capital inflows. Thus the sixth fear of capital flight (outflows) is not analyzed here.

3 – Literature Review

The literature on the effectiveness of capital controls is too vast to cover here. However, Magud and Reinhart (2006) conduct the most comprehensive and unique assessment of the literature to 2006. In their analysis they express concern over the lack of a unified theoretical framework to analyse the macroeconomic consequences of the controls, the heterogeneity of

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[2] Magud and Reinhart mention asset bubbles as one of the possible negative consequences under "fear of large inflows." Given the importance of this issue, we decided to investigate asset bubbles separately.

countries and control measures, the multiplicity of policy goals and what constitutes "success," and the strong bias of studies to investigate a few country cases (mainly Chile and Malaysia) are some factors that contribute to the difficulty in making generalized conclusions from the literature in the field. Theirs is the most valiant attempt to overcome these shortcomings. What's more, the authors also "weight" the findings in the literature with respect to their econometric rigor. In this section then, we summarize the main findings of Magud and Reinhart and discuss the results of some recent work since that pathbreaking assessment.

Magud and Reinhart (2006) analyze studies on controls on inflows and outflows, as well as multicountry studies separately. In order to account for the multiplicity of policy goals, they narrow policy objectives to "four fears" mentioned in the previous section. Namely, they ask whether the controls were able to (1) reduce the volume of net capital outflows, (2) alter the composition of flows, (3) reduce real exchange rate pressures and (4) make monetary policy more independent. Appendix 1 reproduces the authors' analysis of the literature of controls on capital inflows.

Magud and Reinhart (2006) also address the issue of methodological heterogeneity by evaluating the methodological rigor of each of the studies. Specifically, the authors give a weight of 0.1 if they find the rigor to be "low", which are studies that consist mainly of descriptive analysis of events and/or time series. Studies with rigor ranked "intermediate," which received weight of 0.5, are those that draw conclusions from a more formal evaluation of events, but still lack a formal hypothesis testing. Finally, studies that have highly developed econometric techniques, with well defined hypothesis testing, were ranked "high" and received a weight of 1. Those weights were used to create a "weighted capital controls effectiveness index" and compared against an unweighted "capital controls effectiveness index". The authors conclude that "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." They did not find enough evidence, however, supporting that capital controls on inflows reduce the volume of net flows. Their analysis of studies on outflows is beyond the scope of this paper but their conclusions are also less clear. Table 3.1 reproduces their findings by country and type of study.

Table 3.1 – Magud and Reinhart (2006) summary of results by country and multicountry studies

Study:	Did Capital Controls:			
	Reduce the volume of net capital inflows?	Alter the composition of flows?	Reduce real exchange rate pressures?	Make monetary policy more independent?
Complete Sample	Unclear	Yes	Unclear	Yes
Control 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
Control on Outflows				
Malaysia (1998)			Unclear	Yes
Spain	Unclear		Unclear	Unclear
Thailand	Yes		Yes	Yes
Multi-country studies	Yes	Yes	Yes	No

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

There have been a small handful of relevant studies since those examined by Magud and Reinhart. Binici, Hutchison and Schindler (2009) use a panel data set of capital controls developed by Schindler (2009) to investigate the level and composition of inflows. The data set covers 74 countries during 1995-2005 and is disaggregated by asset class and by inflows/outflows. They find that countries do not seem able to effectively stem inflows by legal restrictions, but once capital is in the country governments seem better able to discourage outflows in all categories, potentially making the country less vulnerable to sudden reversals in capital flows. They also find that direct effects of restrictions on debt and equity outflows do not induce attempts to circumvent the controls by substituting into other types of capital flows, therefore, it is also effective in changing the composition.

An important drawback of the paper mentioned above is that it does not cover the experience of countries that enacted capital controls in the most recent cycle of boom and crisis (2005-2008). There were at least three countries that enacted capital controls to curb the large inflows and appreciation of the exchange rates during this time period: Colombia, Thailand and India. We were able to find two papers that evaluate the most recent Colombian experience and one that addresses India's capital controls, but to our knowledge there has been no studies published on the capital controls effective in Thailand between December 2006 and March 2008.

Balin (2008) investigates the capital controls enacted in India, starting in mid-2007, with the goals of reducing the volume of capital inflows, ending the appreciation of the Rupee, discouraging further portfolio inflows, increasing the maturity of debt inflows, and reducing volatility, turnover and speculation on the Mumbai exchange. The author concludes that the new policies did little to achieve its goals, for two reasons. First, several of the goals of India's controls were unattainable, according to the empirical literature reviewed by Balin (2008). Secondly, India's capital controls made very little impact in the *de facto* situation experienced by the Indian economy, that is, investors were able to circumvent the capital controls. The only "success" of India's experience was the improvement of the maturity profile of its external commercial debt, although the author calls it debatable. India's capital controls also seemed to have had negative consequences, helping spur corruption and favoritism within India's Reserve

Bank and Securities and Exchange Board, and raising the regulatory and capital-raising costs of small and medium-sized businesses, tilting the business climate in India in favor of larger, more influential corporations.

The recent Colombian experience was investigated by Concha and Galindo (2009) and Clements and Kamil (2009). The first study uses a time period of 1998-2008, which includes, in part, the URR effective between 1993-2000, whereas the latter addresses the 2007-2008 URRs only. Although the time period used in the two studies is slightly different, their results are largely the same. Both studies conclude that the capital controls in Colombia were not effective in reducing overall capital flows or in curbing the appreciation of the Colombian Peso. Moreover, Clements and Kamil (2009) find that the controls did reduce external borrowing, but did not increase the independence of monetary policy, questions that were not addressed by Concha and Galindo (2009). The striking difference between the results of the two papers is that Concha and Galindo (2009) conclude that the controls decreased the volatility of the exchange rate, whereas Clements and Kamil (2009) find that the controls increased its volatility. This is particularly surprising considering the both studies use a similar GARCH model specification to investigate the volatility of the exchange rate.

Finally, Jittrapanun(2009) creates a capital control index that measures the strength of capital controls in Thailand during the period from 2005 to 2007 on a daily basis allows the author to measure the impacts on a short term basis. The author found "capital controls, through direct restrictions on portfolio inflows, do cause portfolio inflows to decline, with the greatest effect in the second month of the implementation. However, similar to the results from other studies, it is seen here that the restrictions' effectiveness rapidly diminishes within six months of the implementation, reflecting market adjustment to circumvent the controls."(40)

4 – Capital Controls in Colombia and Thailand

Between 2003 and 2007 developing countries lived a likely unprecedented period of economic growth. Their growth was in part the results of better macroeconomic policies, fiscal responsibility and political stability from governments that had recently endured periods of crisis. But just as important, their growth was fueled by a large inflow of capital from developed economies, as investors took advantage of cheap credit in search of larger returns in the developing world. The booming commodities market was also a large contributor to the flow of capital towards countries that are commodity producers.

The large inflow of money also had negative consequences. Exchange rates soared, making domestic exporters less competitive internationally. Since the recent experience of currency crises was still fresh in policy makers' minds, the fear of a sharp reversal was also a concern. Most developing countries reacted by intervening in the exchange market, purchasing foreign currency and accumulating large amounts of foreign reserves. Those interventions, however, were often insufficient to curb the appreciation of the domestic currency. When the

financial crisis struck the developed world in 2008, the flow reversed and capital fled from developing countries to safer investments in developed economies. Table 4.1 shows the 15 countries that experienced the largest positive changes in the financial account between 2002 and 2007. Most of those countries, especially the developing ones, experienced a strong reversal between 2007 and 2008. That trend is reflected in their real effective exchange rates.

Table 4.1 – Changes in net financial account as % of 2007 GDP

Country	Total 2002 - 2007 Change as % of 2007 GDP	Total 2007 - 2008 Change as % of 2007 GDP	REER* Change Jan/2002- Dec/2007	REER* Change Dec/2007- Dec/2008	
Romania	30.4%	-4.1%	29.7%	-5.0%	
Argentina	18.6%	-12.9%	-55.1%	-8.4%	*
Greece	16.9%	4.0%	15.6%	1.4%	
Spain	16.8%	0.5%	17.2%	0.9%	
Poland	15.4%	1.0%	4.6%	-8.2%	
South Africa	15.1%	-5.8%	43.9%	-32.5%	
India	14.6%	-9.7%	22.6%	-18.9%	*
Russia	14.5%	-35.9%	41.9%	3.3%	
Turkey	14.4%	-4.3%	16.6%	-24.0%	*
Nigeria	14.2%	-6.2%	15.3%	13.1%	
Brazil	13.8%	-9.0%	33.2%	-25.4%	*
Ireland	10.5%	11.1%	30.5%	2.3%	
Colombia	8.7%	-0.8%	15.0%	-4.3%	
Portugal	7.5%	8.6%	10.6%	0.6%	
Philippines	4.5%	-11.4%	23.1%	-6.7%	

Notes: 45 largest economies were included in the calculations.
* REER – Real effective exchange rate when available, otherwise the nominal exchange rate $ per domestic currency was used. Countries for which the REER was not available are marked with *.
Source: authors' calculations with data from the International Financial Statistics (IMF).

Colombia

Colombia has had a long experience with capital controls. It started the liberalization of its capital markets in 1991, but some controls remained in place until 2000, including an unremunerated reserve requirement (URR) that was effective between 1993 and 2000, with the goal of stemming the appreciation of the Colombian Peso (Concha and Galindo 2009). The 1993+ URRR designated percentage of foreign loans with a maturity of less than a designated maximum be kept as a deposit in local currency, at zero interest for a certain percentage of the loan and a stated period of time (approx 47 percent for one year). Economists have shown that the URR during this period was effective in Colombia in reducing the volume of net capital inflows, improving the term structure of foreign borrowing, and granting more independence to monetary authorities. In some cases these effects were "speed bumps" however, rather than serving as full stops on inflows (Ocampo 2003).

Like most developing countries, Colombia received large inflows of foreign capital between 2005 and 2007, with a particularly sharp increase in the first quarter of 2007 (see figure

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4.1). In order to stem the appreciation of the Peso, the central bank (Banco de la Republica) intervened in the exchange market by buying foreign currency, resulting in a large accumulation of foreign reserves (see figure 4.2). The intervention did not prevent the Colombian Peso from appreciating further. Between June 28, 2006 and May 04, 2007, the Peso rose 28% against the dollar.

Figure 4.1 – Colombia's Net Capital Flows
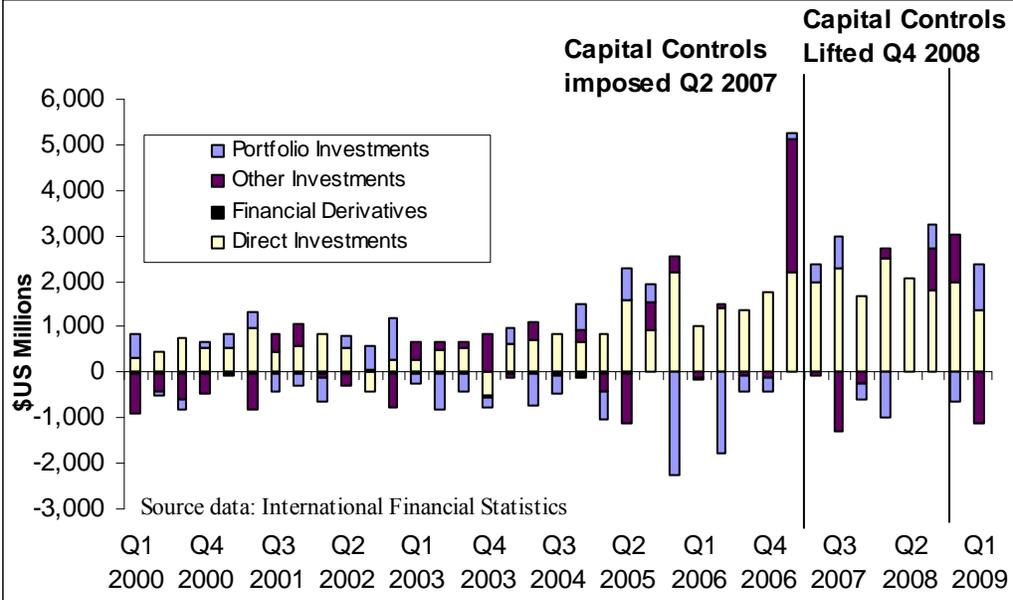
On May 07, 2007, an URR was reintroduced on most type of external borrowings. 40% of the funds were to be kept in an unremunerated account in pesos or US dollars with the Banco de la Republica for six months. Other restrictions were also imposed, including a limit of 500% of the overall gross exposure of each participant in the foreign exchange derivatives market and lower URR for other current account related credit advances. On May 23 the 40% URR requirement was extended to include all portfolio inflows by foreign investors (IMF 2008).

In addition to a URR, Colombia also deployed three other measures: limits on maturity mismatches; limits on open positions of foreign exchange of financial intermediaries; and limits on the amount of foreign currency pensions funds are able to hedge. These measures were seen to have a stabilizing role during the current crisis (Villar 2010).

Figure 4.2 – Colombia's Foreign Reserves
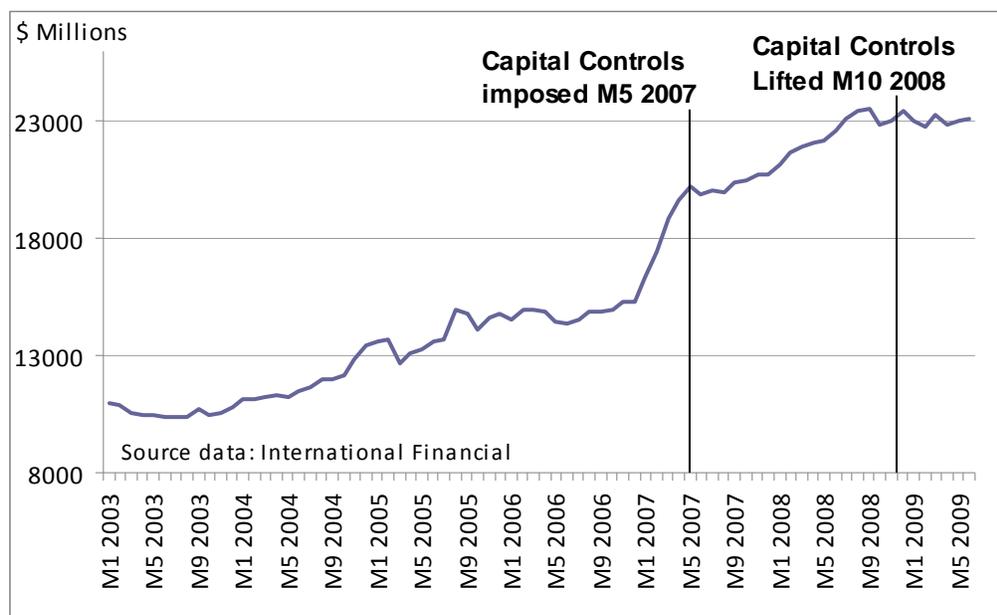
Clements and Kamil (2009) point out that excluding Colombian institutional funds from the capital controls is of particular importance, since they are highly active in the trading of the foreign exchange market. They also remark that Colombian residents and firms, also exempted from the URR requirements, accounted for three-fourths of the of portfolio inflows in the pre-controls era. In June 2007, an exemption was granted for equities issued abroad, which allowed the issuance of stock through American Depository Receipts (ADRs) controls-free.

The capital controls underwent several modifications in late 2007 and in 2008, including further exemptions for initial public offerings of equities in December 2007, an increase of the URR on portfolio inflows from 40% to 50% and a minimum stay requirement of two-years on FDI in May 2008 (for further details, see Clements and Kamil 2009; IMF 2008).

The collapse of Lehman Brothers on September 15, 2008 and the subsequent aggravation of the financial crisis in the United States reversed the trend of capital as investors rushed to safer assets in the developed world. Between mid-June and early October 2008, the Colombian Peso fell almost 30% against the U.S. dollar. On October 09, 2008 the Colombian government announced that the URR as well as the two-year minimum stay requirement on FDI were being lifted.

Thailand

      With fresh memories of the capital inflow boom that ended with the Asian crisis in 1997, the Bank of Thailand (BOT) was swift to counteract the large appreciation of the Thai Baht in 2006. When capital market interventions did not curb the rise of the Baht as foreign reserves soared (see figure 4.3), the BOT started reversing a long trend of capital market deregulation on December 4th, instructing financial institutions to refrain from several types of foreign exchange market activities with the goal of stemming speculation (Economist Inteligence Unit 2006).

Figure 4.3 – Thailand's Foreign Reserves
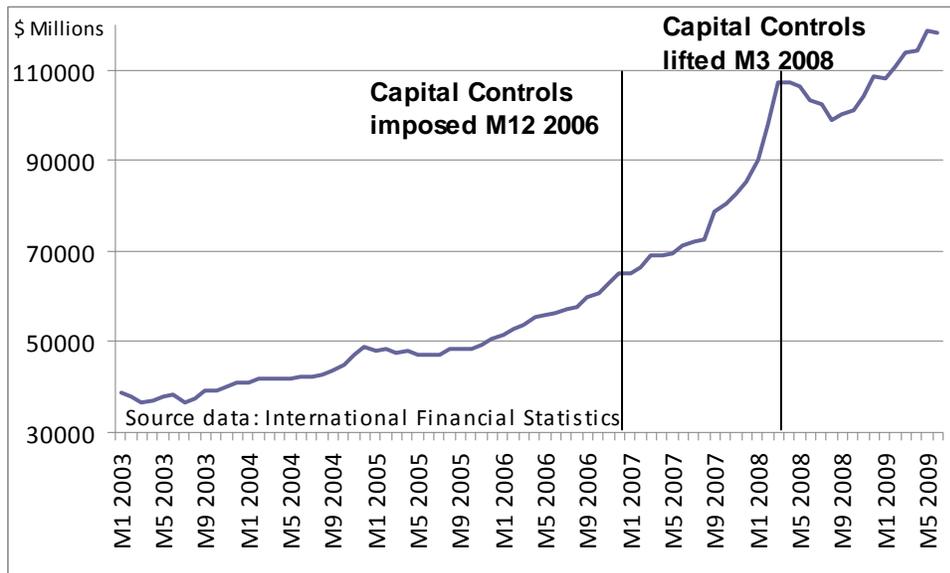
      Thailand's BOT introduced a number of measures to stem capital inflows in November and December of 2006. In November, the BOT prohibited financial institutions from issuing and selling means of exchange in Thailand to non-residents. On 6 December 2006, the BOT prohibited the sale or purchase of all debt securities (Jittrapanun 2009). The Thai Baht continued rising and on December 18, 2006, the BOT imposed an URR of 30% on most types of capital inflows, excluding FDI and amounts not exceeding $20,000. A full refund of the principal would be given if the funds remained in Thailand for at least one year, otherwise, two-thirds of the principal would be returned, after BOT approval (IMF 2007). The announcement hit the stock market hard, with the Bangkok SET index plunging almost 15%. The following day, the BOT announced that foreign investment in stocks would be exempted from the URR, and the market recovered most of its previous days loses (Economist Inteligence Unit 2006).

      In 2007, several changes were made to Thailand's newly introduced capital controls, and a number of other transactions became exempt from the URR requirement (IMF 2008). By the beginning of 2008, when credit was becoming increasing tight in the developed countries, the pressure on the Thai Baht to appreciate disappeared. In the beginning of February, the BOT

raised limits for several capital account transactions and on March 03 it lifted the URR altogether.

5 – Data and Methodology

We draw on the recent literature to develop models that test the use of URRs in Colombia and Thailand in allaying each of the "five fears" of capital flows discussed above. In so doing, and to avoid controversy, we only deploy techniques considered "high" in the Magud-Reinhart methodological rankings. Indeed, we draw on these methods and make innovations to the models by examining the time bound effects of various controls used, by deploying monthly dummies when the controls came in effect and interacting these dummies with other independent variables.

Our models attempt to assess the effectiveness of the capital controls in pursuing the following five policy goals:

1- reducing excessive net inflows;
2- reducing inflows of hot money while preserving inflows of FDI;
3- avoiding possible asset price bubbles;
4- curbing the appreciation and volatility of the exchange rate;
5- increasing monetary autonomy (this question is embedded in model 4).

The first two models are run on a quarterly basis, from Q1 2000 to Q4 2008 (36 quarters). All other models use daily data from 2003 to August 2009. We use quarterly balance of payment data from the International Financial Statistics (IMF). GDP data are taken from the World Development Indicators (World Bank). All other data were taken from Datastream (Thomson).

We use panel data with fixed effects estimates in models 1 and 2 in order to account for the trend of capital flows from developed to developing countries during the time investigated. In model 3, we use OLS with heteroskedasticity robust standard errors. Equation 4, which address policy questions 4 and 5, use a Generalized Autorregressive Conditional Heteroskedasticity (GARCH) approach, which estimates, through log likelihood, the effect of the capital controls on both the level and the volatility of the exchange rate.

1 – Total Net Capital Flows

We use panel data models with fixed effects estimates to investigate the impact of the controls on the overall levels of capital flows. The first panel contains 10 South American

countries and the second 11 East Asian countries for which data was available (Japan was excluded).

$$F_{it} = \beta_1 \, CurAcc_{it} + \beta_2 \, C_i + \beta_3 \, Q_t + \beta_4 \, Controls_{it} + \varepsilon_t$$

Where:

F   – Total net capital flows as percentage of GDP.
CurAcc – Current Account balance as percentage of GDP. Most other authors have found the current account to be an important determined of capital flows, for example DeGregorio et al. (2000). As the authors point out, ultimately it is excess expenditure that drives capital movements.
C   - Country-specific fixed effects[3].
Q   - Time (quarter-specific) effects. This variable capures not only the overall trend of capital flows, but also any unobservable effects that alter the level of capital flows to the countries in the dataset, for example, the macroeconomic environment in the developed world.
Controls – Capital controls dummy. In general, the quarter was included if the capital controls were effective during more than half of the quarter. The capital controls dummy for Colombia covers 2Q07 to 3Q08, and the one for Thailand covers 1Q07 to 4Q07. Although the URR in Thailand was not completely lifted until March 3, 2008, the BOT relaxed several requirements on February 04 of that year. There were also a very large inflows in March 08, after the URR was lifted, according to monthly Balance of Payments data from the BOT[4], therefore including the quarter in the controls period would result in inaccurate estimates.

2 – Composition of Capital Flows:

We investigate whether the capital controls affected the FDI and non-FDI inflows differently. We run the similar models to the one explained above, but using FDI and non-FDI as dependent variables. This method was used, for exemple, in Cardoso and Goldfajn (2007),

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[3] This variable is very powerful in the sense that it captures the effect of any omitted variables that differ across countries and is relatively stable during the time period investigated. Ideally, however, we should include any country-specific variables that vary across time. This was not always possible. One such variable is the spread between domestic and international interest rates, which is included in most models of international capital flows. In the context of our panel data, we would need to use comparable measures of interest rates across countries, which were not available, therefore that variable was omitted. However, as long as interest rate spreads changed relatively uniformly in different countries across the time period investigated, which we believe is the case, that change would be captured by the time dummies.

[4] http://www.bot.or.th/English/Statistics/EconomicAndFinancial/ExternalSector/Pages/ StatBalanceofPayments.aspx

Gallengo, Hernandez and Schmidt-Hebbel (1999) and Valdez-Prieto and Soto (2000). In addition, we run the model subtracting FDI flows from non-FDI flows in order to test whether the coefficient for the Capital Controls Dummy is the same in both cases:

$$(FnonFDI_{it} - FDI_{it}) = \gamma_1 \, CurAcc_{it} + \gamma_2 \, C_i + \gamma_3 \, Q_t + \gamma_4 \, Controls_{it} + \varepsilon_t$$

Where each γ coefficient is equivalent to: $\beta_{nf} - \beta_{fdi}$. A negative coefficient for the Controls dummy indicates that the capital controls decreased non-FDI inflows more than FDI inflows, as we expect. Similarly, the t-test on γ_4 ($H_0 = 0$) tells us if the difference is statistically significant.

3 – Asset Prices:

We used stock market indices as a proxy for asset prices, that was done, for example, by Ocampo and Palma (2008). Our model, estimated using OLS, is the following:

$$\Delta Stock_t = \beta_0 + \beta_1 \, \Delta Index_t + \beta_2 \, Announce_t + \beta_3 \, Controls_t + \beta_4 \, Controls_t * \Delta Index_t + \beta_5 \, PostControls_t + \beta_6 \, PostControls_t * \Delta Index_t + \varepsilon_t$$

Where:

$\Delta Stock$ – Domestic stock market index (in log change). For Colombia we used the IGBC index, for Thailand the MAI, for India the SENSEX and for Brazil the Bovespa. Our data starts in September 2003, which is the earliest available for the Thailand MAI index. For Brazil, the data go from 01/01/2009 to 11/11/2009.

$\Delta Index$ – Regional stock market index (in log change). We use the "FTSE Emerging Latin America Index" for Brazil and Colombia and the "FTSE Asia Pacific excl. Japan, India, Pakistan, New Zealand and Australia" for India and Thailand.[5]

Announce – Dummy for the day of the announcement that capital controls would be introduced, or the first trading day if the announcement was made on the weekend or after market hours. We expect the stock market to fall in response to the announcement. For the case of Thailand, we use two dummies, one for December 19, 2006, the first trading day after the announcement, and another for the following day, when the BOT reversed part of its decision and exempted equity investments from the URR.

Controls – Capital controls dummy, for the time the URR was in effect each country. We expect a negative coefficient, indicating that the controls cooled the stock market rise.

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[5] Ideally, we would use indices that exclude the country investigated to avoid endogeneity, but unfortunately regional indices excluding Colombia and Thailand were not available. However, considering the small size of their economies compared to Latin America and Asia respectively, the endogeneity was likely small and would not affect the results.

Controls * ΔIndex – We multiply the dummy by the regional index, as a measure for international independence. We expect a negative coefficient, indicating that the capital controls made the domestic stock market more independent of movements in international markets.

In order to investigate whether the controls had any lasting effects on the stock market, we introduce dummies for the three months following the date the controls were lifted:

Postcontrols – Dummy for 3-month period after controls were lifted.
Postcontrols * ΔIndex – Measure for international independence after controls were lifted.

4 – Exchange Rates and Monetary Autonomy

Our model 4 analyzes both the effect of the controls on exchange rate and on monetary autonomy. This model is similar to the one used by Edwards and Rigobon (2009) to investigate the Chilean capital controls, and we use the method used by Clements and Kamil (2009) to assess whether the capital controls were successful in increasing monetary autonomy. We use a GARCH (1,1) specification to capture the effect of the controls on both the level and volatility of the exchange rates:

$$\Delta R_t = \beta_0 + \beta_1 \Delta Int_t + \beta_2 \Delta USInt_t + \beta_3 \Delta EMBI_t + \beta_4 \Delta TOT_t + \beta_5 CBInt_t + \beta_6 Controls_t + \beta_7 Controls_t * \Delta Int_t + \varepsilon_t$$

$$\varepsilon_t \sim N(0, \sigma_t^2)$$

$$\sigma_t^2 = \eta_0 + \eta_1 \varepsilon_{t-1} + \eta_2 \sigma_{t-1}^2 + \eta_3 \Delta Int_t + \eta_4 \Delta USInt_t + \eta_5 \Delta EMBI_t + \eta_6 \Delta TOT_t + \eta_7 CBInt_t + \eta_8 Controls_t + v_t$$

Where:

ΔR – Nominal Exchange Rate US Dollar per domestic currency, so that an increase indicates an appreciation. We use log changes.

ΔInt – Change in domestic overnight interbank lending rates. An increase in domestic interest rates is expected to appreciate the domestic currency.

$\Delta USInt$ – Change in the US overnight interbank rates. We expect a negative coefficient for the US rate.

$\Delta EMBI$ – Change in JP Morgan EMBI Global Spread, country-specific for Colombia, and Asia for Thailand due to data availability. We expect an increase in the EMBI to decrease the domestic currency.

ΔTOT – Proxy for terms of trade: price of the largest trade item in value for each country (in log change). Oil is the largest trade item for both Colombia and Thailand, the first as an exporter, the second as an importer, according to COMTRADE. We expect an increase

in the price of oil to increase the value of the Colombian Peso, but to decrease the value of the Thai Baht.

CBInt – Central bank intervention in the foreign exchange market. This variable is only available for Thailand.

Controls – Capital controls dummy

Controls$_t * \Delta$Int$_t$ – We interact the capital controls dummy with the changes in interest rates in order to the capture any increase in monetary independence. If the controls increased monetary independence, the Central Bank should be able to increase interest rates without causing the appreciation of the exchange rate (or, at least, decreasing the effect). This is the method used by Clements and Kamil (2009). Other authors also use interest rates as a measure of monetary independence, including Gallengo, Hernandez and Schmidt-Hebbel (1999), Laurens and Cardoso (1998), Edison and Reinhart (2001) and DeGregorio et al. (2000).

An innovation: Measuring the Temporary Effect of Capital Controls

Many authors have indicated that the effects of capital controls tend to be temporary, including Edwards and Rigobon (2009), Cardoso and Goldfajn (2007) and DeGregorio et al. (2000). In order to account for a temporary effect, we introduce alternative capital control dummies in the three models that use daily data. We create one dummy for each of the 4 months after the capital controls were introduced and one dummy for the remaining time the controls were in effect.

6 – Results

Using these models and the best available data we find that URRs were of only a modest success in Colombia and even less so in Thailand. In both countries the URR significantly reduced the overall level of capital inflows and played some role in stemming asset bubbles. However, in both cases exchange rate volatility increased and there was no effect on monetary independence or the composition of inflows. In what follows we exhibit the results of each series of model runs.

Model 1 – Total Net Capital Flows

The results from our panel fixed effects model show that the capital controls were effective in decreasing the overall level of capital flows in Colombia by approximately 1% of GDP, when compared to other South American countries. The current account, as we expected, is also a significant determined of capital flows in the region. An increase in the current account of 1% of GDP is associated with a decrease in capital flows of approximately 0.4% of GDP.

In Thailand, our regression results show that, when compared to other East Asian countries, the capital controls imposed in December 2006 were effective in reducing overall capital flows by approximately 0.75% of GDP. This effect was marginally significant (p=0.053). This is similar to the findings of Jittrapanun (2009). The current account was also an important determinant of capital flows in the East Asian countries investigated. An increase in the current account of 1% of GDP is associated with a decrease in the net capital flows of approximately 0.6% of GDP. Detailed results are presented in Table 6.1.

Model 2 – Composition of Capital Flows

Although the capital controls were effective in reducing overall capital flows in Colombia, when we disaggregate the flows into FDI and non-FDI, the effect of the controls are not statistically significant. The results presented in Table 6.1 show coefficients with the expected direction (-0.8% and -0.1% for FDI and non-FDI respectively). The difference between the two estimated by the "non-FDI minus FDI" equation is also not significant. The current account has a significant effect on FDI flows (-0.2% of GDP), but it is not significant for non-FDI flows.

Our panel for East Asia indicates that the capital controls decreased FDI flows in Thailand by approximately 1% of GDP, but had no effect on non-FDI flows. The difference between the two estimates, however, is not statistically significant. Although the URR did not apply to FDI flows, this result is not completely surprising. The drop in FDI flows were likely an unintended consequence of the increased uncertainty generated by the new policy. Investors would likely become wary of long-term commitments. Instead, the short-term investments likely suffered less from the increased uncertainty, and considering that the Bank of Thailand exempted equity investments in listed stocks from the URR one day after the capital controls were introduced, we would expect non-FDI flows to be relatively unaffected.

Contrary to our results from South America, the current account was a strong determinant of non-FDI flows but not of FDI flows in East Asia. An increase in the current account of 1% of GDP is associated with a decrease in non-FDI flows of approximately 0.5% of GDP.

Table 6.1 – Panel FE regression results models 1 and 2 (quarterly data)

	Colombia – Number of obs: 356			
Dependent Variable:	Net Flows	Non-FDI	FDI	(Non-FDI – FDI)
Current Account	-0.395***	-0.194	-0.202***	0.008
	(0.122)	(0.121)	(0.045)	(0.135)
Controls	-0.950**	-0.835	-0.116	-0.719
	(0.404)	(0.534)	(0.311)	(0.775)
R^2	0.162	0.122	0.158	0.095

| Thailand – Number of obs: 385				
Dependent Variable:	Net Flows	Non-FDI	FDI	(Non-FDI – FDI)
Current Account	-0.594***	-0.537***	-0.057	-0.479**
	(0.093)	(0.127)	(0.103)	(0.211)
Controls	-0.759*	0.284	-1.043**	1.327
	(0.391)	(0.567)	(0.438)	(0.935)
R^2	0.286	0.190	0.155	0.159

Robust standard errors in parenthesis.

*, **, *** indicates statistically significance at the 10%, 5% and 1% levels respectively.

Model 3 – Asset Prices

Our OLS regression estimates shows that, after causing a sharp drop of about 3% in the Colombian stock market the day the capital controls became effective, they may have slightly curbed the market rise during the controls period (0.1% per day, significant at the 10% level). More interestingly, the coefficient of the variable "controls * index" indicates that the capital controls made the stock market in Colombia more independent than the regional index. Specifically, before controls, a movement in the index explained almost 50% (0.47) of the change in the Colombian stock market. During the controls, that correlation fell, and a movement of the index explained only 32% of the change in the Colombian market (0.47- 0.15 = 0.32). This is largely in line with that we observe in Figure 6.1. The Colombian stock market stopped increasing with the Latin American Index before it peaked in May 2008, but also didn't fall as sharply when the market plunged. Our monthly dummies indicate that this effect was not statistically significant in the first 4 months, but it became significant in the remaining time the URR was in effect. The coefficient estimates from the post-control period indicates that there were no lasting effects after the controls were lifted.

Figure 6.1 – Colombian Stock Market (01/01/2003 = 100)
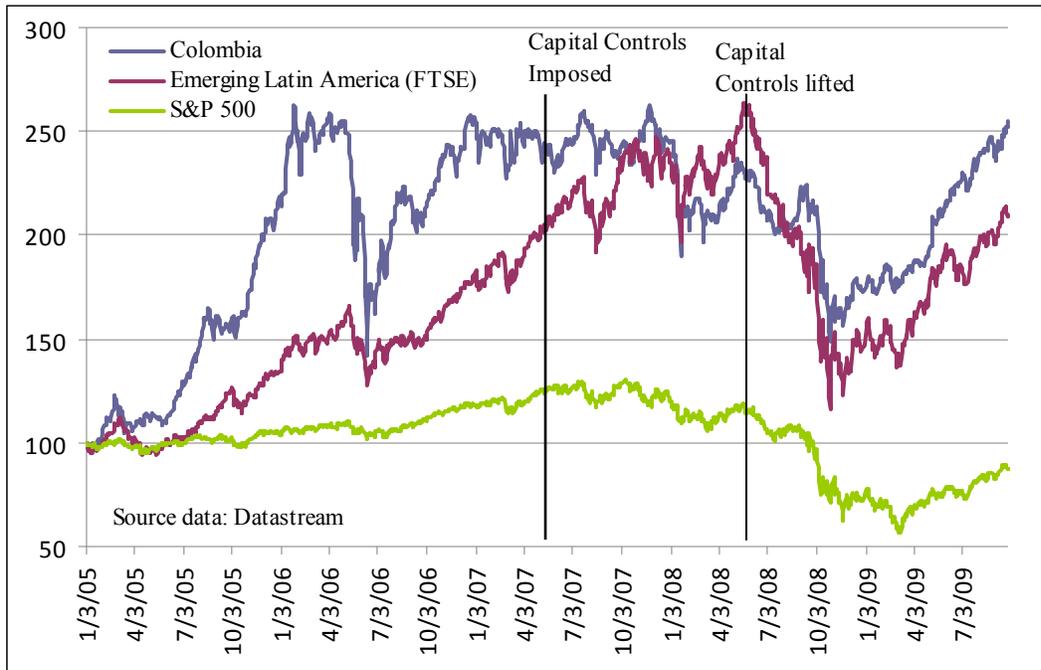
The estimates for Thailand show a very strong drop (more than 10%) in the stock market the day the capital controls became effective. However, when the Bank of Thailand decided to exempt equity investments in stocks from the URR the following day, most of that loss was reversed. During the remaining time the capital controls were in effect, our coefficient estimate of the controls dummy indicates a small but statistically significant increase in the stock market level (0.16%) this effect may indicate that the stock market slowly recovered the remaining losses suffered the day of the announcement. Our monthly dummies show that this recovery was statistically significant in the 2nd month and after the 4th month, but not during the 1st, 3rd and 4th months. As with Colombia, there were no lasting effects during the post-controls period. Table 6.2 presents the results in detail.

Table 6.2 – OLS regression results model 3 (daily data)

Dependent Variable:	Colombia Stock Market Index (log changes)	Thailand Stock Market Index (log changes)
Δ Regional Index	0.476***	0.301***
	(0.058)	(0.031)
Announcement day	-0.030***	-0.106***
	(0.0007)	(0.0006)
Announcement day 2		0.080***
	-	(0.0008)
Controls dummy	-0.001*	0.002**
	(0.0008)	(0.0006)
Controls dummy * Index	-0.156**	-0.031
	(0.075)	(0.052)
Post-controls dummy	-0.002	0.0008
	(0.002)	(0.001)
Post-controls dummy * Index	-0.086	-0.091
	(0.087)	(0.068)
Constant	0.001**	-0.0008**
	(0.0005)	(0.0004)
R^2	0.177	0.199

Number of observations: 1550

Robust standard errors in parenthesis.

*, **, *** indicates statistically significance at the 10%, 5% and 1% levels respectively.

Model 4 – Exchange Rate and Monetary Independence

Although the primary goal of the Banco de la Republica was to curb the appreciation of the Colombian Peso, the results from our GARCH model indicate that they were largely unsuccessful. The coefficients from the mean equation show that the controls not only didn't have a consistent effect on the level of the exchange rate, but were associated with an appreciation of the Peso during the first month, as indicated by our monthly dummies. Moreover, the variance equations show that the controls increased the volatility of the exchange rate, and that effect was significant throughout the controls period. Our measure of monetary independence, the interaction of the dummy with the changes in the domestic interest rates, did not yield a significant coefficient, indicating that the controls may not brought more autonomy over the monetary policy. As we expected, an increase in the EMBI spread is associated with a decrease in the exchange rate and an increase in the price of oil is positively related to the exchange rate. The domestic and U.S. interest rates did not have a significant effect on the exchange rate. Detailed results are in table 6.3.

Table 6.3 – $/COLOMBIAN PESO – GARCH regression results model 4 (daily data)

	Baseline		Monthly Dummies	
	Mean Equation	Variance Equation	Mean Equation	Variance Equation
Δ Domestic interest rate	-0.00278*	3.300**	-0.00212	3.301***
	(0.0015)	(1.468)	(0.00143)	(1.278)
Δ US interest rate	-0.00143	-2.177***	-0.00128	-2.187***
	(0.0015)	(0.459)	(0.00149)	(0.459)
Δ EMBI spread	-0.00013***	0.0298*	-0.00013***	0.0224
	(0.00001)	(0.0158)	(0.00001)	(0.0153)
Δ Oil price	0.0177***	42.149***	0.0169***	44.479***
	(0.0046)	(4.814)	(0.0046)	(4.382)
Controls dummy	0.000535	1.458***		
	(0.00042)	(0.190)		
Controls dummy * domestic interest rate	0.00767	-0.435		
	(0.00535)	(4.950)		
Controls dummy month 1			0.0041***	2.045***
			(0.00157)	(0.738)
Controls dummy month 2			-0.00135	-184.491***
			(0.00193)	(1.624)
Controls dummy month 3			-0.00044	1.777
			(0.0020)	(1.301)
Controls dummy month 4			-0.00424	3.498***
			(0.00383)	(0.388)
Controls dummy remaining months			0.000509	1.335***
			(0.000486)	(0.199)
Constant	0.00018*	-14.701***	0.00019**	-14.68***
	(0.0001)	(0.174)	(0.0001)	(0.166)
Wald statistic	179.56***		187.57***	

Number of observations: 1738
Exchange rates in log changes.
Robust standard errors in parenthesis.
*, **, *** indicates statistically significance at the 10%, 5% and 1% levels respectively

In Thailand, the capital controls seem to have had no effect on the level of the exchange rate, but as in Colombia, it increased its volatility. Our GARCH estimates with monthly dummies confirm that the increased volatility was present throughout the controls period. Similarly to Colombia, our results show that the controls did not increase monetary autonomy in Thailand. As we expected, the Global EMBI Asia Spread is negatively related with the exchange rate level. The domestic interest rates did not yield a significant change in the exchange rate, but the U.S. rate was positively related with an appreciation of the Baht (we expected a negative

relationship). The price of oil was also related to an increase in the exchange rate, where we expected a decrease, since Thailand is an importer of oil. Table 6.4 contains the results.

Table 6.4 – $/THAI BATH – GARCH regression results model 4 (daily data)

	Baseline		Monthly Dummies	
	Mean Equation	Variance Equation	Mean Equation	Variance Equation
Δ Domestic interest rate	0.00055	0.0347	0.00050	-0.349
	(0.0006)	(1.5776)	(0.0006)	(0.999)
Δ US interest rate	0.000493	0.887***	0.000516	0.887***
	(0.00042)	(0.202)	(0.000414)	(0.202)
Δ EMBI spread	-0.00002***	-0.0175*	-0.00002***	-0.0165*
	(0.00001)	(0.00915)	(0.00001)	(0.0095)
Δ Oil price	0.00784***	5.987*	0.00791***	5.278
	(0.00286)	(3.545)	(0.00285)	(3.704)
Central Bank Intervention	-0.03511	-7.829	-0.03355	-22.777
	(0.0342)	(23.640)	(0.0349)	(24.33)
Controls dummy	-0.00053	3.108***		
	(0.00067)	(0.0939)		
Controls dummy * domestic interest rate	-0.00048	-2.0561		
	(0.00938)	(1.981)		
Controls dummy month 1			0.00104	2.301***
			(0.00213)	(0.344)
Controls dummy month 2			0.004265	2.644***
			(0.00337)	(1.019)
Controls dummy month 3			-0.00031	2.494***
			(0.00215)	(0.882)
Controls dummy month 4			0.00113	2.358***
			(0.00189)	(0.608)
Controls dummy remaining months			-0.00117	3.301***
			(0.00094)	(0.113)
Constant	0.000044	-13.3791***	0.00004	-13.3964***
	(0.00006)	(0.132)	(0.00007)	(0.132)
Wald statistic	27.59***		31.3***	

Number of observations: 1738
Exchange rates in log changes.
Robust standard errors in parenthesis.
*, **, *** indicates statistically significance at the 10%, 5% and 1% levels respectively

7. Summary and Conclusions

In this paper we sought to examine the extent to which URRs, a form of capital control on inflows of short-term capital, alleviated pressure deriving from the five fears of massive capital inflows to developing countries. Whereas the literature on controls deployed in the late 1990s and the early part of the first decade of the 21st Century were found to make monetary policy more independent, alter the composition of capital flows and reduce real exchange rate pressures, our study comes to more modest conclusions. In the case of URRs in Colombia and Thailand (see table 7.1), we find that the controls reduced total inflows, cooled asset price bubbles (albeit very temporarily in Thailand's case), and increased the volatility of the exchange rate.

Table 7.1: Summary of results.

Country	Total Inflows	Composition	Asset Prices (Stock Market)	Exchange Rate	Monetary Independence (Interest Rate)
Colombia	Decrease total inflows.	No statistically significant effect.	Some evidence that it cooled the stock market rise. Made the domestic stock market more independent from the regional index. May have avoided or reduced a bubble.	Appreciated the exchange rate (effect significant for first month). Increased volatility.	No effect.
Thailand	Decrease total inflows.	Decrease FDI, but no effect on non-FDI. Difference is statistically significant.	Sharp drop on announcement day, but recovered on the following day. No lasting effect.	No effect on level. Increased volatility.	No effect.

Why do our findings slightly deviate from previous work that finds a stronger effect of capital controls and what are the lessons for policy-making in the wake of the current financial crisis? Recent research suggests that the controls in Colombia and Thailand may not have been complex enough to stem inflows packaged in creative ways, and at least in Thailand, may not have been bold enough to significantly affect inflows.

Given that capital controls are controversial, finance ministries are often timid from the start in issuing a control so as not to cause too much of a disruption in the markets. What's more, when controls are relatively simply designed, investors often construct innovative contracts to circumvent the controls.

One of the most profound ways that controls have been circumvented 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. In our paper we find that Thailand's controls decreased FDI. Seen through the lens of Carvalho and Garcia's analyses such an effect may not be so negative.

Intermediaries have also learned to circumvent capital controls through the creation of sophisticated derivative schemes. A holdover from the 1960s, Brazil has accounts, that allow non-resident institutions to hold an account in Brazil in the national currency that make it simpler to direct funds outside Brazil. These accounts were not covered under Brazil's capital controls on inflows. It is worth quoting exactly how these accounts referred to as CC-5s, were used:

> "to bypass this tax, the market sought ways to avoid converting currency. One of these was what was called at the time a "*Blue Chip Swap*." This involved a foreign asset that the investor would transfer to the off-shore branch of a Brazilian financial institution against a CC-5 credit of the investor in Brazil. The foreign investor delivered the foreign asset and the domestic counterpart made the deposit in Brazil in the foreign agent's CC-5 account. Through the CC-5, the foreign investor had free access to the floating rate exchange market and sent the money abroad without restrictions when the operation was finalized. With this, international transactions between financial institutions bypassed the IOF tax by not officially converting currency. These operations involving unofficial currency exchange, in defiance of the Central Bank's monopoly, were known as back to back operations. The Blue Chip Swap is one example of this type of operation." (Carvalho and Garcia 2006, 27)

It is clear that from a welfare perspective the rationale for capital controls is more justified now than it ever was. Yet, based on the econometric evidence of this study and findings from economists such as Carvalho and Garcia, one could walk away with one of two conclusions. First, citing the fact that investors can circumvent controls one could argue that controls are very ineffective and therefore developing countries must learn other means of alleviating the five fears. On the other hand, one could conclude that more vigor and attention is needed in the design of particular controls, not just their justification.

When the military backed government of Thailand, instituted after a coup only three months before, imposed the URR on non-FDI capital inflows in December 2006, Bangkok's SET stop market index fell almost 15%. The government reaction, in what the Economist

Intelligence Unit calls "an abrupt and embarrassing about-face," was to reverse the requirement for equity investments in the stock market (Economist Inteligence Unit 2006). The index recovered most of its losses the following day, but the credibility of government to manage the financial system was likely severely damaged. The BOT went on to exempt several other types of transactions from the URR in the following weeks (IMF 2007), making it too weak to achieve it's goal of curbing the appreciation of the Baht.

Thailand's hesitant approach to capital controls is a large mistake in today's complex financial system. A recent study on Brazil comes to similar conclusions that we do for Colombia and Thailand (Carvalho and Garcia 2006). In a recent NBER report, Brazilian economists Bernardo Carvalho and Marcio Garcia show that Brazil's attempts to deter inflows were only effective for a brief period—from announcement to no longer than six months. To follow-up on their econometric exercises, they conduct interviews with key market players who anonymously revealed how controls were circumvented in Brazil between 1993 and 2000. Carvalho and Garcia (2006) demonstrate that capital controls are circumvented through two channels. First, investors disguise short-term investments as long-term equity or trade finance. Second, that investors design sophisticated derivative instruments to avoid controls.

Given the continued pro-cyclical nature of capital flows we urge that nations deploy all possible avenues for counter-cyclical policies, and that capital controls on inflows remain a useful tool. Indeed, it is clear that controls did indeed reduce total capital inflows and have an effect on asset prices—all during a crisis where asset bubbles were among the core causes. Chile is an example of a nation that designed sophisticated controls to deter intermediaries from circumventing their URR in the 1990s. Chile saw that investors were developing schemes to disguise short-term capital as FDI and responded by expanding their URR to include "potentially damaging speculative direct investment" to some success (Carvalho and Garcia 2006). As we move into a new phase of the current crisis we may do well to review the innovative responses of nations like Chile in order to design more effective controls on inflows.

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Appendix 1: Magud and Reinhart (2006) Table 3

Table 3. The Famous Chilean Case and Other Lesser Deities:
Summary of Key Findings on "Effectiveness"

		Did controls on **inflows**			
Study	Sample	Reduce the volume of net capital inflows	Alter the composition of flows	Reduce real exchange rate pressures	Make monetary policy more independent
Brazil					
Cardoso & Goldfajn (1998)		Yes (ST)	Yes (ST)		
Edison & Reinhart	1994			No	No
Reinhart & Smith (1998)		Yes (ST)	Yes (ST)		
Ariyoshi, Habermeier, Laurens, Okter-Robe, Canales-Kriljenko & Kirilenko (2000)	1993-1997	No	No	No	Yes (ST)
Chile					
De Gregorio, Edwards & Valdés (2000)	1988:I-1998:II	Yes	Yes (ST)	Yes (ST)	Yes (ST)
Edwards (1999)a			Yes	No	Yes (ST)
Edwards (1999)b	1991:6-1998:9	No	Yes	No	Yes
Edwards & Rigobon (2004)	1991:1-1999:9			Yes	
Hernández & Schmidt-Hebbel (1999)		Yes (ST)	Yes (ST)	No	Yes
Labán, Larraín & Chumacero (1997)	1985-1994	No	Yes		
Labán & Larraín (1998)					
Laurens & Cardoso (1998)		Yes (ST)	Yes	No	
Le Fort & Budnevich (1997)	1990-1994	No	Yes	Yes	Yes
Reinhart & Smith (1998)		Yes (ST)	Yes (ST)		
Valdés-Prieto & Soto (1995)	1987-1995	No	Yes	No	No
Ariyoshi, Habermeier, Laurens, Okter-Robe, Canales-Kriljenko & Kirilenko (2000)	1991-1998	No	No	No	Yes

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

Table 3 (continued). The Famous Chilean Case and Other Lesser Deities:
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
Colombia					
Le Fort & Budnevich (1997)	1990-1995	Yes (ST)	Yes	Yes	Yes
Reinhart & Smith (1998)		No	No		
Ariyoshi, Habermeier, Laurens, Okter-Robe, Canales-Kriljenko & Kirilenko (2000)	1993-1998	No	No	No	Yes
Czech Republic					
Reinhart & Smith (1998)		No	Yes (ST)		
Malaysia (1989) [1]					
Reinhart & Smith (1998)		Yes	Yes		
Malaysia (1994)					
Ariyoshi, Habermeier, Laurens, Okter-Robe, Canales-Kriljenko & Kirilenko (2000)	1994	Yes	Yes	Yes (ST)	Yes
Thailand					
Ariyoshi, Habermeier, Laurens, Okter-Robe, Canales-Kriljenko & Kirilenko (2000)	1995-1997	Yes	Yes	Yes	Yes

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