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### **How Wide a Net?** Targeting Volume and Composition in Capital Inflow Controls

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Abstract

In this paper I put forward a new framework through which to consider the design and effects of capital inflow controls. Given the existing literature highlighting a subset of inflows that bear particularly economic risks, it is worth distinguishing those controls that specifically seek to reduce these narrow categories of flows from those that seek to reduce the overall volume of inflows. I term the former type of controls “composition controls” and the latter “volume controls”. From the available cross-country literature, I construct a theoretical model of the costs and benefits of capital controls, demonstrating that the optimal extent of restriction is across some but not all categories of inflows. With this framework in mind, I examine the effects of eight previous capital control regimes over the past two decades. I find that volume controls have indeed had a greater impact on the net volume of inflows than on the specifically risky types of inflows, while the opposite holds true for composition controls. Finally I closely examine the cases of Colombia, Thailand, and Croatia during the 2000s. The former two represent volume controls, and the latter composition controls. I find that the evidence suggests that the volume controls largely failed in their objectives and had no significant preventative effect during the global financial crisis, while Croatia’s more carefully targeted composition controls did in fact insulate its financial sector and reduce its external vulnerability.

## **I. Introduction**

Over the past decade, the world's economic center of gravity has begun to shift away from advanced economies toward the developing world.<sup>1</sup> Since 2000, global growth among the world's 34 advanced economies has lagged developing world growth in each year, while the former's share of global production has declined from roughly 63 to 52 percent.<sup>2</sup> This shift toward the developing world has been accompanied by an increasingly lively debate over the role of global financial flows in economic development. Such flows have drastically increased over the past few decades, especially during the boom years of the past decade of growth. Thus, net private financial flows to the developing world increased between 2002 and 2007 from under \$60 billion to nearly \$700 billion.<sup>3</sup>

During the early 1990s similar growth was widely heralded as a boon to emerging economies. The previous decade had seen the rise of neoliberalism in mainstream economic thought, which touted the benefits of financial globalization. Theoretically, financial liberalization should allow businesses and governments access to capital at lower rates, while allowing capital from around the world to seek higher returns. Academics, think tanks, and the International Monetary Fund (IMF) have published reams of paper arguing the benefits of the free flow of capital for developing countries, primarily due to the dramatic fall in the cost of capital to firms.<sup>4</sup> While such arguments are hardly universally accepted,<sup>5</sup> all but a

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<sup>1</sup> Advanced and developing economies as defined by IMF's World Economic Outlook (WEO) Database (April 2011): <<http://www.imf.org/external/pubs/ft/weo/2011/01/weodata/weoselagr.aspx>>

<sup>2</sup> Ibid.

<sup>3</sup> Ibid.

<sup>4</sup> Giovanni Dell'Aricci et al., "Reaping the Benefits of Financial Globalization", *IMF Occasional Paper* 264 (2008); Geert Bekaert et al., "Does Financial Liberalization Spur Growth?", *Journal of Financial Economics* 77 (2005).

<sup>5</sup> Dani Rodrik, "Who Needs Capital-Account Convertibility?", Working Paper (1998); Joseph Stiglitz, "Capital Market Liberalization, Economic Growth, and Instability", *World Development* 28 (2000).

handful of countries (China and India being notable exceptions) rushed to liberalize their capital accounts.

The Thai baht crisis of 1997 brought a sudden (if temporary) halt to emerging market growth and dealt a blow to economic orthodoxy. Emerging market growth declined from 5.6 percent in 1997 to 2.5 percent in 1998, while net private financial flows to emerging markets declined by over 70 percent from their 1995 peak to their 1999 trough.<sup>6</sup> Wade offers two conflicting interpretations of this crisis: “the ‘death throes of Asian state capitalism’ story about internal, real economy causes; and the ‘panic triggering debt deflation in a basically sound but under-regulated system’ story that gives more role to external and financial system causes.”<sup>7</sup> The first interpretation, consistent with prevailing orthodoxy, seemed to dictate greater financial liberalization. The IMF embraced this narrative; identifying capital account restrictions as generating unsustainable distortions, it imposed radical liberalization on countries that were forced to accept its assistance.

This interpretation, however, prevailed neither in much of the academy nor among developing country policymakers. For them, the rapid fluctuations of capital flows threatened to collapse emerging markets, even healthy ones. Joseph Stiglitz argued that “[r]ecent developments... underscore the challenges presented by a world of mobile capital even for countries with strong economic fundamentals,”<sup>8</sup> such as much of East and Southeast Asia. For many, the lesson of Thailand was that the capital inflow controls implemented in 1996 had been too little, too late.

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<sup>6</sup> IMF.

<sup>7</sup> Robert Wade, “The Asian Debt-and-development Crisis of 1997-?: Causes and Consequences”, *World Development* 26 (1998): 1535.

<sup>8</sup> *Ibid.*, 1538.

In this new era of skepticism over unrestrained financial flows, capital controls reemerged as a serious policy instrument among developing countries. Malaysia's capital outflow controls were thought by some to have mitigated the effects of the crisis, while many credited Chile's use of capital inflow controls in the late 1990s<sup>9</sup> with shielding the economy from the currency crises that struck its Latin American peers.<sup>10</sup>

The debate over capital controls shifted remarkably quickly, culminating in the IMF tentatively endorsing capital inflow controls in certain circumstances in 2011.<sup>11</sup> While there is wide agreement that it is desirable to limit the havoc that international finance can wreak on developing markets, there is heated debate over whether it is feasible to do this through capital controls. Many have argued that the size and sophistication of international finance means that inflow controls can have at best a fleeting benefit, and are more likely simply to redirect flows through less transparent channels. Others have argued that capital controls can be effective in reducing the fall in output during crises.

Attempts to resolve this dispute empirically have been plagued by a host of methodological difficulties, which I discuss below. I argue that one conceptual problem has been a tendency to view capital inflow controls as an undifferentiated instrument whose many variations are superficial or unimportant. That is a mistake. While all inflow controls seek to dampen the procyclical nature of financial flows, there are two fundamentally distinct (though not mutually exclusive) approaches to doing so. Some countries seek to reduce the overall volume of net inflows, so that the eventual reversal is less dramatic relative to the

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<sup>9</sup> Gabriele Escobar, "Chile's Rule: Fallen Can Rise Again; After '82 Debacle, Self-Assured Market Economy Now Model for Mexico", *Washington Post* (6 June 1995): A.08.

<sup>10</sup> Sebastian Edwards, "Interest Rate Volatility, Contagion and Convergence: An Empirical Investigation of the Cases of Argentina, Chile, and Mexico", *Journal of Applied Economics* 1 (1998).

<sup>11</sup> Sandrine Rastello, "IMF Draft Guidelines Endorse Capital Controls as Last Resort for Inflows", *Bloomberg* (31 March 2011).

domestic capital markets. Others differentiate between different types of financial flows, and target only those that pose a distinct risk to the economy. I argue that the controls targeting especially risky types of inflows are more effective than those that target inflows regardless of demonstrated risk; I will refer to the former as “composition controls” and the latter as “volume controls.”

In Section II, I look in depth at the motivations of capital inflow controls. In Section III, I define and justify a distinction between these two categories of controls. In Section IV I review the cross-country literature on capital controls and present a model for the costs and benefits of capital controls by extensiveness. In Section V I review the literature on recent cases under the volume/composition framework. Finally in Section VI, I examine the recent experiences of Colombia, Thailand, and Croatia to test the effects of the two types of controls.

## **II. The purposes of capital inflow controls**

The primary risks of capital inflows are in some ways merely examples of the pitfalls generated by the financial industry in general: asset price booms and busts, overleveraged banks, etc. Certainly the American economy needed little foreign help in overleveraging and imploding over the past decade. This raises the question of why countries would discriminate between domestic and international investors or foreign and domestic currency, rather than simply putting in place robust macro-prudential measures.

Part of the answer is that macro-prudential measures work only if the relevant transactions take place within the domestic economy. If domestic investment comes from domestic savings, the latter can be influenced by interest rates and domestic banking regulation; if credit is a domestic phenomenon, it can be constrained by regulating domestic financial institutions. But these “ifs” no longer hold true when international capital can freely enter the economy. Asset bubbles can be generated by investment that bears no relation to domestic savings, while credit can be extended by foreign institutions unconstrained by domestic capital adequacy ratios. The normal tools that a central bank uses to manage the economy are inadequate where inflows become large relative to the domestic financial sector. In simple terms, internationalization can outstrip the domestic tools available to central bankers to manage economic flows.

A second part of the answer lies in fluctuating currency levels. While the demise of fixed exchange rate regimes may prevent the devastating currency runs that wreaked havoc on the developing world from 1997-2001, fluctuating exchange rates create other problems. Obligations in foreign currency can rise dramatically in real terms as assets or income

decline, quickly putting an apparently healthy economy underwater. Capital controls aim to prevent this type of crisis.

The risks entailed by capital inflows are reviewed by Magud et al., who describe capital inflows as being motivated by “four fears”: “fear of appreciation”, “fear of ‘hot money’”, “fear of large inflows”, and “fear of loss of monetary autonomy”.<sup>12</sup> It is important to understand the motivation underlying the imposition of capital controls, for motivation may affect design. A deeper look at these four fears makes clear that they all respond to the total volume of net inflows, and are likely to inspire rather undifferentiated controls.

The first fear is that inflows will lead to appreciation. As the value of a currency is determined by the supply of and demand for it, *ceteris paribus*, greater net inflows lead to a stronger currency. Many developing countries see undervalued exchange rates as a key to an export-led growth strategy, taking their cue from the Japanese (and now Chinese) model. To some extent countries can depress their currency in the presence of net inflows by purchasing foreign exchange with local currency, as a number of countries in Southeast Asia did in the aftermath of the 1997 crisis. This strategy, known as “sterilization”, requires dexterity in the execution of discretionary monetary policy, and is not always successful: “[S]uch sterilization can be difficult to execute and sometimes even self-defeating, as an apparently successful operation may raise domestic interest rates and stimulate even greater capital inflows.”<sup>13</sup> Warnock (2011) explains further, emphasizing the difference between the real exchange rate and the nominal exchange rate:

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<sup>12</sup> Nicolas Magud et al., “Capital Controls: Myth and Reality – A Portfolio Balance Approach”, *NBER Working Paper* 16805 (2011): 3-5.

<sup>13</sup> Jang-Yung Lee, “Sterilizing Capital Inflows”, *IMF Economic Issues* 7 (1997): 1-2.



In almost every case, countries that limit nominal exchange rate appreciation through reserve accumulation experience a real appreciation anyway, because the reserve accumulation is inflationary. So they end up in the same place—with a real appreciation—and have only traded off nominal exchange rate appreciation for higher inflation.<sup>14</sup>

Given the limits of sterilization, some developing countries pursuing devaluation have supplemented or replaced sterilization with capital inflow controls. By restricting, taxing, or penalizing capital inflow, developing countries can reduce the demand for their currencies and, in theory, impede appreciation.

The fear of ‘hot money’, is slightly different. Here there is no animus toward foreign capital inflows as such; the concern is that such flows are likely to be fickle, for while capital inflows “start at different times... they often end together, particularly in 1997-98 and 2008-09.”<sup>15</sup> This is of particular concern to developing countries: “In contrast to AEs [advanced economies], where large inflows and outflows traditionally take place against generally stable net flow, swings in gross inflows to EMs [emerging markets] generally result in significant changes in *net* capital flows.”<sup>16</sup> The risk of sudden outflows provides one of the primary justifications for restricting inflows.

The third fear directly targets large inflows, which are generally thought to be highly pro-cyclical, as “foreign investors may be subject to herd behavior and suffer from excessive optimism”.<sup>17</sup> If foreign investors are indeed (implicitly irrational) “return chasers”,<sup>18</sup> they can

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<sup>14</sup> Francis Warnock, “Doubts About Capital Controls”, *Council on Foreign Relations* (2011): 8.

<sup>15</sup> IMF Staff, “Recent Experiences in Managing Capital Inflows—Cross-Cutting Themes and Possible Policy Framework”, *International Monetary Fund* (2011): 11.

<sup>16</sup> *Ibid.*, 9.

<sup>17</sup> Ostry et al. (2010), 4.

grossly exacerbate bubbles in asset and property markets. These bubbles are particularly troublesome when they pop, but even on the upswing they can cause significant distortions. Capital can be inefficiently reallocated away from productive sectors, and “the modest size of EM capital markets relative to AEs’ also means that a small shift in portfolio allocations from AEs to EMs could easily overwhelm EMs’ absorptive capacity.”<sup>19</sup>

Finally, the fear of loss of control of monetary policy implicates the macroeconomic “trilemma”, which posits that one cannot simultaneously pursue (1) a fixed exchange rate, (2) a domestically-oriented monetary policy, and (3) free international capital mobility. For example, if a country wishes to raise interest rates to cool an overheated economy, it cannot do so if it has both an open capital account and a fixed exchange rate; “funds attracted from abroad [will] drive interest rates back down to world levels”<sup>20</sup>. The country must either allow the currency to appreciate, or restrict net inflows if it seeks to preserve a competitive exchange rate. The reverse holds true for reducing interest rates, as a country must either allow outflows and subsequent depreciation or preserve the value of the currency at the expense of capital mobility.<sup>21</sup> In the modern context, countries implementing capital controls in order to raise domestic interest rates may be as concerned about further increasing the volume of net inflows as about appreciation, but the logic still applies: absent capital controls, interest rates cannot be raised without attracting large inflows that defeat the purpose of contractionary monetary policy.

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<sup>18</sup> Warnock, 4.

<sup>19</sup> IMF Staff, 9.

<sup>20</sup> John Goodman and Louis Pauly, “The Obsolescence of Capital Controls? Economic Managements in an Age of Global Markets”, *World Politics* 46 (1993): 56.

<sup>21</sup> Maurice Obstfeld et al., “The Trilemma in History: Tradeoffs among Exchange Rates, Monetary Policies, and Capital Mobility”, *Review of Economics and Statistics* 87 (2005): 423.

While this catalog of motivations behind controls on capita inflows is useful, it overlooks the critical distinction between inflows in general and specific categories of inflows. Three categories of inflows stand out as particularly troubling: those that increase the vulnerability of the financial sector, those that entail foreign exchange denominated obligation, and short term debt. In the following section I explain why capital controls that target these high-risk inflows are more likely to succeed than those that merely seek to reduce net volume of inflows.

### **III. Distinguishing volume and composition controls**

The traditional view is that capital controls are “a single policy instrument... [with] many policy objectives”.<sup>22</sup> In this section I argue, by contrast, for a distinction between capital inflow controls that aim to reduce volume and those targeting composition, or particularly risky types of inflows. In Part IV, I develop a model that predicts the differential effects of these two types of controls.

For Magud et al. (2011), capital controls are all aimed at achieving four different objectives:

1. Reduce the volume of capital flows
2. Alter the composition of capital flows (towards longer maturity flows)
3. Reduce real exchange rate pressures
4. Allow for a more independent monetary policy<sup>23</sup>

The logic of this division is not entirely clear. For example, the first and third objectives are theoretically inseparable. Assuming fixed money supplies, exchange rates are determined by the relative demands for different global currencies, which in turn is based on the demand for all goods and assets denominated in that currency, i.e. flows into the current and capital accounts. *Ceteris paribus*, a reduction in net capital inflow volumes equals a reduction in relative demand for a currency, and thus a reduction in currency prices.<sup>24</sup>

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<sup>22</sup> Magud et al., 1.

<sup>23</sup> *Ibid.*, 7

<sup>24</sup> It is not impossible to construct a narrative by which reductions in volume are not linked to currency prices, e.g., if the imposition of such macro-prudential measures improves confidence in an economy and induces

Monetary policy independence is a more mixed case, as the same capital control measure could be used either purely to increase domestic monetary autonomy or to dampen demand for its currency (which would count here as a volume control). On the one hand, a central bank might seek to raise domestic interest rates without increasing demand for its currency (e.g., by raising the interest rate while imposing a tax on foreign bond purchases that canceled out the extra returns for foreign investors). On the other hand, if a central bank were mainly concerned with appreciation, it could simply tax foreign bond purchases with no compensatory interest rate hike. In theory that might shift international investment toward a country's stocks, but realistically it would likely cause investors to flee to other countries' bonds with a higher real rate of return, resulting in reduced inflow volumes. Usually such measures occur in concert with domestic measures and fall somewhere in between the two poles, making it rather difficult to distinguish the goals of monetary policy independence and net inflow volume reduction. Given that bond purchases are not a risky inflow category, however, I classify both as volume controls.

None of Magud's objectives captures the crucial distinction between those controls that aim to reduce the volume of inflows and currency levels (henceforth collapsed into volume-based controls) and those that target only specific types of flows. Ostry et al. (2011) distinguishes between measures that "may apply to all flows, or may differentiate by type or duration of the flow (debt, equity, direct investment; short-term vs. medium- and long-

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investment. More likely, however, studies finding a divergence between net inflow volumes and currency levels are seeing evasion of inflow controls, such that only officially measurable inflows decline. Despite such occasional findings, it is notable that Magud et al.'s literature review finds a higher correlation between success in these two objectives than between any other pair of objectives. I take Magud et al.'s summary of case studies and assign the following values: No success = -1, unclear = 0, short-term success = .5, and success = 1. I do this independently for the individual case studies and for the composite of country experiences. In both cases the correlation between reducing the net volume of flows and reducing exchange rate pressure is the highest of the six possible correlations.

term).”<sup>25</sup> It is critical to point out that, in my taxonomy, composition controls are those that target not *any* specific type of flow, but only those flows demonstrated to be risky. While volume controls seek to address “macroeconomic concerns [that] center around the impact of aggregate inflows on exchange rate appreciation”, composition controls are concerned with “financial-sector stability”.<sup>26</sup>

This distinction tends to get lost in the literature to date. For example, Magud et al. acknowledge that altering composition is one of the motivations of capital controls, but they define “composition” only in terms of longer versus shorter maturity.<sup>27</sup> While this is one important aspect of inflow composition, it is hardly the only one. By contrast, Ostry et al. (2010) point to foreign-currency debt as paramount among risky inflow categories.<sup>28</sup> Debt is always riskier than equity during a downturn as the obligations do not decrease proportionally to the loss of income; foreign-exchange-denominated debt will actually increase in real terms as the domestic currency depreciates, resulting in an increase in liabilities just as both nominal and real incomes are declining. The better targeted controls of inflows are “aimed at achieving a less risky external liability structure”.<sup>29</sup> This includes altering the denomination of foreign debt and reducing external financial sector liabilities in addition to simply increasing maturity.

In Magud et al.’s model, a blunt view of inflow composition generates a correspondingly blunt mechanism for altering composition. Put briefly, the share of short-term capital flows in total flows is determined by investors based on the difference in rates

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<sup>25</sup> Jonathan Ostry et al., “Managing Capital Inflows: What Tools to Use?”, *IMF Staff Discussion Note* 11/6 (2011): 11.

<sup>26</sup> *Ibid.*, 8.

<sup>27</sup> Magud et al., 7.

<sup>28</sup> Jonathan Ostry et al., “Capital Inflows: The Role of Controls”, *IMF Staff Position Note* 10/04 (2010): 9.

<sup>29</sup> *Ibid.*, 5.

of return between short- and long-term and an exogenous risk preference. Thus any blanket imposition of a penalty on returns from capital inflows, by reducing the gap between short- and long-term returns, will reduce the share of short-term flows in total flows.<sup>30</sup> Just as there is a variety of capital flows, however, there is a variety of inflow controls. Some controls resemble the blunt instruments of Magud et al.'s theoretical model, such as Brazil's nearly comprehensive tax on inflows in the 1990s; some controls are designed to lengthen the average maturity of external debt, such as Colombia's controls of the 1990s; and others target the specific types of risky flows identified by Ostry et al, such as Croatia's this past decade. I maintain that the important distinction is between the first and the latter two – between volume-based and composition-based controls. While measures aimed at reducing net inflow volumes may incidentally alter composition toward a less risky structure, and measures aimed at discouraging specific types of flows may reduce the net inflow volumes, the two are distinguishable in both their design and their primary effects.

One major hurdle remains: establishing a reliable framework by which to differentiate the nature of controls. Here I examine the primary types of capital inflow controls that have been implemented by relatively liberalized middle-income countries over the past two decades, and classify them by whether they target particularly risky types of capital inflows or target inflows without regard to their risk profile. Unfortunately, determining the nature of capital controls is hardly an exact science. Countries may implement controls targeted at both volume and composition. Moreover, countries may dissemble about the purpose of capital controls. Attempting to devalue one's currency in order to boost exports is typically seen as a non-cooperative economic strategy – as it is logically impossible for all countries simultaneously to decrease the relative value of their

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<sup>30</sup> Magud et al., 11-13.

currencies – and may spur condemnation or even retaliatory devaluation among trading partners.<sup>31</sup>

One must to focus on the actual incidence of various control measures, beginning with the locus of regulation. Ostry et al. (2011) usefully distinguish between economy-wide controls and financial-sector-specific controls.<sup>32</sup> The former comprises distinctions among broad categories of inflows (e.g. bonds, equities, foreign direct investment (FDI)) and makes no distinction based on what type of person or institution is making such investments. The latter, on the other hand, targets financial institutions and tends to restrict certain limited kinds of foreign-currency transactions and accumulation of external debt.

Returning to the classification of risky inflows of Ostry et al. (2010), we can see that foreign-currency debt is the riskiest category.<sup>33</sup> While the risk of a credit crisis makes such borrowing riskiest in the financial sector, it is also hazardous among companies and individuals. Thus we should include restrictions on foreign-currency borrowing as among the smart composition-based controls. Restrictions on foreign borrowing in local currency form something of an intermediate category. While such restrictions may allow for monetary tightening while discouraging additional inflows, as in Chile in the 1990s,<sup>34</sup> they may also shift the mix of inflows away from debt toward equity and FDI, and thus be interpreted as a

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<sup>31</sup> South Korea, for example, denied that its 2010 capital controls were designed to “keep[] the won artificially low for exporters”, but instead aimed to reduce volatility. Song Jung-a, “S Korea Plans Capital Controls”, *Financial Times* (19 October 2010). It is difficult to evaluate the competing claims; parts of the controls were aimed at particularly volatile types of foreign exchange derivatives, yet the blanket tax on foreign bond purchases smacks of either currency manipulation or a desire for monetary policy autonomy. *Economist*, “The Won that Got Away: A Surgical Strike in a Volatile Market” (17 June 2010).

<sup>32</sup> Ostry et al. (2011), 11.

<sup>33</sup> Ostry et al. (2010), 9.

<sup>34</sup> Salvador Valdez-Prieto and Marcelo Soto, “The Effectiveness of Capital Controls: Theory and Evidence from Chile”, *Empirica* 25 (1998): 147.



composition measure. I will treat discrimination on the basis of maturity as a composition control.

I distinguish here between controls that are designed to alter the composition of inflows away from demonstrably risky categories and controls that are designed to reduce the overall volume of inflows (including those that target a particular, less-risky type of inflow, such as portfolio inflows). The former includes foreign liabilities in the financial sector, liabilities in foreign currency throughout the economy, and short-term debt instruments. It is my contention that well targeted “composition controls” may allow countries to protect particularly vulnerable sectors of the economy without a wholesale loss of the benefits that capital mobility may offer.

#### **IV. A model of costs and benefits for composition and volume controls**

Prior to the last few decades, open capital accounts were the exception rather than the rule. As a result, most scholarship has focused on the effects of financial liberalization, rather than examining those few countries that have liberalized and then subsequently implemented more limited controls. Nevertheless, we can readily identify a variety of capital controls, including implicit or explicit taxes on inflows, which reduce the real returns to investors in certain assets (or the country in general) and channeling capital flows elsewhere., or even administrative bans certain types of inflows, as in Thailand (2006-08).

There is an active debate over whether such controls have a significant and lasting impact. One school of thought holds that capital controls will have more only a fleeting impact, due to the ability of international finance to design ever more sophisticated evasive measures. Edwards (1999) thus concludes that “[l]egal controls on capital mobility are not always translated into actual restrictions on these movements. In country after country, the private sector has found ways of getting around controls.”<sup>35</sup> Edwards himself, however, does not claim that controls are entirely ineffective, for the cost of evasion still deters some inflows.

Cross-country studies of capital controls (I put aside case studies for the time being) generally proceed in one of two ways. The first, like Magud et al., treats inflow controls as a single measure, and examines its effects on different outcome measures. The implicit assumption is that all inflow controls are similar in their aims. This is, I argue, a flawed assumption, but the results of such studies can be informative. The broadest such study, conducted by Montiel and Reinhart (1999), covers some 15 countries during the 1990s.

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<sup>35</sup> Sebastian Edwards, “How effective are capital controls?”, *Journal of Economic Perspectives* 13, (1999): 67.

Controlling for external factors such as interest rates in advanced economies, they “conclude that explicit capital inflow restrictions, and ‘prudential measures’ seem to be more effective in altering the composition of capital inflows rather than reducing their magnitude.”<sup>36</sup> Such a conclusion, however, is tenuous if a country were to design capital controls with only one of these purposes in mind. (If, say, composition and volume restrictions were equally effective, but 12 countries implemented the latter and only 3 the former, an indiscriminate sampling might find that capital controls had four times as large an effect on composition of inflows as on volume.) Moreover, other multilateral studies conclude that capital controls are equally ineffective at altering composition and volume. While the demonstrated ability of capital controls to alter composition is heartening, we can put little stock in their conclusion of the relative effectiveness without a more detailed look at the nature of the the controls.

The second approach is to pass over the intermediate step. Capital controls, after all, are designed to enhance long-run growth prospects; it is arguably more important to determine whether they do so than precisely how they do so. On that score, Rodrik (1998), examining the 1975-1989 period, concludes that “[c]apital controls are essentially uncorrelated with long-term economic performance once other determinants are controlled for” (though he argues against dismantling them).<sup>37</sup> There are, unfortunately, two problems with taking this as evidence against the current utility of controls. First, this was a period in which capital controls were widespread in both the developing and developed world, and international capital flows were much smaller than they are today. Second, and more importantly, capital controls are mainly designed to prevent and mitigate crises, and their

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<sup>36</sup> Peter Montiel and Carmen Reinhart, “Do Capital Controls and Macroeconomic Policies Influence the Volume and Composition of Capital Flows? Evidence from the 1990s”, *Journal of International Money and Finance* (1999): 632.

<sup>37</sup> Rodrik, 8.

success or failure should be judged within this context. To look at a decade and a half of overall growth may obscure important differences in how well countries are shielded from crisis. (Admittedly the converse of this is that capital controls might be effective in a crisis but a drag on growth during expansionary periods. This is beyond the scope of the paper, however.)

A more relevant cross-country study comes from Ostry et al. (2010), who treat the recent financial crisis as an exogenous shock to developing countries. They conclude that controls “paid dividends as far as reducing financial fragility.”<sup>38</sup> The study does not directly answer the question of what type of capital inflow control is most effective in reducing financial fragility, yet it suggest, first, that some capital controls may offer some defense against external shocks, and, second, that certain types of flows are particularly risk-inducing.

This research suggests a theoretical basis for concluding that cost-benefit analysis favors composition controls over volume controls. Capital controls, after all, do bear a cost. Forbes (2007) reviews several microeconomic studies of the effects of capital control imposition, and finds “compelling empirical evidence that capital controls can affect the supply and cost of capital, market discipline, the allocation of resources, and the behavior of firms and individuals.”<sup>39</sup> While a comparison of these costs across countries is all but impossible, the fact of costs is worth keeping in mind.

Let us then assume four stylized facts: 1) the aggregate benefit of capital inflow controls exceeds the aggregate costs in cases that lie between total liberalization and high restriction; 2) the aggregate costs and benefits of a relatively closed versus an entirely open

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<sup>38</sup> Ostry et al. (2010), 5.

<sup>39</sup> Kristin Forbes, “The Microeconomic Evidence on Capital Controls: No Free Lunch”, in *Capital Controls and Capital Flows in Emerging Economies: Policies, Practices and Consequences*, ed. Sebastian Edwards (Chicago: University of Chicago, 2007), 195.

capital account are roughly equal; 3) the marginal benefit of restricting the riskiest types of flows exceeds the marginal benefit of restricting the least risky types of flows; and 4) that the marginal cost of restriction is constant across all types of flows. All four of these assumptions need to be justified.

The first assumption stems from evidence concerning the modern (i.e. after the period covered by Rodrik) character of capital controls, which tend to be implemented temporarily and usually only during extreme inflow surges such as those that preceded the late-1990s and late-2000s crises. If we accept the Ostry et al. (2010) position that such limited controls have a beneficial effect during a period of crisis, and there is relatively little time for the distortions to take a toll beforehand, this appears to be a valid assumption.

The second assumption stems from lack of a consensus on the effect of financial liberalization. Eichengreen (2001) surveys the literature and finds that, despite wide agreement on the benefits of capital account liberalization, there is a distinct “lack of empirical substantiation of its fundamental tenets”.<sup>40</sup> Rodrik’ similarly finds that the degree of capital account liberalization has no long-run growth implications. While the precise balance of costs and benefits at the endpoints (total openness, near-total restriction) do not change the implications of the model vis-à-vis composition versus volume, it is worth having a rough framework to allow a comparison at the margin between intermediate stages.

The third assumption follows from the findings of Ostry et al. (2010) on the risks of different flows (though we still need to demonstrate empirically that composition of flows can be efficiently targeted.) If one assumes that well-designed restrictions generally begin by

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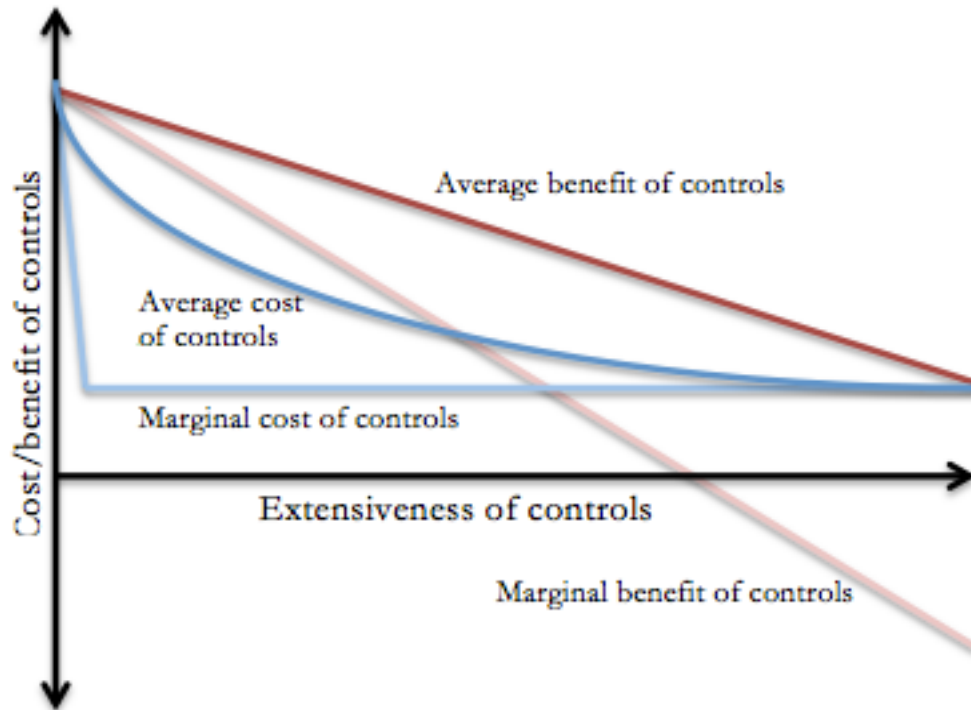
<sup>40</sup> Barry Eichengreen, “Capital Account Liberalization: What Do Cross-Country Studies Tell Us?”, *World Bank Economic Review* 15 (2001): 360.

targeting the most harmful types of flows, and then less discriminating restrictions proceed to successively less harmful flows (or that broader controls tend on average to target less harmful flows), we can anticipate a declining marginal benefit curve.

The fourth assumption of constant costs requires some clarification. There is presumably substantial administrative cost associated with switching from no capital controls to any capital controls, thus significantly raising the marginal cost of the first restriction, regardless of its target. Beyond that, one might argue that a simple, blanket Tobin-style tax on inflows would be simpler and less costly highly differentiated composition controls. But there is no such thing as a simple x-percent tax on inflows. Transfers between corporate subsidiaries, currency exchanges, asset purchases, insurance swaps, bond purchases, etc. all require individually tailored restrictions. The constant cost assumption does not preclude the possibility that some inflow controls are more costly than others; it merely assumes that costs do not deviate in a heteroskedastic way. In other words, there is no reason to assume that the costs of regulating riskier flows are systematically different than for less risky flows.

Putting these together in a model, we can construct a marginal benefit curve that declines linearly as the extensiveness of controls (across flow types) increases. The marginal cost curve begins quite high with the first restriction, but after that is constant. The average benefit and cost curves reflect these marginal cost curves, such that they are equal at the points of complete liberalization (zero restrictions) and complete restriction (i.e. a largely closed capital account, à la India or China). We arrive at the following:

Figure 1: Costs and benefits of restrictions on progressively less risky inflow categories



The model indicates that the optimal point of restriction – where marginal cost equals marginal benefit – is at a level where some types of flows are restricted, but others are not. It is important to note that this concerns *extensiveness* of restrictions (i.e. type of flow) rather than *intensiveness* of restrictions (i.e. how heavily taxed a given flow is). The latter is far too dependent on domestic circumstances, and would be akin to trying to identify an optimal interest rate across all developing countries. This model, grounded in the available cross-country literature, presents a strong case for well-targeted composition-based controls rather than those that broadly restrict all or most kinds of inflows. We now turn to the literature on various episodes of inflow controls that may allow us to test the model.

## **V. Assessing the effects of volume and composition controls**

Two steps are necessary to demonstrate that well-targeted composition controls are more effective and desirable than controls targeting volume. The first is to show a meaningful difference in the proximate results of composition controls versus volume controls; that is, that composition controls have a larger effect on composition of inflows than volume controls, and vice-versa. Second, one must show that altering the composition of inflows leads to superior outcomes as compared to reducing the volume of inflows.

This analysis would be straightforward if a large number of comparably situated countries had experimented in a random fashion with volume and composition controls; readily available econometric devices could then identify the differential effects of the two strategies. Unfortunately, regression analysis is impossible given the extremely limited sample size. For example, we might wish to compare the economic performance of countries that did and did not implement capital controls prior to the late-2000s global financial crisis. But we must first restrict the range to those countries that both needed and could plausibly implement such controls; that would exclude both advanced economies, less prone to wild fluctuations, and poor countries, which lack the regulatory sophistication to manage such controls. One is left with a few dozen middle-income countries, of which only a small number have implemented controls. While Ostry et al. (2010) tease out results that suggest that capital controls may have softened the blow for some countries, Warnock points out that “research designed slightly differently comes to polar opposite conclusions”.<sup>41</sup> Whether or not a regression of control-implementing versus non-implementing countries is feasible as an abstract matter, it would be highly unlikely to yield statistically significant results.

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<sup>41</sup> Warnock, 3.



Moreover, the endogeneity problem with discretionary economic policy is inescapable. Countries that choose to implement capital controls demonstrate a concern over inflows that may indicate heightened vulnerability. So, too, the choice between primarily targeting volume versus composition is hardly exogenous. Perhaps countries that implemented the most comprehensive volume controls had the most volatile inflows, resulting in a still-devastating collapse, while those that implemented carefully targeted composition controls might still have foreign-exchange debt well above sustainable levels.

Given the impossibility of testing my hypothesis through quantitative methods, I turn instead to a qualitative analysis of the available case studies. While this does not eliminate the endogeneity problem, case-by-case discontinuity analysis ameliorates it to a certain extent. The proximate effects of controls (i.e. on composition and volume of inflows) can be determined largely through the existing literature. As for the ultimate effectiveness of these controls, one can construct a meta-analysis of different types of inflow controls (if the conflicts between studies can be resolved).

Keeping in mind the framework established in Section III, we can now turn to the cases to attempt to classify capital inflow controls by whether they target composition (as defined here) or volume. Magud et al. summarize studies of seven cases of inflow controls in six countries: Brazil (1994-95), Chile (1991-98), Colombia (1991-98, 2007-08), Croatia (2004-08), Malaysia (1994), and Thailand (1995-96).<sup>42</sup> To this list I add Colombia (2007-08) and Thailand (2006-08), the former identified by Ostry et al. (2010) with empirical literature and the latter without.<sup>43</sup> Thus we are left with eight episodes in six countries:

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<sup>42</sup> Magud et al., 27-30.

<sup>43</sup> Ostry et al. (2010), 16-17.

Table 1: Identifying past cases of volume and composition controls			
Country	Years	Primary target	Description
Brazil	1994-95	Volume	“Explicit tax on capital flows on stock market investments, foreign loans, and certain foreign exchange transactions” <sup>i</sup> ; breadth of controls indicates concern over inflow volumes. “[C]ontrols were placed on capital inflows in an effort to limit short-term capital and alleviate the effects of too much foreign currency” <sup>ii</sup>
Chile	1991-98	Volume	Unremunerated reserve requirement (URR) on foreign borrowing. Valdes-Prieto describe the motivation as monetary independence where heavy sterilization had already been utilized to constrain appreciation; <sup>iii</sup> subsequent extension to “potentially speculative FDI” <sup>iv</sup> indicates a focus on volatility of overall inflows (volume) rather than on specific risks in the financial sector (composition)
Colombia	1993-98	Composition	URR on short-term foreign borrowing; indicates attempt to increase maturity of foreign debt obligations (composition), yet persistent ratcheting-up of reserve requirements indicates an attempt to restrict the volume of inflows. Cardenas and Barrera (1997) support the former view, but acknowledge debate. <sup>v</sup> According to this paper’s criteria, discrimination on the basis of maturity qualifies as a composition control.
Colombia	2007-08	Volume	Largely similar policy as the 1990s, but included “restrictions on portfolio investments” and dropped maturity discrimination, thus indicating an attempt to reduce total inflow volumes. <sup>vi</sup>
Croatia	2004-08	Composition	Marginal reserve requirements introduced on banks’ foreign borrowing. <sup>vii</sup> Restriction to financial sector indicates composition concerns.
Malaysia	1994	Composition	“[M]easures were specifically designed to limit short-term capital inflows in the form of bank foreign borrowing and ringgit deposits by bank or nonbank foreign customers” <sup>viii</sup>
Thailand	1995-96	Composition	“[A] variety of measures aimed at moderating foreign-financed lending.” <sup>ix</sup>
Thailand	2006-08	Volume	Controls began with financial sector foreign-currency debt, but expanded to “30% [URR] on all capital inflows.” <sup>x</sup>
Notes:			
i Ostry et al. (2010), 16-17.		vi Alvaro Concha and Arturo Galindo, “An Assessment of Another Decade of Capital Controls in Colombia: 1998-2008”, <i>Inter American Development Bank</i> (2009), 6.	
ii Bernardo Carvalho and Márcio Garcia, “Ineffective Controls on Capital Inflows under Sophisticated Financial Markets”, in <i>Financial Markets Volatility and Performance in Emerging Markets</i> , ed. Edwards and Garcia (Chicago: University of Chicago, 2008), 36.		vii Ljubinko Jankov, “Spillovers of the Crisis: How Different Is Croatia?”, <i>Oesterreichische Nationalbank Workshops</i> 15 (2009): 128.	
iii Valdes-Prieto & Soto, 147.		viii Akira Ariyoshi et al., <i>Capital Controls: Country Experiences with their Use and Liberalization</i> (Washington, D.C.: IMF, 2000), 50.	
iv Ostry et al. (2010), 16.		ix Jittrapanun & Prasartset, 6.	
v Mauricio Cárdenas and Felipe Barrera, “On the Effectiveness of Capital Controls: The Experience of Colombia During The 1990s”, <i>Journal of Development Economics</i> 54 (1997): 37.		x <i>Ibid.</i> , 29.	

Using this dataset, we can now ask whether controls aimed at composition and at volume had significantly different effects. For the sake of simplicity I accept the conclusions of Magud et al.'s meta-analysis where available, supplementing with outside sources where indicated. I do make one alteration, however. Where some sources identify no effect and some identify only a short term effect, I label this "No/ST" to distinguish it from the genuinely "Unclear" cases (where some sources find no effect and others a lasting effect).

Country	Years	Primary target	Reduced net volume?	Altered composition?
Brazil	1994-95	Volume	No/ST	No/ST
Chile	1991-98	Volume	No/ST	Yes
Colombia	1993-98	Composition	No/ST	Unclear
Colombia <sup>i</sup>	2007-08	Volume	Unclear	No
Croatia <sup>ii</sup>	2004-08	Composition	No	Yes
Malaysia	1994	Composition	Yes	Yes
Thailand <sup>iii</sup>	1995-96	Composition	Unclear	Unclear
Thailand <sup>iv</sup>	2006-08	Volume	Yes	No
Notes:				
<sup>i</sup> See Section VI for details of dispute and agreement among studies.				
<sup>ii</sup> Jankov, 130-131.				
<sup>iii</sup> Ariyoshi et al. conflict with Jittrapanun & Prasartset, who find no effect on either volume or composition.				
<sup>iv</sup> See the case study of Thailand from Section V for a reconciliation of the positions of Jittrapanun & Prasartset and Coelho & Gallagher.				

To summarize the results, I assign "No" a value of 0, "No/ST" a value of .25, "Unclear" a value of .5, and "Yes" a value of 1. I then average the results from the four composition cases and the four volume cases, with the following results:

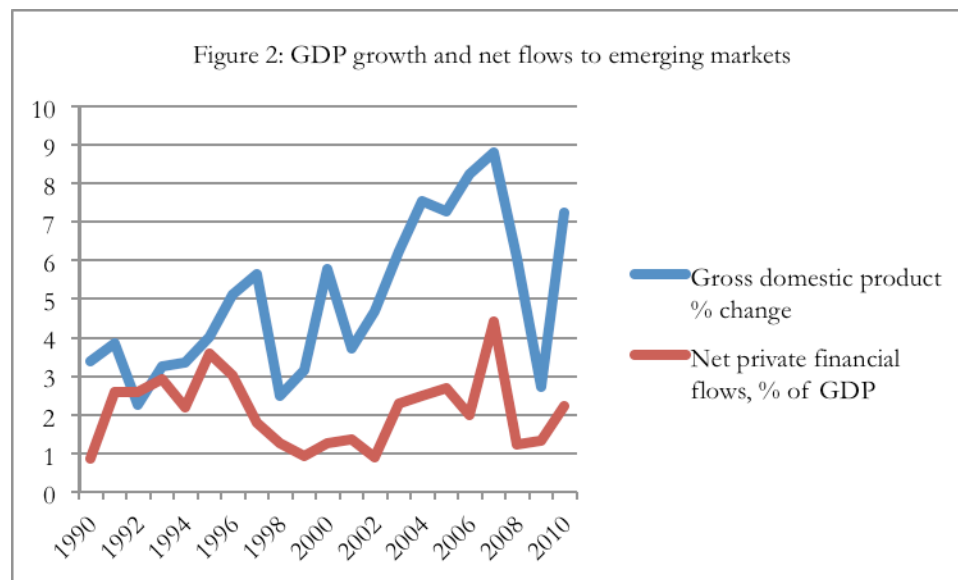
Primary target	Reduced net volume?	Altered composition?
Volume	.5	.3125
Composition	.4375	.75

While we observe significant spillover (volume controls have an effect on composition and vice versa), both types of controls are more effective in addressing their respective target. Furthermore, composition controls are more effective at altering the composition of inflows than volume controls are at reducing the net volume of inflows. While this is admittedly a crude method, the results provide tenuous confirmation of two elements of this paper's core argument: (1) that the differential effect of composition and volume controls roughly corresponds to their design, and (2) that controls are more likely to succeed in their immediate aim where they target inflows in limited risky categories than where they seek to reduce the net volume of inflows. This demonstrates that the findings of the cross-country empirical literature, which tend to show a greater effect of controls on the composition than on the volume of inflows, are not spuriously derived from an unbalanced set of capital control regimes in the sample. The next and crucial question is obviously whether such an effect on composition is desirable.

To address that question, I turn to three recent case studies: Colombia, Thailand, and Croatia. These three cases are those from this past decade that are covered in the existing literature, and that present both volume-based controls (Colombia and Thailand) and more targeted composition-based controls (Croatia). Furthermore, they cover the full spectrum of effects: Thailand showed a reduction in volume without an effect on composition, Colombia is somewhat unclear in both areas, and Croatia experienced an alteration of composition without a reduction in volume.

## VI. Case Studies<sup>44</sup>

As mentioned in the introduction, the early part of the 2000s saw an enormous surge in growth among developing economies and capital flows to such economies. The boom peaked in 2007, when growth among emerging markets peaked at 8.8 percent and net private financial flows reached 4.4 percent of GDP:<sup>45</sup>



Colombia and Thailand responded to this surge of inflows by implementing unremunerated reserve requirements (URR) on broad classes of inflows, along with other measures. URRs require that an amount equal to a certain percentage of inflows be deposited in a non-interest bearing account within the country for a given period. Effectively, the measure is a tax on international investors, as the money cannot be invested elsewhere, thus foregoing returns. Croatia, meanwhile, took a number of prudential steps in its banking sector, some of which paid special attention to foreign obligations and thus took the form of capital inflow controls. Looking at the three cases, I conclude that Croatia's

<sup>44</sup> Unless otherwise specified, all data is from WEO.

<sup>45</sup> Ibid.

more modest, composition-based controls were effective in shielding its financial sector from contagion, and had superior growth outcomes during the global recession.

#### A. Colombia (2007-08)

Colombia's experience in the 2000s boom was not atypical. From 2002 to 2007 it experienced an average of 5 percent growth.<sup>46</sup> Over this period, net financial inflows totaled 8.7 percent of 2007 GDP, while the currency appreciated by 15 percent against the dollar.<sup>47</sup> There is some evidence that this appreciation adversely impacted Colombia's trade competitiveness, as its current account surplus fell from .9 percent of GDP in 2000 to -2.9 percent in 2007. There was a distinct element of déjà vu; the 1990s had seen a virtually identical pattern, with GDP growth rising and the current account deficit widening prior to the crisis of 1998-99.

Colombia had implemented capital controls in the 1990s in response to this trend. The controls, as indicated above, were relatively tightly targeted at the financial sector, and sought to reign in borrowing from abroad and increase the maturity profile of foreign debt. There is disagreement over whether they succeeded in these objectives, but measured simply by growth outcomes the controls failed. Colombia experienced a severe contraction, with the economy contracting by 4.2 percent in 1999. This was solidly middle of the pack for the region: Chile, Peru, and Brazil were comparatively unscathed, while Venezuela was more adversely affected and the Argentine economy began a four year collapse. Yet the lesson for Colombian policymakers, apparently, was that the controls of the 1990s had been insufficiently broad, failing to prevent a large-scale exodus of foreign capital during the crisis.

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<sup>46</sup> Ibid., GDP in constant prices.

<sup>47</sup> Bruno Coelho & Kevin Gallagher, "Capital Controls and 21<sup>st</sup> Century Financial Crises: Evidence from Colombia and Thailand", *Political Economy Research Unit Working Paper 213* (2010): 7.

With this historical experience in mind, the developments of early 2007 were not encouraging: “in the first four months of the year... [t]he exchange rate appreciated an additional 5 percent in nominal effective terms. Gross inflows rose sharply, spurred on by rising interest rate differentials and market expectations of a peso appreciation.”<sup>48</sup> The central bank implemented sterilization measures, but these failed to stem the appreciation.<sup>49</sup> As a result, in May 2007 the following measures were put in place:

- (1) URR “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.”<sup>50</sup>
- (2) “Banks were... required to keep their overall gross positions in [currency derivative] instruments to no more than 500 percent of their capital.”<sup>51</sup>
- (3) Limits on maturity mismatches; banks could “only borrow abroad if the resources [were] to be lent with equal or shorter maturity.”<sup>52</sup>
- (4) Later than month, the URR was extended to cover portfolio inflows.
- (5) Controls were adjusted several times over the next 18 months, but notably in may 2008 a two year minimum stay requirement was imposed for FDI.<sup>53</sup>

The first three of these measures quite clearly fall under composition controls. Though (1) is rather broad, its restriction on debt rather than equity is notable, and (2) and (3) are quite specifically focused on banks’ foreign exposure. The restriction on portfolio inflows (4) and

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<sup>48</sup> Benedict Clements & Herman Kamil, “Are Capital Controls Effective in the 21st Century? The Recent Experience of Colombia”, *IMF Working Paper* 09/30 (2009): 5.

<sup>49</sup> Coelho & Gallagher, 8.

<sup>50</sup> Ibid.

<sup>51</sup> Clements & Kamil, 6.

<sup>52</sup> Leonardo Villar, “Latin America: Comments on Financial Regulation and International Capital Flows in Latin America”, *Journal of Globalization and Development* 1 (2010): 7.

<sup>53</sup> Clements & Kamil, 7.

later FDI (5), however, clearly demonstrate a concern over the volume of inflows. Even if both measures are aimed at discouraging particularly flighty capital, portfolio inflows and FDI are the two categories of inflows identified by Ostry et al. (2010) as least hazardous.<sup>54</sup>

As indicated above, the literature on the proximate effect of Colombia's capital controls is mixed on the question of volume of inflows (only Coelho and Gallagher find an effect), and uniformly fails to find statistically significant effects on composition of inflows (in terms of FDI and non-FDI inflows,<sup>55</sup> as well as short-term and long-term inflows<sup>56</sup>). The lack of efficacy in altering composition is unsurprising, as this was not the intent; the lack of definitive effect on volume, meanwhile, may be due to the broad loopholes carved out for institutional investors such as pension funds.<sup>57</sup>

In attempting to discern what effect capital controls might have had on the decline in growth in from 2008 to 2009, we have little to work with. The only result from any empirical literature that bears upon categories identified by Ostry et al. (2010) as being statistically significant is foreign debt liabilities; Clements and Kamil do find a small effect on foreign borrowing at the 10 percent confidence level. Taking this at face value, one can project an average weekly decline of US \$32.5 million in foreign debt liabilities<sup>58</sup> over the period in which capital controls were in place (7 May 2007 to 9 October 2008, or 74 weeks). This yields an overall decrease in foreign debt of \$2.4 billion by the end of the controls period, or 1 percent of 2008 GDP. According to Ostry et al.'s (2010) regression,<sup>59</sup> this would be

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<sup>54</sup> Ostry et al. (2010), 9.

<sup>55</sup> Coelho & Gallagher, 16; Clements & Kamil, 17.

<sup>56</sup> Alvaro Concha and Arturo Galindo, "An Assessment of Another Decade of Capital Controls in Colombia: 1998-2008", *Inter American Development Bank* (2009): 13-14. < <http://ssrn.com/abstract=1201878>>

<sup>57</sup> Clements & Kamil, 6.

<sup>58</sup> *Ibid.*, 19.

<sup>59</sup> Ostry et al. (2010), 20.



expected to have reduced the 2008-09 decline in GDP growth by roughly .1 percent, varying slightly depending on the model specification.

One should not put too much stock in this .1 percent figure; it is based on a moderately reliable estimate of the effect of capital controls in Colombia, multiplied by a regression coefficient derived from a much broader sample of countries, and then reapplied to Colombia. Still, it suggests that Colombia's 2007-08 capital inflow controls had little positive effect, and appears to confirm the results from the existing literature about the limited effects and benefits of volume controls (that is to say, controls that do not restrict their focus to the riskiest inflows).

#### B. Thailand (2006-08)

Thailand's experience over the past two decades has been similar to that of Colombia. Thailand was among the world's fastest growing economies from 1985-1994, clocking a remarkable 8.6 percent growth rate.<sup>60</sup> Over this period it also ran large current account deficits; given its fixed exchange rate, the converse of this was a large capital account surplus (i.e. financial inflows).<sup>61</sup> Like Colombia, Thailand grew concerned about the level of inflows, and in particular the risk to its financial system. Constrained by the macroeconomic trilemma discussed above, Thailand attempted to rein in inflows initially with interest rate increases, and subsequently with composition-based capital control measures.

The debate noted above about the effectiveness of such controls – Ariyoshi et al. find a significant effect on both volume and composition, while Jittrapanun and Prasartset

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<sup>60</sup> Wade, 1536.

<sup>61</sup> Ibid.

find none – is somewhat beside the point in this case. The controls were too little, too late. Thailand had already massively borrowed abroad in foreign currency, and asset bubbles fueled by inflows began to pop: property in 1995, stocks in 1996.<sup>62</sup> International investors, who had been lured by the promise of high bond returns and a fixed exchange rate, began to flee in 1997, as fears of depreciation of the Thai baht became a self-fulfilling prophecy.<sup>63</sup> Thailand's economy collapsed, forcing it into IMF receivership, and the resulting shockwaves would continue to rattle emerging markets for the next four years (including Colombia's in 1998).

Like Colombia, Thailand met the financial inflow surge of the 2000s determined to avoid the perceived mistakes of the past. Thailand quickly began to take action against both the appreciation of the baht and the escalating inflows. The Bank of Thailand undertook extensive sterilization action between 2005 and 2007; despite accumulating reserves of over \$100 billion, however, it failed to prevent substantial appreciation and escalating inflows.<sup>64</sup> Such a trend was obviously of enormous concern; Jittrapanun and Prasartset quote a senior Ministry of Finance official: "Thailand's last experience with extensive liberalization of the capital account in the early 1990s shows how easily a small open economy without adequate safeguards can fall victim to the massive speculative inflows."<sup>65</sup>

Thailand responded with an escalating series of inflow control measures during late 2006, in addition to liberalizing outflow controls in 2005:<sup>66</sup>

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<sup>62</sup> Ibid., 1541-42.

<sup>63</sup> Ibid.

<sup>64</sup> Jittrapanun & Prasartset, 26-27.

<sup>65</sup> Ibid., 28.

<sup>66</sup> All from *ibid.*, 29-30.

- (1) November 2006: Prohibiting the sale of baht financial instruments to non-residents
- (2) December 2006: “[P]rohibiting the selling and buying of all types of debt securities through sell-and-buy-back transactions for all maturities.”
- (3) December 2006: URR of 30 percent for one year on all inflows (except for FDI, trade credits, and repatriation of investments); the immediate 20 percent fall in the stock market forced the central bank to exempt equities the following day.

The measures throughout indicate an attempt to restrict the volume of inflows; even if the URR on equity inflows lasted but a day, the demonstrated intent was clear. Furthermore, the measures followed the evident failure of sterilization techniques, indicating their use as an alternative means of curbing appreciation. Jittrapanun and Prasartset also identify ‘hot money’ as “the main motive behind the introduction of the URR”.<sup>67</sup>

There is a degree of consensus between the two studies of Thailand’s recent capital controls, but one has to look quite hard at the underlying methodology to discern it. Coelho and Gallagher find, ironically, that despite the specific exempting of FDI, the URR decreased FDI flows by roughly 1 percent of GDP without affecting non-FDI flows. They attribute this to the uncertainty generated by the Bank of Thailand’s clumsy maneuvering, especially concerning the rapid reversal on portfolio flows.<sup>68</sup> The difference between the impact on FDI and non-FDI flows, however, is not significant, preventing them from identifying a robust effect on composition of inflows. If such a 1 percent decline in FDI took place, this would correspond to roughly .09 percent additional decline in GDP between 2008 and 2009; not beneficial, but hardly significant. Even if FDI has a limited impact on

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<sup>67</sup> Ibid., 31.

<sup>68</sup> Coelho & Gallagher, 16.

crisis outcomes, however, it is certainly the most important category of inflows for long-run growth, and measures that dampen FDI inflows while failing to produce tangible benefit should certainly be judged a failure.

Jittrapanun and Prasartset, meanwhile, do not deny that a drop in FDI took place – buried in a table is evidence of a sharp drop in net FDI from November to December 1997<sup>69</sup> – they are merely uninterested in it, as FDI was not the subject of controls. Rather, they look at the effect on portfolio equity flows and find a significant, albeit temporary drop.<sup>70</sup> Such a finding is somewhat inconsistent with that of Coelho and Gallagher, who find no statistically significant reduction in non-FDI flows. Such a distinction can be attributed to the former authors using an index of capital control intensity, including both inflows and outflows, while the latter authors use a dummy variable for the existence of inflow controls. The disparity is unimportant, as a fleeting impact on portfolio flows is not terribly significant. We can thus conclude that there was an effect on volume of inflows, primarily by reducing FDI, and that there was no *beneficial* change in composition toward either less risky or longer-term flows.

### C. Croatia (2004-08)

Croatia's experience in the 1990s, needless to say, was somewhat different than that of that of Thailand or Colombia. True, as in so many other developing countries, Croatia found growth stalled at the end of the decade, and began the 2000s emerging from recession with a highly liberalized capital account. But Croatia's position was unlike that of Thailand or Colombia for two reasons. First, its position on the periphery of the European Union made

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<sup>69</sup> Thawatchai Jittrapanun and Suthy Prasartset, "Hot Money and Capital Controls in Thailand", *TWN Global Economy Series* 15 (2009): 36.

<sup>70</sup> *Ibid.*, 38.

EU ascension the clear goal of policymakers; candidate status was received in 2005. Second, Croatia's economy is roughly a quarter the size of Thailand or Colombia. The combination of these two factors imposed three significant constraints on the central bank in managing capital inflows. First, preparing itself for eventual entry into the Eurozone, Croatia managed a de-facto pegged exchange rate against the euro.<sup>71</sup> Second, due to its size, proximity, and managed exchange rate, there was extremely high dollarization/euroization; despite declines through the 1990s, 56 percent of deposits were still held in foreign currency in 2009.<sup>72</sup> Finally, its efforts to join the EU bound Croatia's hands in imposing comprehensive controls, as these would indicate an inability to comply with EU rules on free movement of capital.<sup>73</sup>

Faced with rising inflows, Croatia undertook largely successful sterilization measures to manage currency appreciation,<sup>74</sup> yet remained concerned about the structure of inflows. A rapid expansion of household borrowing, largely financed by local branches of foreign banks, was of particular concern.<sup>75</sup> Croatian authorities responded with two measures targeted at foreign exchange denominated transactions:<sup>76</sup>

- (1) July 2004: A marginal reserve requirement (MRR) was imposed on foreign liabilities on top of the standard reserve requirements, requiring a non-interest bearing deposit equal to 24 percent (raised to 55 percent by 2005) at the central bank.

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<sup>71</sup> Peter Bofinger and Christian Schaub, "Monetary Policy under De Facto Dollarization: The Cases of Peru and Croatia" (2009). <<http://www.vwl.uni-wuerzburg.de/fileadmin/12010100/Diplomarbeiten/Schaub-Diplomarbeit.pdf>>

<sup>72</sup> Ibid., 46-48.

<sup>73</sup> Jankov, 127.

<sup>74</sup> Bofinger & Schaub.

<sup>75</sup> Jankov, 127.

<sup>76</sup> Both from *ibid.*, 128-9.

- (2) Mid-2006: Changed accounting standards so that “bank loans in foreign exchange or loans in kuna indexed to foreign currency, granted to un-hedged clients,” were classified as riskier, thus requiring higher capital adequacy and raising the cost of such lending.

These measures were carefully designed to reduce the growth of foreign-financed lending, as well as foreign exchange denominated debt in the economy at large, and to shield banks from the potential effects of a downturn. Though they are quite limited in scope, the targeting of financial institutions and the discrimination based on currency are hallmarks of well-targeted composition controls.

The measures were quite successful in reducing the exposure of Croatian banks: “in 2006 banks' foreign liabilities started to decline because foreign borrowing as the source of banks' funds for domestic lending was replaced by raising new equity capital.”<sup>77</sup> Other macro-prudential policies restricting the growth of household credit also helped tamp down credit growth, and the result by the time the crisis struck was a banking system that was remarkably well-capitalized and free of non-performing loans.<sup>78</sup>

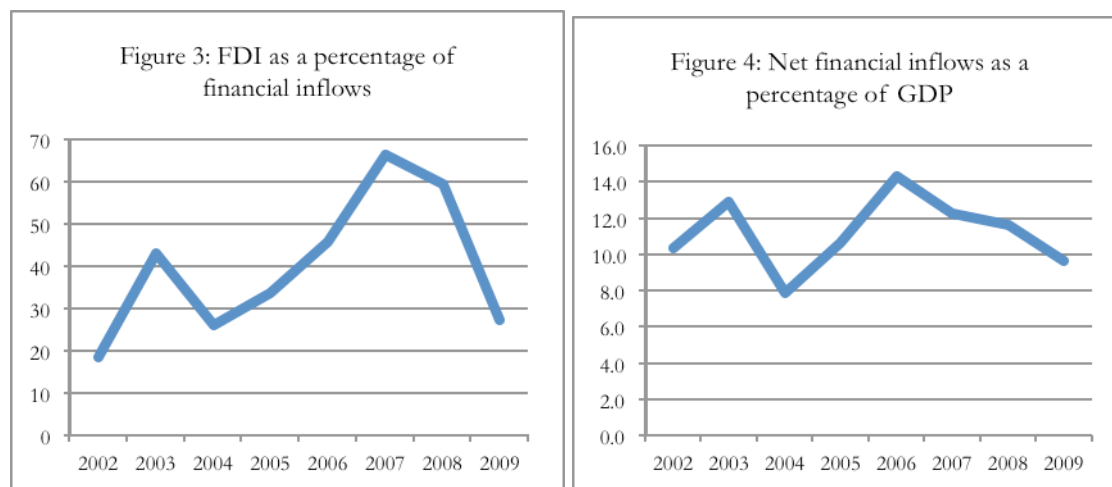
Comparing the effects of Croatia's composition-based controls to Colombia's and Thailand's volume-based controls is difficult given the descriptive nature of Jankov's analysis, which does not break down inflows into the same categories as more empirical studies of the effects of capital inflow controls. I therefore undertake my own analysis, combining data from the Croatian Central Bank (HNB) on foreign liabilities in the financial

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<sup>77</sup> Ibid.

<sup>78</sup> Ibid.

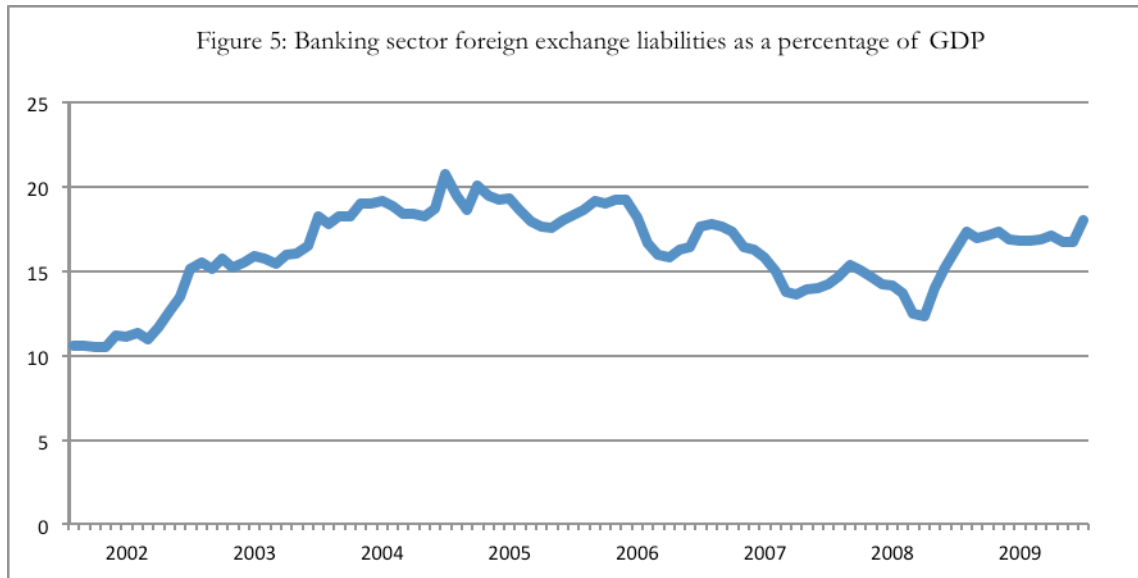
sector<sup>79</sup> and financial flows<sup>80</sup> with IMF data on GDP. While I cannot put in place the sophisticated controls of other papers, the descriptive story seems to confirm a significant role of capital controls in restraining foreign liabilities:



What we see is a dramatic composition effect, as the proportion of FDI in inflows more than doubles over the period of controls (2004-2008) before falling due to the global financial crisis. Meanwhile we see no substantive effect on the volume of inflows, as they rise from 2004-06 but fall from 2006-08. Looking now at monthly foreign exchange liabilities in the banking sector – the single riskiest category of inflows, according to Ostry et al. (2010) – we see a substantial effect following the full imposition of flows in 2006. Liabilities fall from an average of 18.75 percent of GDP from late 2003 through mid-2006, when capital adequacy standards were revised for foreign-denominated loans, to an average of 15.25 percent of GDP from mid-2006 through October 2008, when the controls were abandoned. This 3.5 percent of GDP decrease in liabilities should be read as a minimum; if one extrapolates the rising trend of 2002 to 2004 through 2008, liabilities might have reached over 30 percent of GDP by 2008.

<sup>79</sup> Data from Croatian National Bank <[http://www.hnb.hr/dsbb/biltenske\\_tablice/d10.xls](http://www.hnb.hr/dsbb/biltenske_tablice/d10.xls)>

<sup>80</sup> Ibid. <[http://www.hnb.hr/dsbb/xls-sdds/biop\\_sdds\\_eng.xls](http://www.hnb.hr/dsbb/xls-sdds/biop_sdds_eng.xls)>



While we cannot attribute the *absolute* increase in FDI to the presence of the controls, in evaluating the growth effects during the recession we can apply the data on banking system foreign exchange liabilities to Ostry et al. (2010)'s regression.<sup>81</sup> What we see is that this 3.5 percent of GDP decline in liabilities translates into a .54 percent of GDP increase in 2009 growth relative to the absence of such controls. This is a substantially greater effect than seen in Colombia or Thailand (.1 percent increase and .1 percent decrease, respectively), lending credence to the conclusion that controls targeting specifically risky inflows are more effective than those targeting broad swathes of inflows regardless of relative risk. While the aforementioned caveats about too-literally interpreting these figures apply, the data indicate that Croatia's recession would have been substantially worse but for the composition-based controls implemented over the preceding four years.

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<sup>81</sup> Ostry et al (2010), 20.



## **VII. Conclusion**

It is important to note two limitations of the analysis I have presented here. The most significant is the extremely limited number of cases; I present only four cases of composition controls and four cases of volume controls. This is an inescapable problem in studying national-level economic policy, particular when the measures under consideration are employed as infrequently as capital controls. The second major impediment to studying the effects of economic policy is its discretionary nature; while the removal of capital controls may be partially exogenous in certain cases (due to multilateral agreements or IMF conditions, for example), the implementation of discretionary measures is highly endogenous. In fact, not only are capital controls endogenous, they are what might be termed “dynamically endogenous”: the controls are first implemented in response to underlying conditions; the implementation of the controls may or may not alter those conditions; and then the controls may be adjusted or discontinued if the desired effect is not achieved. Such a continuing feedback loop between the input and output variables frustrates attempts to compare the effects of a given set of controls against either other types of controls or the counterfactual of not implementing controls.

Still, this paper makes three arguments. First, there is a significant and overlooked distinction between capital inflow controls that target specific types of risky inflows – external bank liabilities, foreign exchange denominated liabilities, and short-term debt – and those that target less-risky types of inflows with the intent of reducing the overall volume of inflows. Second, this distinction is meaningful in practice; the design of past capital control regimes can be differentiated along this axis, and the proximate effects of such controls

correspond to the difference in their designs. Third, carefully targeted composition controls are more likely to achieve the desired results than broad volume controls, in doing so are more likely to have beneficial macroeconomic effects. If borne out by further study, these propositions would have two policy implications: that capital inflow controls deserve serious consideration by developing countries as a policy measure to address or even avoid financial dislocation; and that where capital controls are deemed desirable, they should focus on the narrow subset of particularly risky inflows.

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