

# Empirical Evidence on the Efficacy of Capital Controls: A Summary Evaluation

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The sharp rise in financial integration over the past several decades has gone hand in hand with a dramatic increase in overall liberalization of international financial flows. However, almost no economy has completely eliminated capital controls, and in many cases they remain substantial, with officials frequently increasing the intensity of controls during episodes of financial disruption. Moreover, since the 2008–2009 global financial crisis, emerging markets such as Brazil have increasingly imposed capital controls in an attempt to limit surging capital inflows (Pasricha 2011). Capital controls have traditionally been discouraged by such institutions as the IMF but are now gaining wider acceptance as part of the macroeconomic policy and prudential “toolkit” for emerging market policymakers (IMF 2011).

Despite the frequent use of capital controls as a policy tool, there is no general consensus on critical questions regarding the efficacy of capital controls. Data limitations are an important reason for the mixed results on this topic. Most studies have employed aggregate binary indicators of de jure restrictions that are too coarse to distinguish between more subtle variations in capital account regimes. Recent work, with more refined measures, is partly overcoming this limitation (Schindler 2010).

In order to evaluate the efficacy of capital controls, one must first ask about the objectives associated with their use. Capital controls are imposed for a number of reasons, but all are based on the desire to insulate the domestic economy from some form of international capital flow (Dooley 1996). Three main reasons are usually put forward. The first is concern over the impact of large exchange rate movements—either bouts of substantial appreciation or depreciation of the currency—on the real and financial economy, and the hope that various forms of capital controls can help offset these exchange rate pressures. The second is concern over potentially disruptive effects of large and volatile short-term, speculative capital flows (“hot money”). The third concern is over the potential loss of monetary control that may be associated with large capital flows.

To this end, I briefly evaluate these three categories in a very selective review of the literature. This review is admittedly biased towards areas where I have researched.

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### **Have Capital Controls Limited Large Exchange Rate Movements?**

Empirical evidence on the role of capital controls, or conversely capital openness, in protecting countries from currency crises and very large and undesired exchange rate movements is mixed. This is particularly important since recent work on the 2008–2009 financial crisis suggests that emerging markets with greater total external liabilities relative to the size of the economy—one measure of financial openness—experienced greater exchange rate depreciations and loss of reserves (Aizenman and Hutchison 2011).

Several empirical papers have investigated the experiences with capital controls of selected developing countries. Edison and Reinhart (2001a) focus on the recent experiences of Malaysia and Thailand, while Edwards (1999) and Gregorio et al. (2000) examine Chile. In general, these studies have found little effect of capital controls in averting currency crises, at least not without other supporting economic policies. For example, using various econometric tests and a detailed case study of Chilean controls imposed in the 1980s, Edwards (1999) finds that “...the relative absence of contagion effect on Chile (during the currency crises of the 1990s) is due to its sturdy banking regulation and not to its capital controls policy.” This finding is supported by Edwards’ (1989) analysis of the role of capital controls in 39 devaluation episodes for 24 developing countries over the period 1961–1982. He finds that countries typically intensified their control programs in the year before devaluation and concludes that “(a)t most one can argue that these heightened impediments to trade managed to slow down the unavoidable balance of payments crisis” (Edwards 1989, 189–190).

Glick and Hutchison (2005) systematically investigate the link between capital controls (or international payments restrictions generally) and currency stability for a broad sample of developing economies. They also investigate other empirical factors explaining both currency crises and capital account restrictions, and causal linkages between the two phenomena. Their results find a statistically significant positive link between capital controls (measured *de jure* dichotomously as to whether controls are in place or not in place) and exchange rate instability. This result is robust to a variety of specifications and estimation methods that take into account simultaneity issues.

Glick, Guo, and Hutchison (2006) are concerned that earlier results may be biased by self-selection issues—countries facing exchange rate instability are more likely to impose capital controls, hence a positive link between the two phenomena. They introduce a propensity-score matching methods methodology to address the self-selection problem. This method allows a better measurement of the counterfactual (what would have occurred in the absence of capital controls) in estimating the impact of capital controls on exchange rate instability. Surprisingly, their earlier results hold up and support Bartolini and Drazen

(1997a)—countries with capital controls are more likely to experience currency crises.

**Have Capital Controls Influenced the Magnitude and Composition of Capital Flows? Have they Limited “Hot Money” Inflows and Sudden Stops of Capital?**

A number of individual country studies have studied the effects of capital controls on the volume of capital flows, but relatively few multi-country studies have focused on this issue. Magud and Reinhart (2007) review more than 30 studies, only five of which are multi-country studies. The few multi-country studies that have considered the effects of controls have focused on capital inflows rather than outflows (or both). Magud and Reinhart (2007) conclude their survey by stating that studies in this area “...are not very informative regarding the effectiveness of controls in reducing the volume of capital flows and reducing real exchange rate pressures.”

Many *individual country* case studies have considered the effect of controls on capital flow volumes. Overall, most individual studies find that controls do not successfully alter the volume of capital inflows and outflows but do affect, to a limited degree, the composition of capital inflows. To the extent that controls affect net capital flows, these effects are short-lived. A number of studies examine the effects of a specific type of capital control—unremunerated reserve requirements (URR)—on various measures of capital flows. Cardenas and Barrera (1997) address this question for the case of Colombia, and De Gregorio et al. (2000) study the Chilean case during 1991–1998, where URR were aimed at reducing the volume of capital inflows to increase monetary autonomy and to limit the appreciation of the real exchange rate. Both the Colombia and the Chile study find that their measure of capital controls does not affect the level of capital inflows, but that the URR appear to have been effective in tilting foreign liabilities toward long-term maturities. Cardenas and Barrera (1997) argue that the effect of capital controls on the composition of flows has made Colombia less vulnerable to sudden reversals in capital.

Several *multi-country studies* have also investigated the link between capital controls/financial market liberalization and capital flow contractions-reversals-sudden stops using multi-country panel data sets. Eichengreen et al. (2006) find a weak negative association between capital account liberalization and sudden stops in capital controls, but the link is generally not statistically significant. Edwards (2005) also finds some evidence of a negative association between capital account liberalization and sudden stops. In later work, Edwards (2007) finds evidence that capital controls lower the likelihood of capital flow contractions. He uses three alternative measures of capital controls and investigates both “capital flow contractions” (small and medium-sized

contractions in net capital inflows) and sudden stops (major reversals in net capital inflows).

Ariyoshi et al. (2000) review the experience of 14 emerging market countries that used capital controls in the 1990s to address whether capital controls played any role in determining the movement of capital flows. They provide a case-by-case descriptive analysis focusing on the effectiveness of capital controls and the costs associated with them. They do not undertake any formal econometric analysis, but their qualitative case studies suggest that controls on capital inflows were partially effective (in Malaysia and Thailand) in reducing the volume and altering the maturity of flows. Controls on outflows, by contrast, at best only appeared to have a very short-lived effect.

Montiel and Reinhart (1999) focus on the effects of capital controls on both the volume and the distribution of capital inflows, based on an aggregate measure of the intensity of controls. (Their aggregate measure ranges from 0 to 2, with 0 indicating no restrictions and 2 indicating substantial restrictions). Using a panel data set of 15 emerging market economies during 1990–1996 and employing both least squares dummy variable (LSDV) regression and LSDV with instrumental variables, they break down capital inflows into three categories of capital inflows: portfolio inflows, short-term inflows, and foreign direct investment (FDI) inflows. While they do not find any evidence that capital controls impact the volume of capital inflows, capital controls appear to influence the composition of inflows by reducing the share of portfolio and short-term flows in total capital inflows. They do not consider capital outflows nor do they have nuanced measures of capital controls for specific asset classifications.

Lane and Milesi-Ferretti (2003) focus on the determinants of the increase in financial integration, defined as the sum of gross foreign assets and gross foreign liabilities as a percentage of GDP, during the preceding two decades. In a panel data set for 18 OECD countries over 1978–2001 (data averaged over six 4-year periods) and employing LSDV, they regress changes in financial integration on a set of regressors that include a measure of capital controls (capital account liberalization index). Their capital control variable is an aggregate capital controls index ranging from 0 to 4 (with 0 representing stringent controls), based on de jure restrictions reported in the IMF *Annual Report on Exchange Arrangement and Exchange Restrictions* (AREAER) and averaged over each 4-year period. Their measure of capital controls does not distinguish between inflows and outflows or between different types of capital flows, and it does not have independent explanatory power when included in multivariate regressions.

Grilli and Milesi-Ferretti (1995), investigating the effects of restrictions on capital flows in a panel of industrial and developing economies, find that capital controls have a significant negative effect on foreign borrowing. They also find that capital controls are associated with lower domestic interest rates, consistent with the view that they limit international arbitrage in asset markets. Interestingly,

in terms of relaxation of capital controls, Bartolini and Drazen (1997a) survey a number of episodes of capital account liberalization and find that the easing of restrictions on capital outflows often represented early ingredients of a broad set of reforms (including the lifting of various elements of financial repression) and frequently led to large capital inflows. More recently Binici et al. (2009) find that controls in emerging markets may significantly reduce equity capital inflows but have limited effect on debt inflows or capital outflows. They employ a new data set, attributable to Schindler (2009), which allows a detailed decomposition of controls on assets and liabilities of different forms (debt, equity, FDI, bank flows/derivatives) applied to capital inflows and outflows.

Finally, the IMF (2008) takes an intermediate position by considering the effects of policy responses during episodes of large capital (net) inflows on GDP growth and on exchange rate pressures. They find that capital controls do not seem to be effective in reducing vulnerability to inflow reversals. However, because their sample begins in the late 1980s, they cannot meaningfully distinguish between inflow and outflow controls.<sup>1</sup>

### **Have Capital Controls Increased Monetary Autonomy?**

Despite narrow success in limiting currency instability or aggregate capital flows, the empirical evidence is quite supportive of capital controls decoupling, at least temporarily, domestic interest rates from foreign interest rates and providing some measure of monetary autonomy. This work usually takes the form of measuring short-term interest differentials that are indicative of differing domestic and foreign monetary policies.

There is a long empirical literature in this area. Studies that have estimated deviations from covered interest parity (CIP) as an indication of international financial market integration in various contexts include Frenkel and Levich (1975), Grilli and Milesi-Ferretti (1995), Peel and Taylor (2002), and Obstfeld and Taylor (2004). For example, Grilli and Milesi-Ferretti (1995) find that capital controls are associated with lower domestic interest rates, consistent with the view that they limit international arbitrage in asset markets and contribute to monetary autonomy.

Recent work by Ma and McCauley (2008) argues that capital controls adopted by the People's Republic of China (PRC) remain substantially binding, allowing the Chinese authorities to retain some degree of short-term monetary autonomy, despite the fixed exchange rate, up to July 2005. Although capital controls of the PRC have been circumvented to some extent, they find sustained and significant gaps between onshore and offshore renminbi interest rates and persistent dollar/renminbi interest rate differentials during the period of a de facto

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<sup>1</sup>The IMF's AREAER started to systematically differentiate between inflow and outflow controls only in 1995.

dollar peg. While some cross-border flows do respond to market expectations and relative yields, they have not been large enough to equalize onshore and offshore renminbi yields.

Using a similar approach, Hutchison, Pashrica, and Singh (2011) consider yield differentials in India and the PRC. They analyze the extent to which the effectiveness of international capital controls in India have changed over time by analyzing daily return differentials in the non-deliverable forward (NDF) markets using a methodology that allows for arbitrage to work outside of certain thresholds (due to transaction costs and capital controls). Inside the bands, small deviations from CIP follow a random walk process. Outside the bands, profitable arbitrage opportunities exist and they estimate an adjustment process back towards the boundaries. They identify several distinct periods reflecting changes in capital control application and intensity for India and estimate the model over each subsample in order to capture the de facto effect of changes in capital controls on return differentials over time. They find that (i) capital controls are asymmetric over inflows and outflows, (ii) controls have changed over time from primarily restricting outflows to effectively restricting inflows, and (iii) arbitrage activity closes deviations from CIP when the threshold boundaries are exceeded in all subsamples. It is noteworthy that the no arbitrage bounds have collapsed in the last couple of years, indicating that international financial liberalization—in part the relaxation of capital controls—has made the linkage between Indian financial markets and those abroad much tighter. As a robustness test of the methodology, Hutchison, Pasricha, and Singh (2011) apply it to the Chinese RMB NDF market and also find that capital controls vary over time and are effective. Capital controls in the PRC remain effective in allowing a high degree of domestic monetary autonomy.

### **Concluding Remarks**

Overall, evidence on the effectiveness of capital controls in warding off currency crises and sudden stops is quite mixed. The evidence is more supportive of slowing aggregate flows of capital in the desired direction but most importantly in the area of shifting the composition of capital flows towards longer maturity flows. The strongest evidence, however, is that capital controls appear to give domestic monetary authorities some autonomy, based on widening interest rate differentials under capital control regimes. This provides support to the idea that capital controls may be used to some effect in helping maintain monetary control in the face of strong outflows or inflows of financial capital. Most of the evidence points to temporary effects of controls, so presumably controls would be most effective as a short-term policy tool designed to complement other measures.

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