Why do emerging markets liberalize capital outflow controls?

Fiscal versus net capital flows concerns

Joshua Aizenman and Gurnain Kaur Pasricha[1]

5 December 2012
[Preliminary and Incomplete – Please do not cite.]

Abstract

Most of the recent policy debate on the appropriateness of capital controls has focussed on the use of capital inflows controls in the face of surges in net capital inflows. However, countries that have existing capital outflows controls have another potential tool to reduce net capital inflows (NKI) - the liberalization of outflows. It follows that the decision to liberalize outflows controls in response to surging inflows could potentially involve weighing the benefits of reducing NKI through reduced inflows or increased outflows, the relative effectiveness of inflow and outflows controls, their relative impact on domestic actors, as well as the (permanently) lost revenues from financial repression. In this paper, we weigh the evidence on these complex motivations for capital outflows controls policy by examining the various macroeconomic and fiscal factors at the time that outflows controls were liberalized. Our results indicate that concerns related to net capital inflows took predominance over fiscal concerns in the decision to liberalize capital outflows controls in the 2000's. Emerging market economies (EMEs) tightened outflows controls after sudden stops and high volatility in net capital inflows and eased outflows controls when inflation pressures became important. Countries eased more in response to higher net capital inflows and when these translated into higher appreciation pressure in the exchange market, higher real exchange rate volatility and greater accumulation of reserves. Unlike the 1980's, we find very limited importance of fiscal variables in explaining liberalization of capital outflows controls. This lack of association is consistent with the decline in repression revenues and growth accelerations for EMEs in the 2000's.

Keywords: capital controls, revenues from financial repression, capital flows.

JEL Classifications: F32, G15

Joshua Aizenman
USC and the NBER
Robert R. and Katheryn A. Dockson Chair in Economics and International Relations
Los Angeles, CA 90089, USA
aizenman@usc.edu

Gurnain Kaur Pasricha
Bank of Canada and Santa Cruz Institute for International Economics
234, Wellington Street,
Ottawa, ON K1A 0G9, Canada
gpasricha@bankofcanada.ca

[1] We would like to thank Jamshid Mavalwalla for research assistance. We also thank Yothin Jinjarak for useful comments and suggestions. The views expressed in this paper are those of the authors. No responsibility for them should be attributed to the Bank of Canada or the NBER.

Ph: +1 (613) 782 7159

I. Introduction

The recent years have seen a re-emergence of the policy debate on the appropriateness of capital controls. Opponents of capital controls argue that these controls lead to local and global mis-allocation of resources, perpetuate global imbalances by allowing countries to maintain undervalued exchange rates and in any case, have not been found in empirical literature, to be particularly effective. Open capital accounts, the argument goes, allow efficient global allocation of resources and risk and increase investment, competition and financial sector development in the recipient countries. Proponents of capital controls, which include some EME policymakers, have argued in G20 and other policy forums that capital controls are macro-prudential measures and can be an important tool to prevent build-up of financial sector risks and to reduce the damage associated with sudden stops.[2] Most notably, the IMF softened its longstanding opposition to capital controls, and now suggests that such controls may be a valid tool of macroeconomic and macroprudential management under certain circumstances (IMF, 2011a).

While the debate on what emerging economies should and should not do continues, there has been little attempt in the literature to systematically examine the actions of emerging markets, to analyze what macroeconomic and financial pressures have most often induced these emerging markets to in fact impose controls.[3] Further, most of the recent policy debate has focussed on use of capital inflows controls in the face of surges in inflows and the empirical literature has focussed on evaluating the effectiveness of such inflows controls.[4] However, countries that have existing capital outflows controls have another potential tool to reduce net capital inflows (NKI) - the liberalization of outflows. This tool was discussed in the literature on managing capital flows of the 1990's (see Laban and Larrain (1997) and references therein), but it has been missing from the recent debate. This omission is significant in the light of recent research in Pasricha (2012) which suggests that liberalizations of outflows controls were the largest share of net capital inflow reducing measures in 22 EMEs between 2004 and the onset of the 2008 financial crisis, when the surge in net capital inflows to EMEs was of a comparable magnitude to the post-2008 crisis surge, whereas inflow tightening measures became primary tool of restricting net capital inflows (NKI) only after the 2008 crisis.

The use of capital outflows liberalizations in capital flow management policy may be complicated by the fact that outflows controls exist not only for reasons of managing capital

[2] South Korea's "President Lee Myung-Bak, in an interview with the Financial Times published on Oct. 29, said any measures that the country may take to smooth cross-border capital flows should not be interpreted as capital controls but 'macro-prudential policies'." Factbox – South Korean Policymakers' remarks on capital controls, Reuters, 12 November, 2010.

[3] Recent work by Fratzcher (2012) examines this question for overall capital account openness in a broad sample of emerging and advanced economies over the period 1984-2009. He finds that foreign exchange policy objective and overheating concerns have been the two main motives for capital controls, particularly since 2000.

[4] See, for example, Ostry et. al. (2011), Klein (2012), Hutchison et. al. (2012), Patnaik and Shah (2012) and Warnock (2011).

flows but also to reduce fiscal pressures. Sustained capital outflows controls often form a part of a web of regulations constituting "financial repression", which are aimed at reducing the cost of funding government debt overhang, raising hidden fiscal revenues, and protection of key stake holders in the domestic financial system. Giovannini and de Melo, in a seminal 1993 paper published in the American Economic Review estimated revenues from repression for 24 emerging and developing economies over the period 1972-87, and found these to be substantial – averaging about 9 percent of total government revenue from non-repression sources. The early 1990's literature that examined the motivations for imposing capital outflows controls found fiscal reasons to be the most important (Dooley, 1996 and Eichengreen, 2001). It follows that the decision to liberalize outflows controls in response to surging inflows could potentially involve weighing the benefits of reduced NKI through reduced inflows or increased outflows, the relative effectiveness of inflow and outflows controls and the relative impact on domestic actors, as well as the (permanently) lost revenues from financial repression.

In this paper, we weigh the evidence on these complex motivations for capital outflows controls policy by examining the various macroeconomic and fiscal factors at the time that outflows controls were liberalized. We address the question of which motivations were most closely associated with outflows liberalizations or tightening of controls, in the decade of the 2000's. Pasricha (2012) collected data on all changes in capital account regulations in 22 large EMEs and showed that these regulations underwent numerous and significant changes over the period 2004-2010. This dataset provides a *de-jure* assessment of policies towards financial integration. We use an extended version of this novel dataset on capital flow measures to examine the various macroeconomic and financial characteristics of countries before and at the time that outflow controls were changed, over the period 2001-2010. The broad majority of changes with respect to outflows controls during this period were liberalizations.

Another contribution of our paper is that we update Giovannini and de Melo's estimates of revenues from repression for 15 countries, and find that in contrast to the 1980's when many EMEs were found to be earning significant revenues from repression, averaging 1.4% of GDP, EMEs in the most recent decade earned negative revenues from repression on average. The decline in repression revenues has occurred despite the fact that emerging economies, notwithstanding the liberalizations over time, continue to maintain significant restrictions on capital outflows.

Our results indicate that concerns related to net capital inflows took predominance over fiscal concerns in the decision to liberalize capital outflows controls in the 2000's. EMEs tightened outflows controls after sudden stops, and high NKI volatility, while they eased when NKI, real exchange rate appreciation pressures, reserves accumulation and inflation were high – all pointing to concerns about foreign exchange valuation and domestic overheating concerns. Unlike the 1980's, we find very limited importance of fiscal variables in explaining liberalization of capital outflows controls - only in the sample of non-inflation targeting countries, do we see a

negative association of greater repression revenues with easing of outflows. This lack of association is consistent with the decline in repression revenues for EMEs in the 2000's. The 2000's saw the growth accelerations of emerging markets (in comparison to the 1980-1990s), which led to a decline in their risk premia. The 2000's were also a decade of real exchange rate appreciation pressures in EMEs and overall improved stances of their fiscal policies through deeper collection of taxes from a broader base. Revenues from repression therefore became less important in the decision to liberalize outflows.

The paper is organized as follows: in the next section, we elaborate on the potential motivations for imposing capital outflows controls, outlining the hypotheses we test later in the paper. Sections III and IV describe the construction of and trends in the two main data series compiled in the paper – the changes in capital outflows controls and repression revenues, respectively. Section V outlines the econometric methodology, section VI presents the results and section VII concludes.

II. Potential motivations for capital outflows controls

Many motivations have been advanced in the literature for imposing or liberalizing controls on outflows. Capital outflows controls have often been imposed, at least temporarily, in response to depreciation pressures in times of inflation, sovereign debt or financial crises and a run on the currency. However, outside of crisis periods, one of the principal motivations for sustaining capital outflows controls is that such controls allow governments to lower the domestic cost of borrowing for themselves and for their preferred sectors by keeping domestic savings at home. Further, controls on outflows facilitate the use of other measures constituting financial repression – like interest rate ceilings, high reserves requirements etc, by preventing capital flight in response to such restrictions - thus allowing governments to further depress their borrowing costs. Giovannini and de Melo (1993) showed that when countries faced constraints on their ability to raise revenue through taxes, financial repression could be the optimal choice. They also showed that for some 24 emerging and developing economies over the period 1972-87, revenues from repression were substantial – averaging about 9 percent of total government revenue from non-repression sources – and therefore posed potentially a major constraint towards liberalizations of the capital account. Outflows controls can also help governments maximize the inflation tax by limiting the ability of residents to shift to foreign assets.[5] Aizenman and Guidotti (1994) also argued that capital controls may be desirable in developing countries when collection costs associated with taxes other than the inflation tax are high.

Empirical work in the 1990's underscored the importance of fiscal policy as a motivation for imposing capital controls. Grilli and Milesi-Ferretti (1995) found that fiscal considerations – high shares of government revenues from seigniorage and low interest rates – were key

[5] See Dooley (1996) and Eichengreen (2001) for excellent surveys of the literature on these motivations.

determinants of capital controls and that presence of such controls had significant impact on government revenues. Alesina et. al. (1994) also found that maintaining capital controls led to lower stock of government debt, presumably through lower debt service costs, and those countries with weaker central banks, and therefore lower resistance to use of inflation tax, are more likely to be using capital controls. Recent work by Reinhart et. al (2011) also suggests that financial repression played an important role in the rapid reduction of public debts in advanced economies in the post-WWII era.

For countries that have legacy capital outflows controls, as was true for many emerging economies entering into the new millennium, the decision on whether and when to liberalize these controls can depend on fiscal reasons discussed above or on exogenous political factors, but can also be motivated by economic pressures. In particular, liberalization of capital controls can be motivated by their use as tools for managing macroeconomic and financial pressures arising from the size and volatility of net capital inflows. In periods of surges in net capital inflows, policymakers may choose to either tighten controls on inflows or to liberalize controls on outflows, in order to reduce the size and volatility of net capital inflows. The various concerns arising from rapid increases in NKI can be grouped into 4 main categories: concerns about overheating, concerns about foreign exchange valuation, concerns about financial stability and concerns about macroeconomic volatility.

Net capital inflows to emerging markets are often procyclical, increasing when the economies are booming and retreating when the economies are slowing (Kaminsky et. al. , 2005) Surging capital inflows in periods of high economic growth can therefore lead to overheating concerns by further boosting growth, domestic credit expansion and inflationary pressures. Net capital inflow surges can also lead to overvaluation of the exchange rate, thus hurting export competitiveness. They can also exacerbate asset price booms in real estate or financial markets, thus giving rise to financial stability concerns. Finally, having resident holdings abroad that can be liquidated at times of slowing economic growth can counter stops in gross inflows by non-residents, thus reducing overall volatility of net capital inflows. This channel has been shown to be historically important in mitigating the volatility of net capital inflows in high income economies in recent studies of gross capital flows (Broner et. al. 2011; IMF 2011b).

In this paper, we test all of these hypotheses, for 18 large emerging economies, over the period 2001-2010. The next section describes the evolution of capital controls in the last decade in these emerging markets. Since fiscal reasons were found to be important motivators of capital outflows controls in the past literature, we devote section IV to describing the revenues from repression in our sample period.

III. Evolution of capital controls policy in 2000's

In order to analyze the motivation for liberalizing capital outflows, we use a unique dataset that contains changes in capital account regulation affecting outflows for 22 major EMEs between 2000 and 2010. This dataset is an expanded version of the data used in Pasricha (2012).The main source of data is IMF Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER). The AREAER provides information on member countries' exchange arrangements, exchange and trade restrictions and capital transactions. We focus on the capital transactions section which includes regulations applicable to the financial sector that are relevant for capital transactions. In addition, the AREAER information is supplemented with information on similar measures from central banks' and other country regulators' websites, news sources and other research papers.[6]

The dataset provides information on the changes in capital inflows and outflows regulations, by date of announcement and effectiveness (where the two differ). We classify each change as representing either an easing or a tightening of policy and then count the number of easings and tightenings per quarter. The number of measures per se does not allow us to judge the impact of the measures or to differentiate them by their degree of restrictiveness, which varies between countries. However, since most measures in the database are of relatively homogeneous magnitude, we think our approach, although imperfect does provide useful information about the overall direction of policy, and about the attempts to liberalize or to close the capital account.

This dataset adds information to what is available through the existing measures of capital account restrictions. Of the indices for which data is available for at least part of the 2000's, the Chinn-Ito (2007) index, Edwards (2007) index and Quinn index (1997) do not distinguish between restrictions on inflows and outflows. Schindler (2009) index provides information on degree of restrictiveness of policy towards inflows and outflows separately, but the dataset only covers the period 1995-2005. Further, the Chinn-Ito, Edwards and Schindler's indices only provide information on the existence or absence of regulations under broad or narrow categories of controls, but do not allow for changes in degree of restrictiveness under each category of transactions. The dataset used in this paper provides information both on the changes in restrictions under each category of transactions as well as on whether the restrictions relate to inflows (by non-residents) or outflows (by residents). In this paper, we focus on explaining the changes in capital outflows controls.

The database provides information on capital controls policy for the 21 emerging markets that are in the MSCI Emerging Markets Index, and Argentina. However, for the purpose of this paper, we drop the 3 eastern European countries, Czech Republic, Hungary and Poland, as their capital account liberalizations were determined by their EU accessions, rather than by any

[6] Further information on the dataset is provided in Appendix A.

economic factors. We also drop changes in Argentina before 2003, in order to include in the sample only relatively homogeneous or marginal changes in policy.[7]

The emerging markets in sample changed their capital outflows policies 302 times over the period 2001-2010, of which the broad majority, or 274 changes, were easing of restrictions. Since countries could be easing and tightening restrictions on outflows in the same quarter, to gauge the net direction of policy, we compute "net easings of outflows" as the difference between the number of outflows easing measures and the number of outflows tightening measures. We use this as our main dependent variable in this paper. The peak year for net easing of outflows restrictions was 2007,which was also the year in which net capital inflows (NKI) as a ratio of these EMEs peaked (Figure 1). Since both outflows easings as well as inflows tightenings would tend to reduce the pressure of net capital inflows, we group the measures into whether the measures would encourage or discourage Net Capital Inflows (NKI), i.e. the difference between inflows and outflows, as in Pasricha (2012). This gives us the following categories:

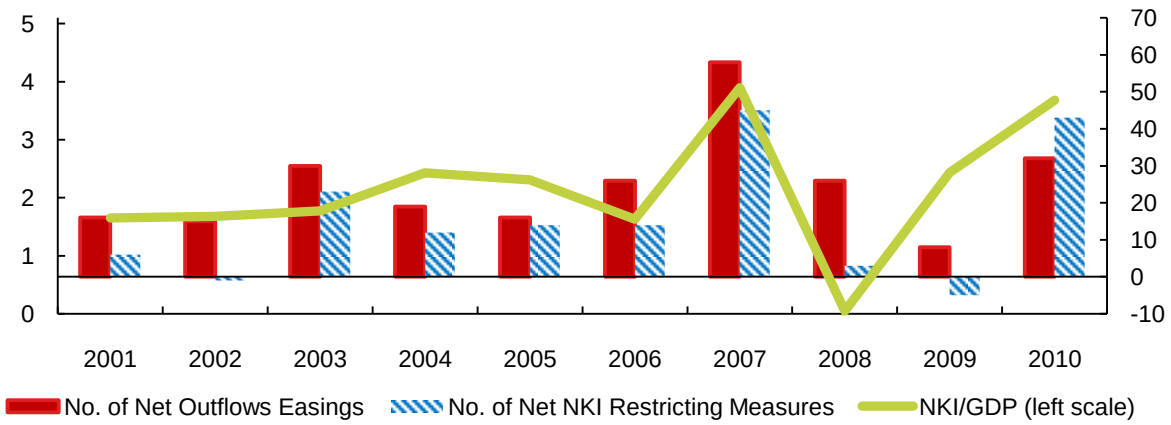
1. NKI Reducing Measures: These are measures that represent tightening of inflows, easing of outflows or other tightening.
2. NKI Increasing Measures: These are measures that represent easing of inflows, tightening of outflows or other easing.
3. Net NKI Restricting Measures = NKI Reducing Measures - NKI Increasing Measures

Figure 1 shows that net NKI restricting measures peaked both in 2007 and 2010, both peak years for net capital inflows pressures to EMEs, and that outflows liberalizations were the predominant tool for restricting inflows in the 2007 peak, but less so in 2010.

The propensity to change capital outflows controls also varied by the monetary policy framework and by flexibility of the exchange rate regime (Table 1). EMEs with inflation targeting (IT) monetary policy and freely floating exchange rates tended to liberalize outflows less frequently (perhaps because they were already more open, as discussed in more detail in Section VI).

[7] Appendix Table A.2 in Pasricha (2012) provides a list of measures taken by EMEs in 2010, which attests to their small magnitude.

Figure 1: Net outflows easings peaked in 2007, along with net capital inflows



Note: Net capital inflows/GDP is the unweighted sum of NKI to the 18 EMEs in sample divided by the unweighted sum of their nominal GDPs. Net outflows easings are the number of easings of outflows less number of tightening of outflows. Net NKI restricting measures are the sum of net outflows easings and net inflows tightenings.

In the subsequent sections, we ask whether the frequency and timing of the net liberalizations of outflows was contingent on fiscal, macroeconomic and financial pressures in the economy in question, focussing in particular on the fiscal revenues that the governments were obtaining from financial repression.

IV. Repression Revenues in EMEs

Since the purpose of financial repression is to keep the domestic cost of borrowing for the government below the rate that would prevail in a fully liberalized and integrated economy, repression revenue can be defined as the additional cost the government would have to bear to service its domestic debt, in the absence of financial repression. Repression revenue is therefore measured by the difference between the effective interest rate on the government's foreign borrowings less effective interest rate paid by the government on domestic borrowing, times the repression tax base which is the government's domestic debt (Giovannini and de Melo, 1993).

The domestic interest rate is computed as:

$$i = \frac{Interest\ Payments\ on\ Domestic\ Debt_{\ t}}{(Domestic\ Debt\ Outstanding_t + Domestic\ Debt\ Outstanding_{t-1})/2}$$

where interest payments and debt outstanding are measured in local currency units (LCU). The effective external interest rate on government debt has two components: the nominal (US) dollar interest rate on foreign debt and the foreign exchange component (defined as the increase in

dollar interest payments due to depreciation of the domestic currency against the dollar) These components are defined as follows:

1. Nominal dollar interest rate on external debt

This is computed as the nominal dollar interest payments, including increases in interest arrears, divided by the average outstanding external debt measured in USD.

$$i^* = \frac{Interest\ Payments\ (USD)_t + Increase\ in\ Interest\ Arrears(USD)_t}{(Debt\ Outstanding\ (USD)_t + Debt\ Outstanding\ (USD)_{t-1})/2}$$

The nominal dollar interest rate is computed on non-concessional public and publically guaranteed (PPG) external debt from private creditors.[8]

2. FX component

The foreign exchange component is computed as the percentage depreciation of average annual exchange rate times the nominal dollar interest rate on external debt and captures the increase in interest payments in dollars, due to depreciation of the domestic currency against the USD.

$$FX\ component \quad = i^*.(Percent\ Depreciation\ of\ LCU/USD\ exchange\ rate)$$

The effective external interest rate is computed as the sum of the above two components.

In addition, two other components of the effective interest rate on external debt are the change in local currency value of the stock of external dollar denominated debt due to change in the value of local currency against the dollar, and the USD revaluation cost, defined as the increase in dollar value of debt outstanding (repayable) due to appreciation of the dollar against the currencies of denomination of external debt. We call these the debt revaluation costs. Both these represent accrued cost and are amortized over the duration of the loan, rather than over the course of a single year. In this paper, our base measure of repression revenues includes only the nominal dollar interest rate and the FX component. While we also compute the debt revaluation costs (and provide some summary statistics on the repression revenues including these costs), we do not include them in our measure of repression revenues. The reason is that without knowing the maturity of the debt and the repayment schedule we would add a very large and volatile component to the repression revenues by including debt revaluation costs.[9]

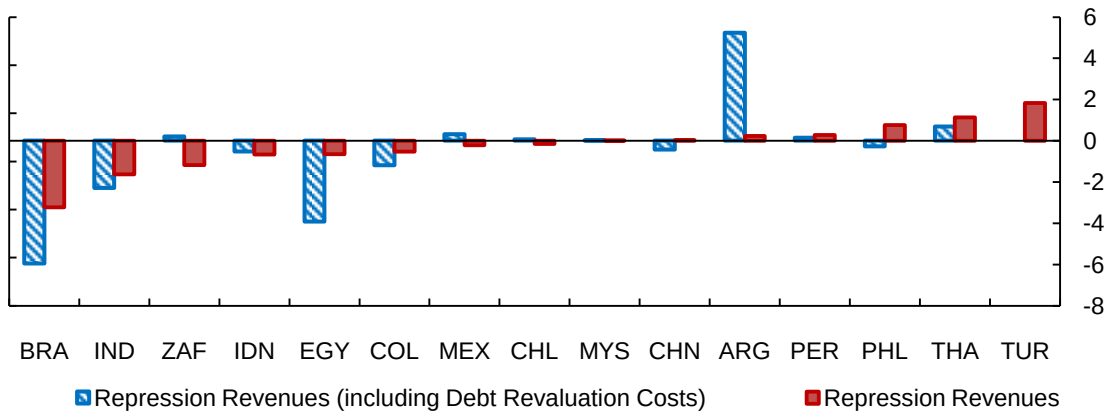
[8] However, interest arrears were available only for total debt from private creditors (including non-PPG debt) and on total PPG debt (including bilateral and multilateral concessional debt). In all cases, the arrears on total PPG debt were higher than arrears on total debt from private creditors. Therefore, as an approximation, we used the arrears from total debt from private creditors. Further, interest arrears should be adjusted for reschedulings. However, we do not have data on forgiveness/reschedulings on PPG debt from private creditors, and our measure currently does not adjust for these.

[9] When Giovannini and de Melo (1993) computed repression revenues, the USD revaluation component was very small, as most external debt of emerging markets was denominated in USD. In our sample, the USD revaluation component turns out to be large and volatile. This may be due to changes in currency composition of external debt

Another key area in which our measure differs from Giovannini and de Melo is that they use only central government external and domestic interest commitments. Due to data constraints, we use public and publicly guaranteed (PPG) debt for external interest rate, and the broadest level of government for which data is available, for domestic interest rate. Since central government debt usually carries the lowest risk premium, the use of interest on PPG debt would tend to inflate our estimates of repression revenues. However, as we will see below, even at these inflated levels, for most EMEs in our sample period, the repression revenues were in fact negative, in contrast to Giovannini and de Melo.

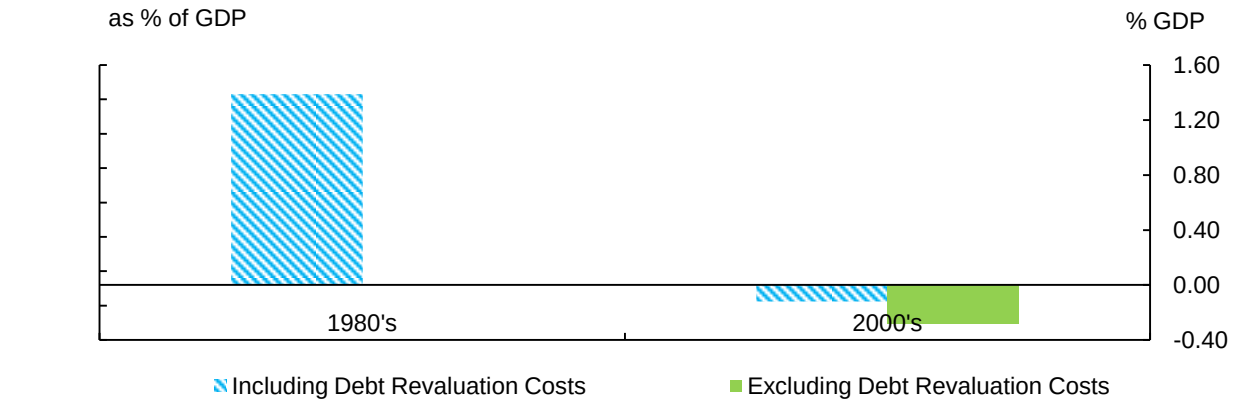
The median repression revenues in the 2000's for 8 of the 15 countries for which we had data, were negative (Figure 2). For another 5 countries, the median revenue as a percentage of GDP was less than 0.5% of GDP. These represent significant declines from the 1980's, when Giovannini and de Melo estimated the average revenue to be about 1.4% of GDP (Figure 3).

Figure 2: Median Repression Revenue, 2000's (% of GDP)



of EMEs and due to greater flexibility of their exchange rates, but it may also be due to the fact that due to lack of data, our current measure of revaluation costs does not adjust for debt rescheduling/forgiveness.

Figure 3: Average Repression Revenues, 1980's vs. 2000's



Notes: The 1980's mean is from Giovannini and de Melo (1993) and covers the countries in their sample that overlap with ours. The averages for 2000's include repression revenues for Argenitna in 2001-02. The 1980's estimates are infaact over the years between 1974-87 over which the Giovannini and de Melo estimates are available.

Another key characteristic of the repression revenues in the 2000's is that the exchange rate component is a small part of effective interest rate differentials for most EMEs, and most of the difference in effective interest rates is due to the difference between external dollar interest rate and domestic interest rate (Figures 4 and 5).

Figure 4: Exchange rate component of repression revenues is small for most countries in sample.

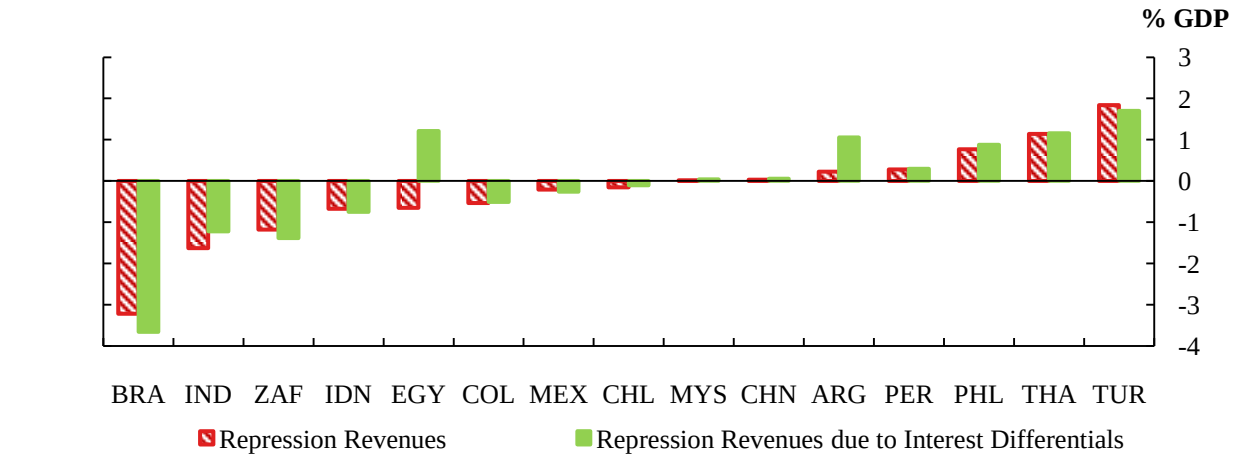
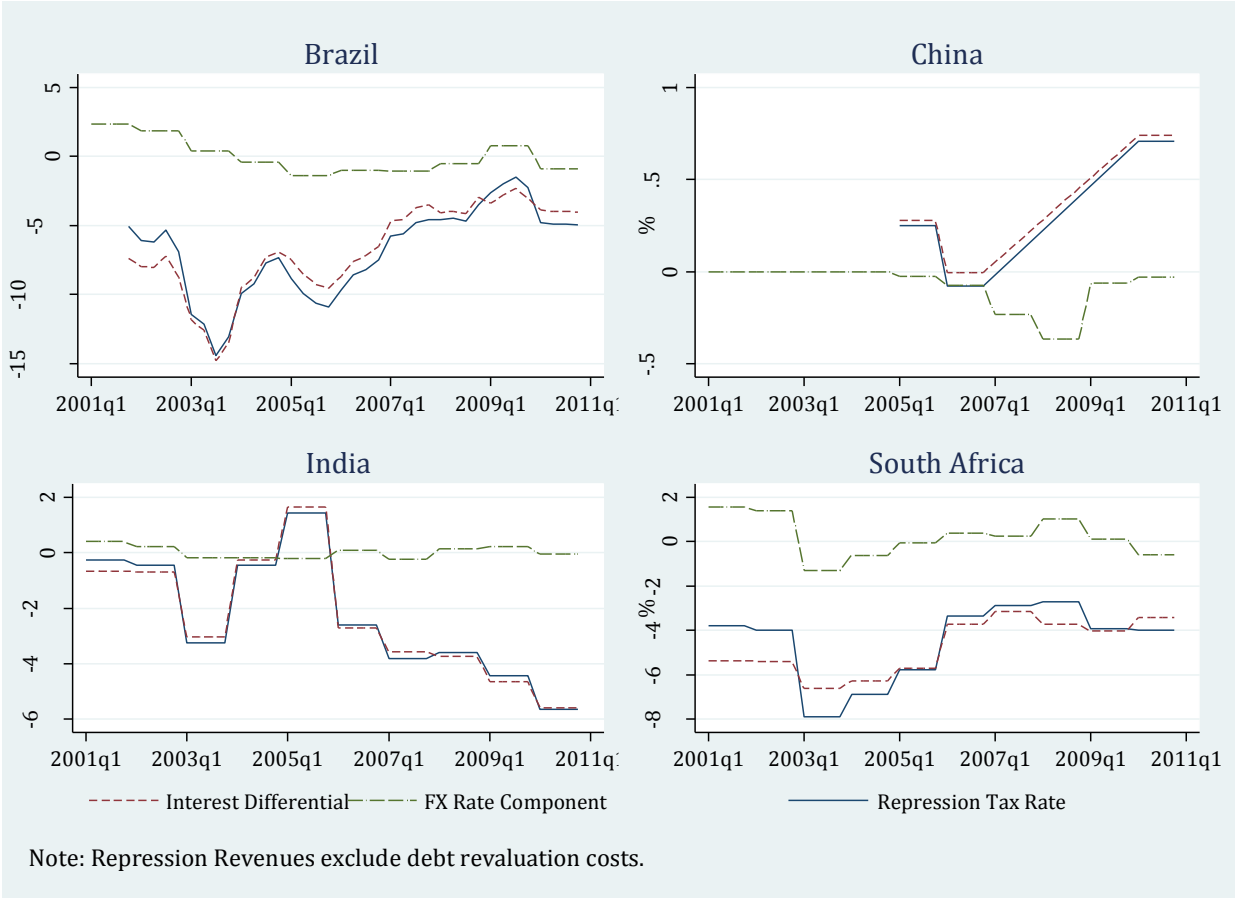


Figure 5: Components of Repression Revenues – BRICS

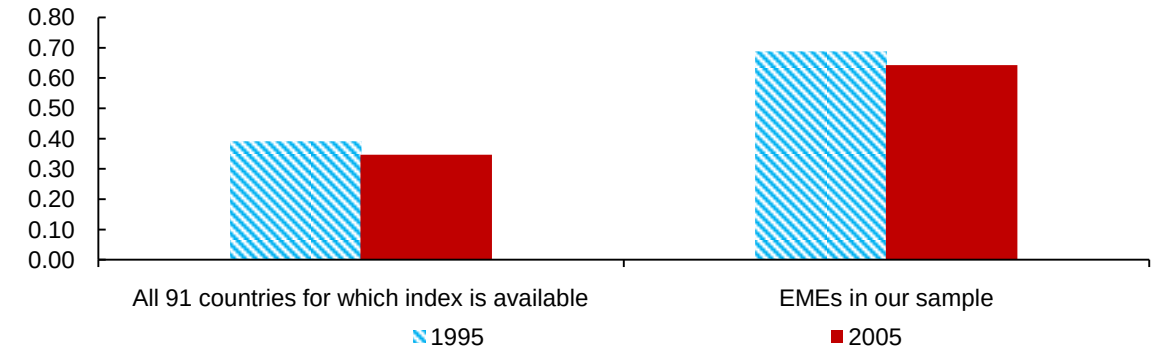


Note: Repression Revenues exclude debt revaluation costs.

The decline in repression revenues has occurred despite the fact that emerging economies continue to maintain significant restrictions on capital outflows, although they have liberalized over time (Figure 6).[10] Several factors can explain the decline in repression revenues, many of them related to the growth accelerations of EMEs in 2000's (in comparison to the 1980-1990s). The superior growth performance of EMEs was reflected in an overall decline in their risk premia and real exchange rate appreciation trend, which contributed to the decline in FX component. The decline in repression revenues could also be explained by the fact that EMEs were more open through trade, and more open to both inflows as well as outflows in 2000's than they were in 1980's (Table 2). These factors led to an increase in their de-facto openness and possibly reduced the effectiveness of their outflows controls.

[10] While we do not have data for capital outflows restrictions in EMEs for 1980's, as Schindler's index only starts in 1995, the level of restrictions on outflows in the 1980's was higher in the 1990's.

Figure 6 Schindler's Index of Capital Account Restrictions

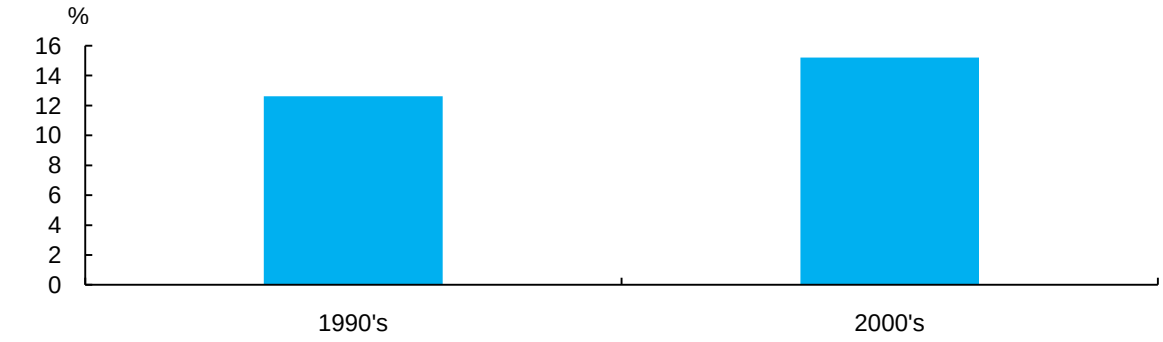


Source: Schindler (2010)

Last observation: <Date of Last Observation>

The fact that EME growth was stronger and less volatile in 2000's may have also led to a lesser need for repression revenues. Indeed, the average tax-GDP ratios for EMEs increased by 2 percentage points to 15.2% of GDP in 2000's from the 1990's (Figure 7).[11]

Figure 7: Average Tax-GDP Ratio for EMEs



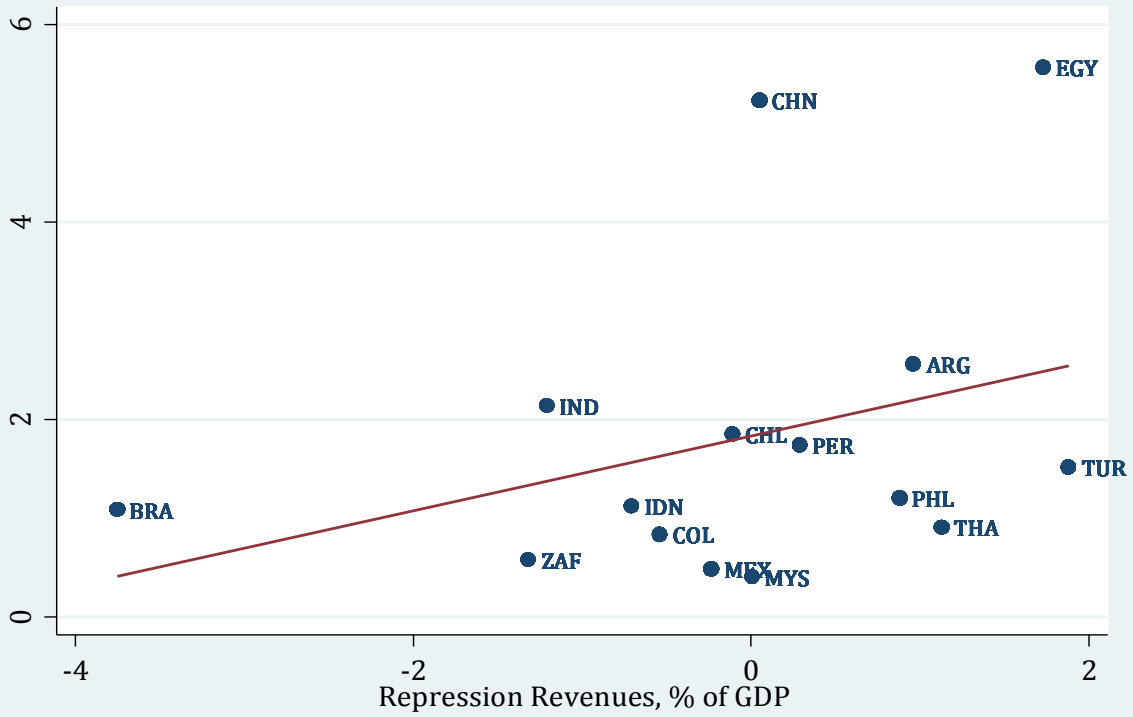
Source: World Bank WDI

A caveat to our estimates is that they may overstate the decline in the fiscal role of financial repression, for several reasons. First, we overlook the impact of financial repression on the inflation tax and seigniorage. Many EMEs impose large reserves requirements for their financial institutions. The sizable reserve requirements in the banking system may be justified as precautionary and sterilization measures, yet they also increase the seigniorage tax revenue. Even though repression revenues have declined to negative on average in 2000's, seigniorage revenues continue to be large and positive (Figure 8).[12]

[11] Among the intriguing developments has been the relative decline in the role of 'easy taxes to collect' [like tariff and inflation taxes], and the rise of the role of Value Added Taxes [see Aizenman and Jinjarak (2009) and Bird and Gendron (2011)].

[12] Seigniorage revenues are computed as the quarter-on-quarter change in reserve money (or where unavailable, Monetary Base or Base Money) divided by the nominal GDP. Figure 7 is comparable to Figure 1 in Giovannini and de Melo (1993), but shows a stronger relationship between seigniorage and Repression Revenues. Increase in high powered money can be associated with an increase in inflation or increase in real GDP. It is likely that in the 1980's the increase in seigniorage was associated with high inflation rather than high growth, whereas in the 2000's, the

Figure 8: Seigniorage and Repression Revenues.



Note: Variables are country means. Seigniorage is defined as the percentage quarter-on-quarter change in Reserve Money divided by nominal GDP.

Further, our measure of repression revenues uses the external and domestic interest rate differential on government debt, under the assumption that the external interest rate represents the "market interest rate" for government debt that would prevail in absence of outflows controls and other forms of financial repression, like high reserves requirements and low ceilings on deposit rates. This assumption ignores the fact that several EME governments, particularly India and China, raise a very small share of their total debt (if any) in markets abroad. As a result of the pervasive financial repression measures, they are able to finance their borrowing needs largely domestically, without pushing up interest rates on their debt and their debt burdens. Therefore, the market interest rate they face in the absence of financial repression could be substantially underestimated by the external interest rate as the governments' fiscal positions would look less sustainable and risk premium on government debt would be higher in the absence of these restrictions (the demand curves the governments face would be steeper).[13] Finally, our measure of financial repression does not take into account the costs imposed on households that accrue to corporations or banks, rather than to the governments.

---

opposite is likely the case. Reserve Money is IFS line 14 (or IFS series code FMR), Monetary base is IFS series code FASMB and base money is IFS series code FMA.

[13] History suggests that just as the European periphery debt was overvalued in the years after the launch of the Euro, it may be the case that EME external debt may seem overvalued in the 2000's in posterity.

Recent literature suggests that the size of implicit taxes generated via the banking sector in China is significantly larger than our estimates. According to Lardy (2008),

> *"The People's Bank of China controls interest rates in a way that has led to significant financial repression-low and now negative real return on deposits-as inflation has risen in recent years. This distorted interest rate structure is a significant obstacle to further reform of the financial system and to sustaining China's rapid economic growth. Financial repression costs Chinese households about 255 billion renminbi (US$36 billion), 4.1 percent of China's GDP, and a fifth of it goes to corporations, one-quarter to banks, and the government assumes the rest."*

V. Methodology and Data

The dependent variable is number of net easings of outflows in a quarter by each country. The main regression equation is:

$$Number\ of\ Net\ Easings_{it} = \alpha + \beta X_{i\,t-1} + v_i + u_t + e_{it}$$

Where $X_{i\,t-1}$ are the set of control variables, v_i are the country fixed effects, u_t are the time fixed effects and e_{it} are the errors. All equations were estimated using OLS, with robust standard errors reported. We tested a number of indicators for each of the hypotheses identified in section X above, i.e. the fiscal, overheating concerns, concerns about macroeconomic stability, foreign exchange valuation concerns and financial stability concerns. These variables and their expected signs are listed in Table 3 below. The data appendix Table A.3 lists the data sources and granularity of each variable, and Table A.4 provides their summary statistics.

We ran the regressions sequentially. In the first set of regressions, each variable for each hypothesis was first tested individually in bivariate regressions and then all variables for the given hypothesis are added as a group in multivariate regression for each hypothesis. From these regressions, all variables that were significant at 20% level of significance or less in any of these regressions were used in the joint test of the hypothesis. In the paper, we only report the results of these multivariate regressions. All explanatory variables except the dummy variables are normalized by subtracting the inter-country mean and dividing by the standard deviation, so that the regression coefficients can be interpreted as the impact on net easings of a one standard deviation change in the explanatory variables.

VI. Results

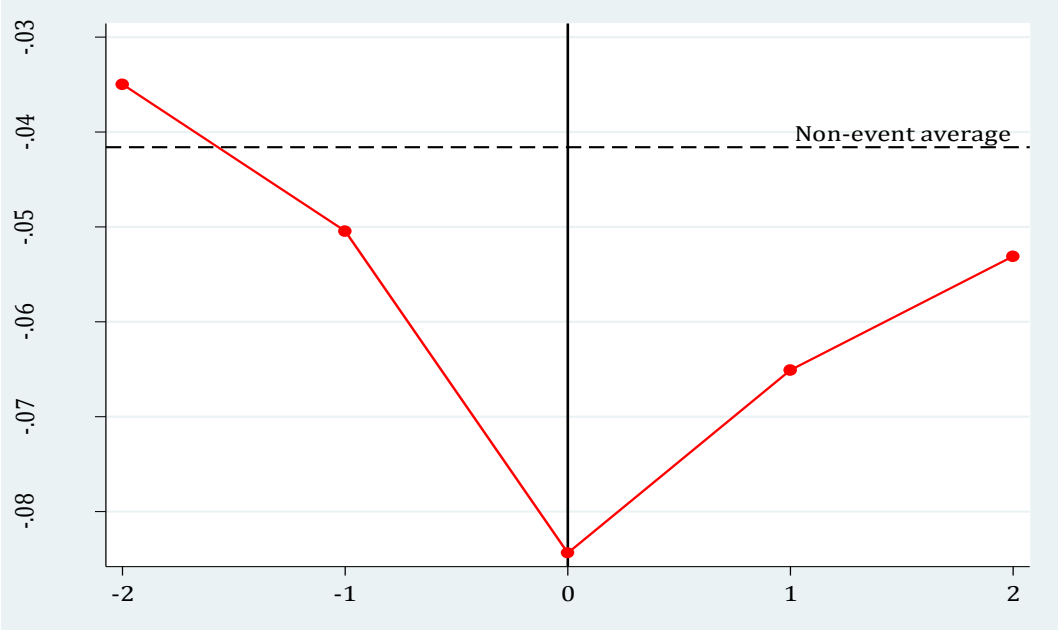
Basic regression results for the full sample are in Table 4, and Table 5 has full sample results but with outliers removed.[14] . Due to concerns about correlation between the explanatory variables, particularly those related through the dimensions of the impossible trinity or the trilemma (size of net capital inflows, capital account openness, exchange rate stability and reserves accumulation), we add each of these variables individually first in columns (1)-(6) and then jointly in columns (7)-(9).

We find that most of the significant variables are associated with concerns related to NKI – sudden stops, volatility, overheating concerns as well as concerns about foreign exchange valuation. The largest coefficients are of NKI stops and NKI volatility, suggesting that countries tightened outflows controls after sudden stops and high volatility in net capital inflows. EMEs also eased outflows controls when inflation pressures became pressing. While the coefficient of inflation appears large, the standard deviation of inflation is high in the sample. The average inflation rate in the sample is 6% year on year, with the standard deviation being 6.6%. In this context, 0.5 more net easings in response to a one standard deviation increase in inflation does not appear to be economically very large.

Countries eased more in response to higher net capital inflows and when these translated into higher appreciation pressure in the exchange market, higher REER volatility and greater accumulation of reserves.[15] While these variables are not significant when added collectively (except exchange market pressure, in the specification without outliers), this may be because of the relationships between them. Figure 9 below illustrates the relationship between changes in outflows controls and exchange rate pressure in an event study setting. The plotted values are the average values of EMP 2 quarters before and after an easing of outflows (for events that represent a net easing of outflows). The figure shows that appreciation pressure was positive and higher than non-event average in the quarters before and including easing periods, and eased a bit in the two quarters immediately after liberalization.

[14] Outliers are defined as observations that lie more than 5 standard deviations from the mean of each variable.
[15] Given the large and volatile repression revenues and REER for Argentina in sample, as well as the impact of debt restructurings (not included in our estimates) on the repression revenues for Argentina, the results on these variables are sensitive to the exclusion of Argentina. Excluding Argentina, the REER volatility is not significant in Tables 4-8 (although the coefficient continues to be positive) and repression revenues are not significant in Table 8. The other results are unchanged, except that some of the crisis variables assume greater significance.

Figure 9: Exchange Market Pressure: Pre-and Post-Easing of Outflows



Note: t=0 is the event date. Event sequences exclude quarters that overlapped with net tightening of outflows events. Non-event averages are averages over quarters that were neither 3 quarters before or after easing events, nor classified as such events.

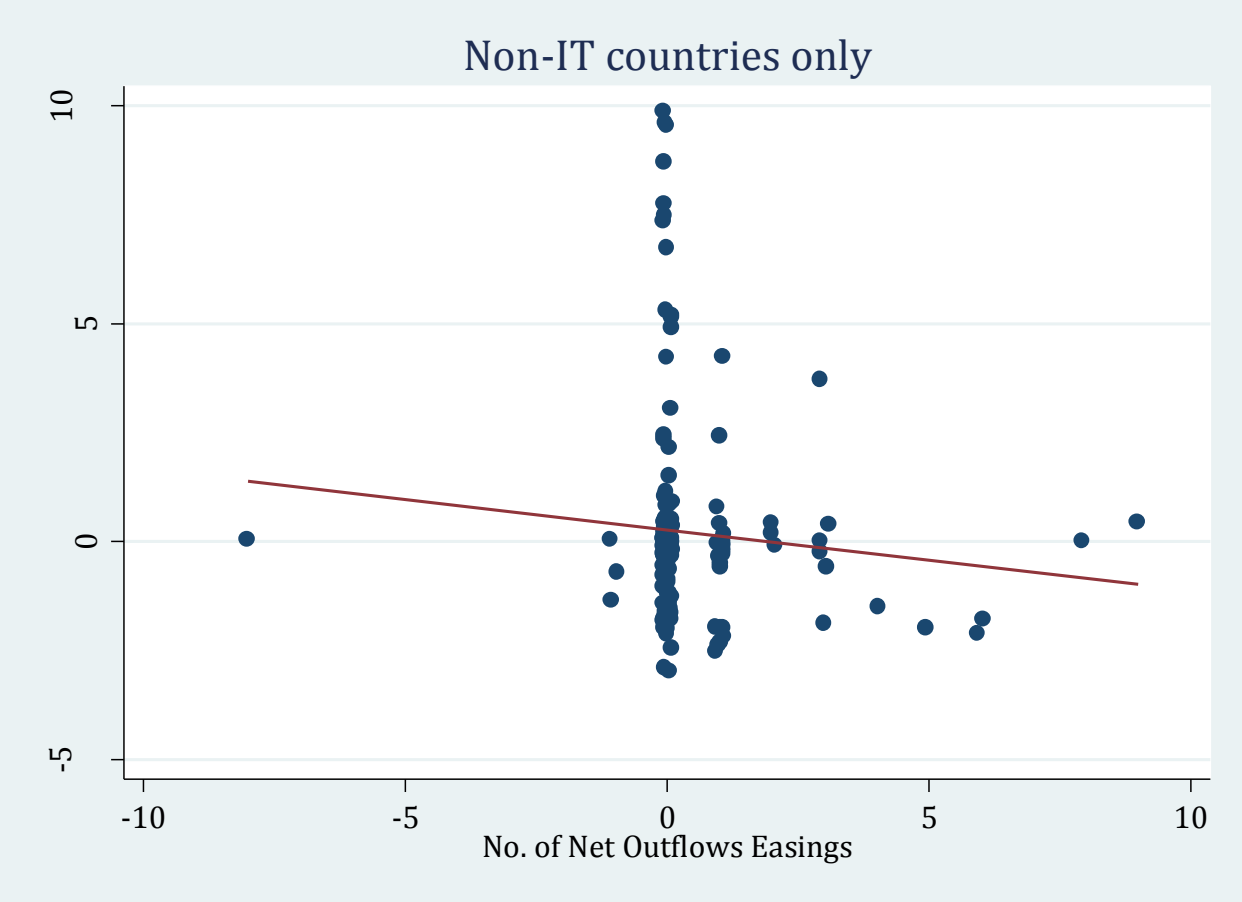
One thing to note in the results is that, the R-squares in the regressions are not very high and we do not explain more than 20% of the variation in the full sample. Several factors could account for this, the foremost among them being the high frequency of 0's in the sample. There are 93 non-zero net easings of outflows in our sample of 442 observations used in the first column of Table 4. Moreover, some countries have relied far less on capital account measures than others in managing capital flows. For example, Colombia, Egypt, Mexico, Turkey, all had fewer than 4 net easings in sample, whereas India, Malaysia, Thailand and South Africa had more than 30. Part of this may be explained by the fact that easings of outflows and tightening of inflows are substitutes in managing capital flows through the use of capital account measures. Brazil, for example, has relied more on tightening of inflows than easing of outflows in managing capital inflows in the last decade.

Another potential factor explaining the low R^2 could be that countries have different preferences for managing capital flows through the use of capital account measures, part of which may be captured by their exchange rate and monetary policy regimes. We therefore divided the sample into countries that had a freely floating exchange rate regime as per IMF AREAER

classification, countries that had an explicit inflation targeting (IT) monetary policy, and those that didn't. As Table 1 showed, non-flexible exchange rate regimes non-IT countries used net outflows easings more frequently than others. Further, as table 6 below shows, they were also less open to capital and trade, had worse fiscal balances and higher repression revenues on average than their counterparts. We therefore ran regressions separately for countries that had a non-flexible exchange rate regime and for countries that had non-IT monetary policy regimes. The results are in tables 7 and 8 respectively.

The results on non-freely floating exchange rate regimes are very similar to the ones in the full sample, albeit with higher R-squares (Table 7). The concerns about size and volatility of net capital inflows and the resulting overheating and appreciation pressures are the most important explanatory variables and fiscal variables are not significant. For the non-IT targeting monetary policy regimes, while the size and volatility of NKI, REER, sudden stops and inflation are still significant, but so are the fiscal variables (Table 8). Economies are less likely to ease when repression revenues are higher and more likely to ease when fiscal balances are higher (Figure 10).

Figure 10: Repression Revenues and Net Easings of Outflows



VII. Conclusions and interpretations

Our results indicate that most of the significant associations of outflows liberalizations in the 2000's were with concerns related to net capital inflows. Countries tightened outflows controls after sudden stops, and high NKI volatility, while they eased when NKI, appreciation pressures, reserves accumulation and inflation were high – all pointing to concerns about foreign exchange valuation and domestic overheating concerns. Financial stability concerns were not particularly important. Unlike the 1980's, we find very limited importance of fiscal variables in explaining liberalization of capital outflows controls - only in the sample of non-inflation targeting countries, do we see a negative association of greater repression revenues with easing of outflows. This lack of association is consistent with the decline in repression revenues for EMEs in the 2000's.

The remarkable decline in the fiscal reliance on financial repression is good news in the context of the deeper tax collection from broader base, and the overall improved stances of policies in EMEs. However, it begs the question of the future of financial repression. History suggests that one should be cautious in extrapolating from recent trends. The 2000s may have been a lucky decade for emerging markets. The growth acceleration of China and India and the illusive great moderation prior to the global crisis of 2008-9 probably contributed to the declining tax revenue from financial repression (by way of the declining risk premia and appreciating real exchange rates of most EMEs before the crisis). Yet, a reversal of these trends frequently changes the attitude towards financial repression (see Reinhart, Kirkegaard and Sbrancia, 2011). History also suggests that EMEs may rely on financial repression as a contingent tax dealing with realized bad tail events (as evidenced by the experience of Argentina in the early 2000s). Finally, we note that our results may overstate the decline in the fiscal role of financial repression, as we overlook the impact of financial repression on the inflation tax and seigniorage. Even though repression revenues have declined to negative on average in 2000's, seigniorage revenues continue to be large and positive.

References

Aizenman, Joshua and Pablo E. Guiddotti (1994) "Capital Controls, Collection Costs and Domestic Public Debt" *Journal of International Money and Finance*, 13, 1: 41-54.

Aizenman, Joshua and Yothin Jinjarak (2009) "Globalisation and Developing Countries – a Shrinking Tax Base?" *The Journal of Development Studies*, 45, 5: 653-671.

Alesina, Alberto, Grilli, Vittorio and Gian Maria Milesi-Ferretti (1994) "The Political Economy of Capital Controls" in Leopnardo Leiderman and Assaf Razin, eds., *Capital Mobility: The Impact on Consumption, Investment and Growth*, Cambrdge University Press.

Bird, Richard and Pierre-Pascal Gendron (2011) *The VAT in Developing and Transitional Countries*, Cambridge University Press.

Broner, Fernando A., Didier, Tatiana, Erce, Aitor and Sergio Schmukler (2011) "Gross Capital Flows: Dynamics and Crises" *Banco de Espana Working Paper* No. 1039. Available at SSRN: http://dx.doi.org/10.2139/ssrn.1825011

Chinn, Menzie D. and Hiro Ito (2008). "A New Measure of Financial Openness" *Journal of Comparative Policy Analysis*, 10, 3: 309 – 322 (September).

Dooley, Michael P. (1996) "A Survey of Academic Literature on Controls over International Capital Transactions" IMF Staff Papers, 43, 4: 639-687.

Edwards, Sebastian (2007) "Capital Controls, Sudden Stops, and Current Account Reversals" in Capital Controls and Capital Flows in Emerging Economies: Policies, Practices and Consequences, University of Chicago Press

Eichengreen, Barry (2001) "Capital Account Liberalization: What do Cross-Country Studies Tell us?" The World Bank Economic Review, 15, 3: 341-365.

Fratzcher, Marcel (2012) "Capital Controls and Foreign Exchange Policy" *European Central Bank Working Paper* No. 1415, February.

Giovannini, Alberto and Martha de Melo (1993) "Government Revenue from Financial Repression" The American Economic Review, 83, 4: 953-963.

Grilli, Vittorrio and Gian Maria Milesi-Ferretti (1995) "Economic Effects and Structural Determinants of Capital Controls" *IMF Staff Papers*, 42, 3: 517-551.

Hutchison, Michael, Pasricha, Gurnain and Nirvikar Singh (2012) "Effectiveness of Capital Controls in India: Evidence from the Offshore NDF Market" *IMF Economic Review*, 60, 3: 395-438.

IMF (2011a) “Recent experiences in managing capital inflows: Cross-cutting themes and possible framework” *IMF Policy Paper*, February.

IMF (2011b) “International Capital flows: Reliable or Fickle?” *World Economic Outlook*, Chapter 4, April 2011.

Kaminsky, Graciela L., Reinhart, Carmen M. amd Carlos A. Végh (2005) “When It Rains, It Pours: Procyclical Capital Flows and Macroeconomic Policies” *NBER Macroeconomics Annual 2004*, Volume 19 (2005), MIT Press.

Klein, Michael W (2012) “Capital controls: Gates and walls”, *Brookings Working Paper*, September.

Lardy, Nicolas R. (2008) “Financial Repression in China” *Paterson Institute for International Economics Policy Brief* , PB08-8, September.

Pasricha, Gurnain Kaur (2012) “Measures to manage capital flows in emerging market economies” *North American Journal of Economics and Finance*, special issue on “International Finance in the aftermath of the 2008 Global Crisis” 23, 3: 286-309.

Patnaik, Ila and Ajay Shah (2012), “Did the Indian capital controls work as a tool of macroeconomic policy?” *IMF Economic Review*, September.

Martin Schindler, 2009. “Measuring Financial Integration: A New Data Set” *IMF Staff Papers*, Palgrave Macmillan, vol. 56(1), pages 222-238, April.

Quinn, Dennis P., 1997, “The Correlates of Change in International Financial Regulation” American Political Science Review, 91, 531–551 (September).

Reinhart, M. Carmen, Jacob F. Kirkegaard, and M. Belen Sbrancia (2011) “Financial Repression Redux” Finance and Development, 48, 1: 22-26.

Reinhart, M. Carmen and Kenneth S. Rogoff (2011) “From Financial Crash to Debt Crisis” American Economic Review, American Economic Association, 101(5), 1676-1706, August.

Warnock, Francis E (2011), “Doubts about capital controls”, report, Council on Foreign Relations, April.

Table 1: Changes by Monetary Policy Framework and Exchange Rate Regime

	No. of Outflows Easings	No. of Outflows Tightenings	No. of Net Outflows Easings	Net Outflows Easings per Country-Quarter
IMF Monetary Policy Framework				
Inflation Targeting (IT)	130	9	121	0.33
Total Non-IT	144	19	125	0.46
IMF X Rate Classifications				
Floating	147	21	126	0.44
Freely Floating	76	6	70	0.28
Other	3	0	3	0.16
Soft Peg	48	1	47	0.30
Total	274	28	246	0.35

Table 2: EMEs growth was higher and less volatile during 2000's compared to 1980's. EMEs were de-facto more open on average in 2000's.

	GDP per capita growth (%)		Chinn-Ito Index of Openness		Trade/GDP (%)	
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
2000s	3.65	3.59	0.10	1.22	67.92	40.2
1980s	2.04	5.01	-0.81	1.34	43.84	24.71

Table 3: Variables by hypothesis (and their expected signs)

I. Fiscal reasons:

1. Fiscal space: Expected sign (+) as more space allows liberalization
   - (i) Fiscal Balance/Tax Revenues: (+);
   - (ii) Government Debt/Tax Revenues: (-)
2. Revenue from Repression: Expected sign (-) as higher revenues from repression curtail incentive to liberalize
3. Liquidation Tax: Negative of real interest rate on domestic government debt. Expected sign (-) as higher tax means lower incentive to liberalize
4. Real deposit rate on bank deposits: Expected sign (+) as lower rate means more repression and therefore lower incentive to liberalize
5. Banking Sector Net Lending to Govt*Inflation: Expected sign (-) as higher values imply greater revenues from repression.

II. Concerns about "overheating":

1. Net capital inflows (NKI): expected sign = (+) as outflows controls are NKI reducing measures
   - (i) NKI over past year/average of past 3 yrs
   - (ii) year-over-year (yoy) change in NKI
   - (iii) NKI/GDP
   - (iv) Volatility: 2-year standard deviation of change in NKI
2. Credit growth: Expected sign(+)
3. Inflation rate: yoy change in CPI. Expected sign (+)
4. GDP growth
5. Currency Account Balance/GDP: Expected sign (+)

III. Concerns about Macro-stability:

1. NKI volatility (+/-) : 3-yr std dev of quarterly NKI
2. GDP growth volatility (+/-): 3-yr standard deviation of GDPgrowth
3. FX volatility (+/-):3-yr standard deviation of monthly(?) REER changes
4. Equity return volatility (+/-):3-yr standard deviation of monthly equity market returns.

IV. Concerns about FX valuation:

1. REER appreciation over the past year (+)
2. FX reserves: (+)
3. FX regime - float (-)
4. IT regime - (-)
5. Exchange Market Pressure (EMP) : (-)
6. Undervaluation (PPP-based) : (-)

V. Concerns about Financial Stability:

1. Composition of gross inflows (non-FDI gross inflows/Gross inflows): (+)
2. Composition of net inflows (non-FDI net inflows/NKI): (+)

Table 3 (contd.): Variables by hypothesis (and their expected signs)

3. Surge (in gross inflows): (+)
4. Sudden stop (in gross inflows): (+)
5. Flight (surge in gross outflows): (-)
6. Increase in stock price index over past year: (+)
7. Stock market capitalization/GDP (+)
8. Inflation Crisis and severe inflation crisis: (-)
9. Domestic default and external default: (-)
10. Banking crisis: (-)
11. Stock market crash: (-)

VI. Other controls:
1. Trade/GDP: (+)
2. Chinn-Ito index of capital account openness: (-)
3. VIX: (+)
4. Interbank interest rate differential from US: (+)

Table 4: Dependent Variable: No. of Net Easings of Outflows

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Fiscal Balance/Tax Revenues	0.10	0.11	0.10	0.04	0.11	0.11*	0.03	0.03	0.04
	(0.07)	(0.06)	(0.06)	(0.13)	(0.07)	(0.06)	(0.13)	(0.13)	(0.12)
Repression Revenues/GDP	0.12	0.13	0.12	0.18	0.14	0.12	0.22	0.23	0.23*
	(0.17)	(0.18)	(0.17)	(0.13)	(0.17)	(0.17)	(0.15)	(0.15)	(0.12)
NKI stop	-0.44	-0.52*	-0.49	-0.47	-0.54*	-0.53*	-0.47	-0.47	-0.52
	(0.27)	(0.28)	(0.29)	(0.27)	(0.28)	(0.28)	(0.30)	(0.30)	(0.30)
Gross Inflows Stop	0.08	0.06	0.11	0.12	0.06	0.07	0.11	0.11	0.14
	(0.26)	(0.26)	(0.26)	(0.27)	(0.25)	(0.26)	(0.27)	(0.29)	(0.29)
Banking Crisis	-0.14	-0.20	-0.19	-0.16	-0.24	-0.18	-0.30	-0.30	-0.25
	(0.11)	(0.13)	(0.12)	(0.11)	(0.17)	(0.11)	(0.24)	(0.24)	(0.25)
Flight	-0.09	-0.11	-0.11	-0.00	-0.10	-0.10	-0.00	-0.01	-0.02
	(0.18)	(0.19)	(0.19)	(0.17)	(0.19)	(0.18)	(0.17)	(0.17)	(0.17)
REER volatility	0.16**	0.14*	0.14*	0.15*	0.15*	0.15**	0.13	0.13	0.11
	(0.07)	(0.08)	(0.07)	(0.07)	(0.07)	(0.07)	(0.09)	(0.08)	(0.07)
Inflation	0.48***	0.47***	0.46***	0.46***	0.45***	0.47***	0.45***	0.44***	0.41**
	(0.15)	(0.15)	(0.14)	(0.14)	(0.14)	(0.15)	(0.13)	(0.14)	(0.15)
IT monetary policy	0.07	0.07	0.07	0.10	0.07	0.07	0.10	0.09	0.13
	(0.15)	(0.16)	(0.16)	(0.15)	(0.17)	(0.15)	(0.16)	(0.18)	(0.17)
NKI Volatility	-0.30**	-0.26*	-0.26*	-0.32**	-0.29*	-0.26*	-0.34**	-0.33**	
	(0.14)	(0.13)	(0.12)	(0.13)	(0.14)	(0.12)	(0.14)	(0.13)	
NKI/GDP	0.10**						-0.01	-0.01	-0.04
	(0.04)						(0.09)	(0.10)	(0.09)
REER Appreciation		0.03					0.06	0.06	0.06
		(0.05)					(0.07)	(0.07)	(0.07)
EMP			-0.09**				-0.05	-0.05	-0.05
			(0.03)				(0.04)	(0.04)	(0.04)
D. Reserves/GDP				0.09*			0.07	0.07	0.08
				(0.04)			(0.07)	(0.07)	(0.07)
Trade/GDP					0.25		0.29	0.31	0.24
					(0.35)		(0.44)	(0.44)	(0.46)
Net Easings of Inflows						-0.04			
						(0.04)			
Capital Account Openness (Chinn-Ito)								-0.07	-0.07
								(0.19)	(0.20)
Gross Inflows volatility									-0.18
									(0.12)
Observations	442	442	442	426	437	442	421	421	421
R-squared	0.17	0.16	0.17	0.17	0.17	0.17	0.18	0.18	0.17
Number of ccode	14	14	14	14	13	14	13	13	13
Time FE	QTR	QTR	QTR	QTR	QTR	QTR	QTR	QTR	QTR
Ctrys	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL

Robust standard errors in parentheses. All explanatory variables are lagged 1 quarter and normalized.
*** p<0.01, ** p<0.05, * p<0.1

Table 5: Dependent Variable: No. of Net Easings of Outflows; Outliers Removed.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Fiscal Balance/Tax Revenues	0.11	0.12	0.11	0.05	0.12	0.12	0.03	0.04	0.05
	(0.07)	(0.07)	(0.07)	(0.13)	(0.07)	(0.07)	(0.13)	(0.13)	(0.13)
Repression Revenues/GDP	0.11	0.12	0.11	0.17	0.13	0.11	0.21	0.22	0.22*
	(0.16)	(0.18)	(0.16)	(0.12)	(0.17)	(0.17)	(0.14)	(0.15)	(0.12)
NKI stop	-0.46	-0.53*	-0.50	-0.49*	-0.56*	-0.54*	-0.52	-0.52	-0.57*
	(0.28)	(0.28)	(0.29)	(0.27)	(0.29)	(0.28)	(0.32)	(0.32)	(0.32)
Gross Inflows Stop	0.05	0.03	0.09	0.10	0.04	0.05	0.11	0.10	0.13
	(0.26)	(0.26)	(0.26)	(0.27)	(0.25)	(0.25)	(0.27)	(0.29)	(0.29)
Banking Crisis	-0.13	-0.20	-0.19	-0.16	-0.24	-0.19	-0.31	-0.31	-0.26
	(0.11)	(0.13)	(0.12)	(0.11)	(0.17)	(0.11)	(0.25)	(0.26)	(0.27)
Flight	-0.09	-0.12	-0.11	-0.01	-0.11	-0.11	-0.01	-0.02	-0.03
	(0.19)	(0.19)	(0.19)	(0.17)	(0.19)	(0.18)	(0.17)	(0.17)	(0.18)
REER volatility	0.17**	0.15	0.15*	0.16**	0.15**	0.15**	0.13	0.14	0.12
	(0.07)	(0.08)	(0.07)	(0.07)	(0.07)	(0.07)	(0.09)	(0.09)	(0.07)
Inflation	0.46***	0.46***	0.44***	0.45***	0.44***	0.46***	0.42***	0.41**	0.38**
	(0.15)	(0.15)	(0.14)	(0.14)	(0.14)	(0.15)	(0.13)	(0.15)	(0.16)
IT monetary policy	0.08	0.07	0.08	0.10	0.07	0.07	0.11	0.08	0.12
	(0.16)	(0.16)	(0.16)	(0.15)	(0.17)	(0.16)	(0.17)	(0.18)	(0.18)
NKI Volatility	-0.29*	-0.26*	-0.25*	-0.30**	-0.29*	-0.25*	-0.32*	-0.31*	
	(0.14)	(0.14)	(0.13)	(0.14)	(0.15)	(0.13)	(0.15)	(0.15)	
NKI/GDP	0.09						-0.04	-0.05	-0.08
	(0.07)						(0.14)	(0.15)	(0.14)
REER Appreciation		0.02					0.05	0.05	0.05
		(0.05)					(0.06)	(0.07)	(0.07)
EMP			-0.11**				-0.10*	-0.10*	-0.10*
			(0.04)				(0.05)	(0.05)	(0.05)
D. Reserves/GDP				0.09*			0.07	0.07	0.08
				(0.05)			(0.07)	(0.08)	(0.08)
Trade/GDP					0.24		0.39	0.43	0.36
					(0.41)		(0.53)	(0.53)	(0.55)
Net Easings of Inflows						-0.04			
						(0.04)			
Capital Account Openness (Chinn-Ito)								-0.15	-0.15
								(0.22)	(0.23)
Gross Inflows volatility									-0.15
									(0.13)
Observations	437	437	437	421	432	437	416	416	416
R-squared	0.17	0.16	0.17	0.17	0.17	0.17	0.18	0.18	0.18
Number of ccode	14	14	14	14	13	14	13	13	13
Time FE	QTR	QTR	QTR	QTR	QTR	QTR	QTR	QTR	QTR
Ctrys	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL

Robust standard errors in parentheses. All explanatory variables are lagged 1 quarter and normalized.

*** p<0.01, ** p<0.05, * p<0.1

Table 6: Countries with IT monetary policy and freely floating exchange rates are different than their counterparts in terms of openness and fiscal outcomes.

	Chinn-Ito Openness Index	Schindler's Capital Outflows Restrictions Index	Trade/GDP	Fiscal Balance/ Tax Revenues	Repression Revenues/ GDP
Non-IT countries	-0.13	0.73	79.67	-19.52	0.18
IT countries	0.3	0.57	63.73	-8.93	-0.48
Non-Freely Floating Exchange Rate Regimes	0.11	0.72	74.95	-15.89	0.06
Freely Floating Exchange Rate Regimes	0.12	0.57	61.34	-8.82	-0.71

Table 7: Non-Freely floating exchange rate regimes only, Outliers Removed; Dependent variable: Net Easings of outflows

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Fiscal Balance/Tax Revenues	-0.00	0.02	0.01	-0.08	0.00	0.02	-0.14	-0.13	-0.12
	(0.12)	(0.13)	(0.12)	(0.21)	(0.12)	(0.14)	(0.20)	(0.21)	(0.20)
Repression Revenues/GDP	-0.28	-0.31	-0.31	-0.11	-0.25	-0.30	-0.07	-0.06	0.05
	(0.32)	(0.33)	(0.33)	(0.32)	(0.34)	(0.32)	(0.35)	(0.35)	(0.30)
NKI stop	-0.56	-0.64	-0.66	-0.67	-0.72	-0.63	-0.80	-0.80	-0.83
	(0.51)	(0.51)	(0.53)	(0.51)	(0.52)	(0.53)	(0.59)	(0.59)	(0.61)
Gross Inflows Stop	0.13	0.10	0.16	0.21	0.12	0.08	0.28	0.28	0.28
	(0.49)	(0.49)	(0.51)	(0.49)	(0.47)	(0.51)	(0.48)	(0.48)	(0.51)
Banking Crisis	-0.02	-0.15	-0.16	-0.07	-0.35	-0.16	-0.33	-0.34	-0.30
	(0.35)	(0.29)	(0.33)	(0.32)	(0.33)	(0.33)	(0.29)	(0.32)	(0.35)
Flight	0.25	0.17	0.20	0.39	0.18	0.19	0.35	0.35	0.31
	(0.34)	(0.34)	(0.33)	(0.33)	(0.33)	(0.32)	(0.26)	(0.26)	(0.27)
REER volatility	0.39**	0.39**	0.38**	0.34**	0.37**	0.38**	0.33*	0.34*	0.33*
	(0.13)	(0.14)	(0.14)	(0.14)	(0.14)	(0.13)	(0.16)	(0.17)	(0.17)
Inflation	0.61***	0.61** *	0.59**	0.54** *	0.57**	0.61** *	0.48**	0.48**	0.47**
	(0.20)	(0.18)	(0.20)	(0.16)	(0.19)	(0.19)	(0.16)	(0.16)	(0.16)
NKI Volatility	-0.72**	-0.71**	-0.69**	-0.61*	-0.76**	-0.69**	-0.69*	-0.69*	
	(0.29)	(0.28)	(0.29)	(0.31)	(0.31)	(0.27)	(0.36)	(0.36)	
NKI/GDP	0.17**						0.06	0.06	0.04
	(0.08)						(0.32)	(0.33)	(0.33)
REER Appreciation		-0.02					-0.00	0.00	-0.02
		(0.06)					(0.10)	(0.11)	(0.11)
EMP			-0.09				-0.11*	-0.11*	-0.11*
			(0.07)				(0.06)	(0.06)	(0.06)
D. Reserves/GDP				0.11			-0.01	-0.01	-0.01
				(0.08)			(0.17)	(0.17)	(0.18)
Trade/GDP					0.88*		1.16*	1.15*	0.81
					(0.42)		(0.60)	(0.59)	(0.61)
Net Easings of Inflows						-0.04			
						(0.03)			
Capital Account Openness (Chinn-Ito)								-0.06	-0.15
								(0.35)	(0.37)
Gross Inflows volatility									-0.69
									(0.40)
Observations	258	258	258	242	253	258	237	237	237
R-squared	0.27	0.27	0.27	0.28	0.28	0.27	0.29	0.29	0.29
Number of Countries	13	13	13	13	12	13	12	12	12
Time FE	QTR	QTR	QTR	QTR	QTR	QTR	QTR	QTR	QTR

Robust standard errors in parentheses, Outliers removed.
*** p<0.01, ** p<0.05, * p<0.1

Table 8: Non-IT monetary policy countries only. Outliers Removed.
Dependent Variable: No. of Net Easings of Outflows;

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Fiscal Balance/Tax Revenues	0.08	0.09	0.11*	-0.08	0.07	0.10**	0.00	-0.01	-0.02
	(0.06)	(0.05)	(0.05)	(0.19)	(0.07)	(0.04)	(0.22)	(0.22)	(0.23)
Repression Revenues/GDP	-0.48**	-0.48**	-0.48*	-0.34	-0.43*	-0.44**	-0.37	-0.40	-0.34
	(0.18)	(0.19)	(0.20)	(0.20)	(0.20)	(0.15)	(0.27)	(0.26)	(0.22)
NKI stop	-1.59**	-1.60***	-1.51**	-1.59**	-1.65**	-1.63***	-1.77	-2.01*	-1.99*
	(0.45)	(0.41)	(0.49)	(0.52)	(0.51)	(0.41)	(0.98)	(0.94)	(0.92)
Gross Inflows Stop	1.59**	1.59**	1.41*	1.82**	1.48*	1.59**	1.56	1.76	1.75
	(0.54)	(0.50)	(0.59)	(0.50)	(0.58)	(0.58)	(1.28)	(0.96)	(1.02)
Banking Crisis	-0.24	-0.11	-0.24	0.11	-0.32	-0.20	-0.17	-0.28	-0.27
	(0.65)	(0.57)	(0.64)	(0.39)	(0.62)	(0.64)	(0.63)	(0.58)	(0.57)
Flight	0.07	0.11	0.09	0.13	0.14	0.11	0.07	0.04	-0.03
	(0.25)	(0.20)	(0.24)	(0.29)	(0.20)	(0.26)	(0.11)	(0.14)	(0.26)
REER volatility	0.41**	0.40**	0.41**	0.38**	0.41**	0.39**	0.33	0.38	0.42
	(0.13)	(0.12)	(0.14)	(0.13)	(0.13)	(0.12)	(0.30)	(0.33)	(0.40)
Inflation	0.76**	0.73***	0.80***	0.49**	0.73**	0.78**	0.41	0.45	0.47
	(0.21)	(0.19)	(0.21)	(0.20)	(0.24)	(0.23)	(0.23)	(0.25)	(0.27)
NKI Volatility	-0.72**	-0.69**	-0.76**	-0.50	-0.83**	-0.68**	-0.43	-0.40	
	(0.28)	(0.25)	(0.28)	(0.38)	(0.29)	(0.25)	(0.76)	(0.71)	
NKI/GDP	-0.01						-0.40	-0.44	-0.44
	(0.10)						(0.96)	(0.88)	(0.89)
REER Appreciation		-0.07					0.06	0.08	0.08
		(0.05)					(0.11)	(0.11)	(0.11)
EMP			0.08				0.07	0.05	0.05
			(0.08)				(0.14)	(0.13)	(0.13)
D. Reserves/GDP				0.15			0.25	0.25	0.24
				(0.08)			(0.33)	(0.33)	(0.34)
Trade/GDP					0.72***		0.82	0.76	0.48
					(0.15)		(1.08)	(0.91)	(0.74)
Net Easings of Inflows						-0.07			
						(0.06)			
Capital Account Openness (Chinn-Ito)								-0.51	-0.62
								(0.72)	(0.82)
Gross Inflows volatility									-0.55
									(0.95)
Observations	139	139	139	123	134	139	118	118	118
R-squared	0.48	0.48	0.48	0.50	0.49	0.48	0.51	0.51	0.52
Number of ccode	7	7	7	7	6	7	6	6	6
Time FE	QTR	QTR	QTR	QTR	QTR	QTR	QTR	QTR	QTR

Robust standard errors in parentheses, Outliers removed.
*** p<0.01, ** p<0.05, * p<0.2

Appendix

A. Measures on the capital account and their classification

The database on capital controls measures is an extended version of the data collected in Pasricha (2012).It includes information on the "capital transactions" category of the IMF AREAER, supplemented by information on similar measures from central banks' and other country regulators' websites, news sources and other research papers. The IMF AREAER breaks down the broad category, capital transactions, as follows:

1. Controls on capital and money market instruments:
    a. Controls on capital market securities: further classified into "controls on shares or other securities of a participating nature" and "banks or other debt securities"
    b. Controls on money market instruments
    c. Controls on collective investment schemes
2. Controls on derivatives and other instruments
3. Controls on Credit Operations:
    a. Commercial Credits
    b. Financial Credits
    c. Guarantees, sureties and financial backup facilities
4. Controls on direct investment
5. Controls on liquidation of direct investment
6. Controls on real estate transactions
7. Controls on personal capital transactions
8. Provisions specific to the financial sector:
    a. Provisions specific to commercial banks and other credit institutions, which includes open foreign exchange position limits and other provisions
    b. Provisions specific to institutional investors

If a major policy announcement takes place and includes measures related to several categories above, each measure is classified in each category in which it belongs and is counted separately. We classify the measures into the following categories:

1. Whether the measure (or change) impacts capital inflows (I) or outflows (O) or cannot be clearly identified as affecting only one of these categories (other).[16] For the purpose of this paper, the 'other' measures are classified as both outflows and inflows controls.
2. Whether the change represents an easing (E) or tightening (T) of policy or a neutral/ institutional change.

In order to understand the direction of policy better, we group the measures into whether the measures would encourage or discourage Net Capital Inflows (NKI), i.e. the difference between inflows and outflows. This gives us the following categories:

[16] Examples of the other measures that could not be classified as inflow or outflow measures include limits on net open foreign exchange positions of financial institutions, ban on use of foreign currency in special economic zones, restrictions on transactions that would constitute at once an inflow and outflow, for example use of external borrowing to invest abroad, etc.

3. NKI Reducing Measures: These are measures that represent tightening of inflows, easing of outflows or other tightening.
4. NKI Increasing Measures: These are measures that represent easing of inflows, tightening of outflows or other easing.
5. Net NKI Restricting Measures = NKI Reducing Measures - NKI Increasing Measures

B. Computation of Repression Revenues

Table A.1: Repression Revenues computations and formulas

#	Variable	Descriptions and Source	Frequency
1	Total interest on external PPG debt from private creditors	Interest payments on external PPG debt from private creditors + increase in interest arrears to private creditors, in USD amounts. Note: For India, the external interest payments in 2003 and 2005 jumped as they included the interest accrued over 5 years but paid at maturity, for Resurgent India Bonds and Millenium India Deposits. The interest payments for RIB amounted to USD 1 billion in 2003 and for MID to USD 1.6 billion in 2005 (Source: RBI report on India's external debt, various issues). These amounts were deleted from 2003 and 2005 interest payments and re-allocated proportionately over the 5-year term of each of these borrowings. Source: World Bank WDI	Annual
2	External PPG debt outstanding and disbursed, from private creditors	In USD. Source: World Bank WDI	Annual
3	Interest Rate on External Debt	#1 divided by (#2(t)+#2(t-1))/2, expressed as % per annum.	Annual
4	Exchange Rate	Local Currency Units (LCU) per USD, period average	Annual
5	Depreciation of Exchange Rate	(#4(t)-#4(t-1))*100/#4(t-1)	Annual
6	Effective Interest Rate on External Debt	#3(1+#5*.01)	Annual
7	Net Flow of PPG debt from Private Creditors, in USD	Source: World Bank WDI	Annual
8	Debt Revaluation Costs	This variable captures the impact of change in value of debt denominated in non-domestic and non-USD currencies, due to the revaluation of domestic currency against USD and the revaluation of USD against these currencies. It is computed as : (#2(t)-#2(t-1) - #7)*100/#2(t-1) + #5(1-#3*0.01)	Annual
9	Effective Interest Rate on External Debt, including Debt Revaluation Costs	#3(1+#5*.01)+#8	Annual

#	Variable	Descriptions and Source	Frequency
10	Domestic interest payments	in LCU. Country sources, see country sources in Table A.2	Annual/ Quarterly
11	Total domestic debt outstanding	in LCU. Country sources, see country sources in Table A.2	Annual/ Quarterly
12	Domestic Interest Rate	#10/(#11(t)+#11(t-1)/2), expressed as % pa	Annual/ Quarterly
13	Repression Revenue	(Effective External interest rate -domestic interest rate)*domestic debt outstanding. i.e. (#6-#12)*11	Annual/ Quarterly
14	Repression Revenue (including debt revaluation costs)	(#9-#12)*#11	Annual/ Quarterly
	Components of Repression Revenues:		
15a	a. Interest Differential, % pa	External Interest Rate (in USD terms) -Domestic Interest rate, i.e. #3-#12	Annual/ Quarterly
15b	b. FX Rate Component, % pa	External Interest Rate*Depreciation of exchange rate, i.e. #3*#5*.01	Annual/ Quarterly

Table A.2: Country Sources for Domestic Interest and Domestic Debt

Notes:

Domestic interest at time t (i_t) is computed as (Series #1) interest paid on domestic debt of government $_t$/(0.5*(Series #2)Gross domestic debt outstanding$_t$+ 0.5*(Series #2)Gross domestic debt outstanding $_{t-1}$)

Variables, except interest rates, are in local currency units (LCU) unless otherwise specified.

For quarterly data, the domestic interest is annualized by multiplying the above by 4.

In some cases, where the data starts in 2001 or later, the first observation uses gross domestic debt outstanding at t, instead of the average of t and t-1, to avoid losing the observation.

For Argentina, Peru and Turkey, quarterly, non-seasonally adjusted data on interest payments was available, and displayed seasonality. The interest rate computed was smoothed by taking the 4-quarter moving average of i_t (including time t).

	Series Name	Sources/Definitions	Original Frequency
	Argentina		
1	Current Outlays: Interest on Domestic Public Debt	Haver	Quarterly
2.a	Gross Public Debt (USD)	Haver	Quarterly
2.b	End of period exchange rate against USD	IMF International Financial Statistics (IFS)	Quarterly
2.c	Non-financial Public Sector and Central Bank External Debt (USD)	Haver	
2	Domestic Public Debt Outstanding	(#2a-#2c)*#2.b	Quarterly
	Brazil		

	Series	Sources/Definitions	Original Frequency
	Net public sector implicit interest rate on internal debt	Banco Central do Brasil. Quarterly data are averages of monthly data available from source. Due to data availability, 2001-October 202 include Perobras and Electrobras, and the subsequyent numbers exclude these state owned enterprises.	Monthly
	Gross Public Sector Domestic Debt	Banco Central do Brasil.	Monthly
	Chile		
1.a	Central government expenditure: interest on debt	Haver; IFS	Annual
1.b	General government (excluding Central Bank) expenditure: interest on long term external debt (USD)	Banco Central de Chile	Annual
1.c	Exchange rate against USD (Period Average)	IMF IFS	Annual
1	Central Government Domestic Interest Rate	(#1.a - #1.b)*#1.c	Annual
2	Central Government Gross Financial Debt	Haver	Annual
	Colombia		
	Average coupon on central government domestic debt	Haver	Quarterly
2	Central government (medium and long term) domestic debt	Haver	Quarterly
	China		
	National Government expenditure: Treasury Securities Domestic Interest	Haver/ Ministry of Finance	Annual
	Central Government Gross Debt	Haver/ CNBS	Annual
	Czech Republic		
1	State Debt -domestic Debt	Ministry of Finance	Annual
2	State Debt - Interest Costs	Ministry of Finance	Annual
	Egypt		
1	Consolidated General Government Expenditure	Haver/Ministry of Finance	Annual
2	General Government Gross Domestic Debt	Haver/Ministry of Finance; Available every June from 2001-March 2006. Linearly interpolated for Q4 values.	Annual
	India		
1.a	Central Government Total Interest Payments	Ministry of Finance	Annual
1.b	Central Government External Interest Payments	Ministry of Finance	Annual
1	Central Government Domestic Interest Payments	#1.a-#1.b	
2	Central Government Total Internal Liabilities	Reserve Bank of India	Annual

		Note: all variables available for fiscal year. Fiscal year values converted to calendar year by taking 1/4 of previous fiscal year and 3/4 of current fiscal year.	
	Indonesia		
1	Central Government Current Expenditure: Interest Payments	Haver/DK	Annual
2	Central Government Domestic Debt	Haver/Bank of Indonesia	Monthly
	Malaysia		
	Federal Government Operating Expenditure: Debt Service charges, domestic	Banka Negara Malaysia	Annual
2	Federal Government Total Domestic Debt	Banka Negara Malaysia	Annual
	Mexico		
1	Public Sector domestic interest payments	Secretaria de Hacienda Credito Publico	
2	Public Sector domestic debt	Secretaria de Hacienda Credito Publico	
	Peru		
1	Central Government Interest on Domestic Debt	Haver/BCRP	Quarterly
2.a	Federal Government Domestic Gross Debt (NSA) (USD)	Haver/BCRP	Quarterly
2.b	Exchange rate against USD (End of Period)	IFS	Quarterly
2	Federal government Gross Domestic Debt	#2.a*#2.b	Quarterly
	Philippines		
1	National government Current Operating Expenditure: Interest Payments - domestic	Datastream	Quarterly
2	Central Government Domestic Debt	Oxford Economics	Annual
	South Africa		
1	National government Interest on Domestic Debt	South Africa Treasury	Annual
2	National Government Gross Domestic Debt	Haver/ SARB	Quarterly
	Turkey		
1	Central Government Budget Expenses: Domestic Interest	Central Bank of Turkey	Monthly
2	Domestic Debt Position (Treasury)	Central Bank of Turkey	Monthly

C. Data Appendix

Table A3. Countries in Sample

Argentina	Egypt	Mexico	South Africa
Brazil	India	Morocco	Taiwan
Chile	Indonesia	Peru	Thailand
China	Korea	Philippines	Turkey
Colombia	Malaysia	Russia	

Table A.4: Summary Statistics of Explanatory Variables

	N	Minimum	Maximum	Median	Mean	Standard Deviation
Fiscal concerns						
Fiscal Balance (% of Tax Revenues)	656	-138.33	94.98	-10.86	-13.36	31.54
Govt. Debt (% of Tax Revenues)	656	69.25	2817.58	879.11	980.76	610.38
Fiscal Balance (% of GDP)	628	-16.75	12.22	-1	-0.81	4.11
External - Domestic Interest Rate on Govt. Debt	504	-14.8	8.72	-0.9	-1.07	3.74
Liquidation Tax	528	-12.31	25.52	-2.68	-1.97	4.36
Repression Revenues/GDP (%)	501	-8.28	9.89	-0.18	-0.23	1.9
Repression Revenues (including USD Revaluation costs), as % of GDP	501	-39.79	12.04	-0.21	-0.94	5.81
Real interest rate on deposits	712	-15.75	38.14	1.04	1.16	4.43
(Banking Sector Net Lending to Govt./Total Banking Sector Assets) * Inflation	712	-13.85	52.33	0.96	2.01	4.74
Overheating Concerns						
Domestic Credit/GDP Growth (yoy, %)	684	-32.14	31.24	-0.43	0.07	6.24
Inflation	712	-2.79	70.33	4.4	6.06	6.62
Real GDP growth (% yoy)	700	-14.74	16.09	5.3	5.07	3.81
Current Account Balance/GDP	601	-7.23	19.47	0.54	1.52	4.59
Change in NKI (% yoy)	712	-165.77	142.35	0.43	0.85	11.59
NKI/GDP (%)	680	-26.12	12.62	1.5	1.05	3.97
FX Valuation Concerns						
Change in Reserves/GDP (yoy)	684	-9.43	14.24	0.27	0.64	2.77
Exchange Market Pressure	712	-0.73	0.93	-0.05	-0.05	0.15
Reserves/GDP	670	0.15	53.97	15.84	18.15	11.46
Change in REER (%yoy)	672	-31.35	37.33	0.89	1.41	9.36
REER deviation from trend (%)	672	-46.15	34.56	0.33	0.72	12.57
PPP based undervaluation, %	752	-0.52	0.86	0.16	0.18	0.27
Macroeconomic Stability						
Volatility of real GDP growth	702	0.01	10.64	1.94	2.54	1.91
Volatility of REER change	672	1.76	40.49	6.23	7.82	5.86
Volatility of Equity Returns	752	0.62	93.18	11.16	15.61	13.7
Volatility of NKI change	744	0	159.56	5.64	11.02	17.88

Table 2 (contd.): Summary Statistics of variables

	N	Minimum	Maximum	Median	Mean	Standard Deviation
Volatility of Gross Inflows changes	712	0.44	127.08	6.98	13.03	18.4
Volatility of Gross Outflows changes	706	0.02	109.74	4.73	8.47	12.47
Financial Stability						
Change in Stock Prices (% yoy)	752	-84.84	388.22	16.52	20.59	44.44
Hot Money Net Inflows/NKI (%)	712	-2778.54	12242.88	73.14	83.91	672.38
Hot Money Gross Inflows/Gross Inflows (%)	712	-6.95E+05	6379.68	57.1	-1088	26270.1
Gross Inflows/GDP	680	-19.2	16.73	4.1	4.07	4.2
Gross Outflows/GDP	669	-3.06	17.94	2.26	3.24	3.53
Others						
Trade/GDP	674	19.94	348.34	56.78	72.64	45.58
Chinn-Ito Index of Capital Account Openness	712	-1.86	2.46	-0.11	0.11	1.22
Money Market Interest Rate Differential	610	-3.92	169.13	3.21	5.36	10
VIX	752	10.08	53.68	20.63	21.79	9.36

Table A.5: Data Sources for Explanatory Variables.

Variable	Definition/Source
Fiscal concerns:	
Fiscal Balance (% of GDP)	(Government fiscal balance/GDP)*100. Government fiscal balance is from IMF World Economic Outlook or Oxford Economics. Nominal GDP is from Haver.
Fiscal Balance (% of Tax Revenues)	Fiscal Balance (% of GDP)/(Tax Revenues (% of GDP)). Tax Revenues (% of GDP) are from World Bank WDI.
Govt. Debt (% of Tax Revenues)	(Government gross debt/GDP)*100/(Tax Revenues (% of GDP)). Government gross debt is from Oxford Economics, Tax Revenues (% of GDP) are from WDI and nominal GDP is from Haver.
External - Domestic Interest Rate on Govt. Debt	See appendix Tables A.1 and A.2
Liquidation Tax	Negative of the real interest rate on government domestic debt. See Appendix Tables A.1 and A.2 for details on computation of nominal interest rate on government domestic debt. Real interest rate is computed from nominal rates by subtracting (yoy) CPI inflation.
Repression Revenues/GDP (%)	See appendix Tables A.1 and A.2
Repression Revenues (including USD Revaluation costs), as % of GDP	See appendix Tables A.1 and A.3, and explanations in the text.
Real interest rate on deposits	nominal interest rate on bank deposits, less Inflation. The interest rate data is from IFS. See "Inflation" entry below.
(Banking Sector Net Lending to Govt./Total Banking Sector Assets) * Inflation	(DomClaimsBanks-ClaimsonPvtSecBanks)*100/DomClaimsBanks. DomClaimsBanks is Domestic Claims of Banking Sector, IFS series 32 or FDSAD. ClaimsonPvtSecBanks is Banking Sector's claims on private sector, IFS series 32D.
Overheating Concerns:	
Domestic Credit/GDP Growth (yoy, %)	year-on-year growth of Domestic Credit/GDP. Domestic Credit is Domestic Claims of Banking Sector, IFS series 32 or FDSAD. GDP is nominal GDP from Haver.
Inflation	year on year percentage change in CPI. Data is from IFS.
Real GDP growth (% yoy)	year-on-year growth of real GDP. Real GDP is from Haver.
Current Account Balance/GDP	4-quarter moving average of current account/4-quarter moving average of nominal GDP, in percentage terms. Current account data is from IFS and nominal GDP from Haver.
NKI/GDP (%)	Net capital inflows are the financial account balance, n.i.e. (BPM6) series from IFS and are measured in USD. Nominal GDP data is from Haver and in LCU. It is converted into USD by using the period average exchange rate against USD from IFS. since NKI and GDP data are non-seasonally adjusted, 4-quarter moving average of NKI is divided by the 4-quarter moving average of GDP (and expressed as percentage) to get NKI/GDP.
Change in NKI (% yoy)	$(NKI_t-NKI_{t-4})*100/NKI_{t-4}$

Table A.5 (contd.): Data Sources for Explanatory Variables.

Variable	Definition/Source
FX Valuation Concerns:	
Reserves/GDP (%)	Total reserves excluding gold/annualized nominal GDP. Reserves excluding gold are in SDR, nominal GDP is in local currency units, and is converted into SDR by using end of period exchange rates. All series are from IFS.
D.Reserves/GDP (or Change in Reserves/GDP (yoy))	year-on year change in the above.
Exchange Market Pressure (EMP)	Higher values indicate depreciation pressure. Computed as the sum of two components: (i) quarter on quarter change in log of average exchange rate against SDR (LCU per SDR) (ii) Negative of the change in Reserves less gold (in SDR)/Reserve Money (or Monetary Base). All series are from IFS.
REER Appreciation (% yoy)	Percentage year-on-year change in REER. Positive values indicate REER appreciation. REER data is from IFS
REER deviation from trend (%)	(REER- 5-year moving average of REER)*100/5-year moving average of REER.
PPP based undervaluation, %	
Macroeconomic Stability:	
Volatility of real GDP growth	3-year rolling standard deviation of year-on-year growth of real GDP. The real GDP data is from Haver.
REER volatility	3-year rolling standard deviation of year-on-year change in Real Effective Exchange Rate (REER). The REER data is quarterly and sourced from IFS.
Volatility of Equity Returns	3-year rolling standard deviation of total returns of broad stock market equity index. Return indices are from Datastrem.
NKI Volatility	3-year rolling standard deviation of year-on-year change in 4-quarter sums of NKI. The NKI data is from IFS.
Gross Inflows volatility	3-year rolling standard deviation of year-on-year change in 4-quarter sums of gross inflows (i.e. net inflows by non-residents). The gross inflows data is from IFS (See Gross Inflows/GDP).
Gross Outflows volatility	3-year rolling standard deviation of year-on-year change in 4-quarter sums of gross outflows (i.e. net outflows by residents). The gross outflows data is from IFS (See Gross Outflows/GDP).
Financial Stability:	
Gross Inflows/GDP	Gross inflows are defined as the sum of non-residents' investment in domestic economy either as FDI, portfolio investments, Other lending or derivatives investment. (derivatives investments are only available as a net variables. It is added in gross inflows whenever the variable is negative (under BPM6)). Gross inflows data are from IFS.

Table A.5 (contd.): Data Sources for Explanatory Variables.

Variable	Definition/Source
Gross Outflows/GDP	Gross outflows are defined as the sum of residents' investments abroad either as FDI, portfolio investments, Other lending or derivatives investment. (derivatives investments are only available as a net variable. It is added in gross outflows whenever the variable is positive (under BPM6)). Gross outflows data are from IFS.
NKI stop	Sudden stop in Net Capital Inflows (NKI). Defined according to methodology described in Forbes and Warnock (2012). 4-quarter moving sum of quarterly NKI are first computed and year-on-year changes in these 4-quarter sums are obtained. Sudden stop episodes using three criteria: (1) current year-over-year changes in four-quarter NKI is more than two standard deviations below the historic average during at least one quarter of the episode; (2) the episode is defined as lasting for all consecutive quarters for which the year-over-year change in four-quarter NKI is more than one standard deviation below the historical average; and (3) the length of the episode is greater than one quarter. NKI data are from IFS.
Gross Inflows Stop	Defined analogously to NKI stops, but using gross inflows. Gross inflows are defined as the sum of non-residents' investment in domestic economy either as FDI, portfolio investments, Other lending or derivatives investment. (derivatives investments are only available as a net variables. It is added in gross inflows whenever the variable is negative (under BPM6)). Gross inflows data are from IFS.
Banking Crisis	Reinhart and Rogoff (2011)
Domestic Default	Default or rescheduling on domestic debt (includes deposit freezes). Reinhart and Rogoff (2011)
External Default	Default or rescheduling on foreign debt. Reinhart and Rogoff (2011)
Inflation Crisis	Annual inflation above 20 percent. Reinhart and Rogoff (2011)
Severe Inflation Crisis	Annual inflation above 40 percent. Reinhart and Rogoff (2011)
Flight	A surge in residents' outflows abroad. Defined using gross outflows data from IFS, using methodology described in Forbes and Warnock (2012)
Change in Stock Prices (% yoy)	year on year percentage change in series "LOCNSH: Share prices,Index, 2005=100" from IFS.
Hot Money Net Inflows/NKI (%)	(NKI-net FDI inflows)*100/NKI. Net FDI inflows are series BFD from IFS. NKI is defined above.
Hot Money Gross Inflows/Gross Inflows (%)	Hot Money gross inflows are (Gross Inflows-FDI Inflows)*100/Gross Inflows. FDI Inflows are the series BFDL from IFS. Gross inflows are as defined above.
Other Variables:	
Capital Account Openness (Chinn-Ito)	Higher values indicate greater de-jure capital account openness. Source: Chinn and Ito (2010)

Table A.5 (contd.): Data Sources for Explanatory Variables.

Variable	Definition/Source
Floating Exchange Rate Regime	Dummy variable which takes the value 1 when the country had "Freely Floating" exchange rate policy for more than half the quarter. The exchange rate classification information and dates of change are from IMF AREAER.
IT monetary policy	Dummy variable which takes the value 1 when the country had Inflation Targeting monetary policy framework in more than half the quarter. The IT frameworks information and dates of change are from IMF AREAER.
Money Market Interest Rate Differential (%)	Difference between domestic money market interest rate and that in US. Money market interest rate is series FIMM from IFS.
Net Easings of Inflows	Number of net easings of inflows controls in the quarter by the country. See Appendix A for details on data.
Trade/GDP	(imports + exports) /nominal GDP, expressed as percentage. All series are from Haver/National statistical databases.
VIX	CBOE Volatility index. Source: Datastream.