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WHY DO EMERGING MARKETS LIBERALIZE CAPITAL OUTFLOW CONTROLS?
FISCAL VERSUS NET CAPITAL FLOW CONCERNS

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Why do emerging markets liberalize capital outflow controls? Fiscal versus net capital flow concerns

Joshua Aizenman and Gurnain Kaur Pasricha

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ABSTRACT

Most of the recent policy debate on the appropriateness of capital controls has focused on the use of capital inflow controls in the face of surges in net capital inflows. However, countries that have existing capital outflow controls have another potential tool to reduce net capital inflows (NKI) - the liberalization of outflows. It follows that the decision to liberalize outflow controls in response to surging inflows could potentially involve weighing the benefits of reducing NKI by facilitating greater outflows against the lost revenues from financial repression. In this paper, we weigh the evidence on the complex motivations for capital outflow controls policy by examining the various macroeconomic and fiscal factors at the time these controls were liberalized. Our results indicate that concerns related to net capital inflows took predominance over fiscal concerns in the decision to liberalize capital outflow controls in the 2000's. Emerging market economies (EMEs) facing sudden stops, high volatility in net capital inflows and higher balance sheet exposures liberalized less. Countries eased more in response to higher net capital inflows, and when these inflows 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 outflow controls. This lack of association is consistent with the decline in repression revenues and growth accelerations for EMEs in the 2000's.

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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 have not been found to be particularly effective in empirical literature. Open capital accounts, the argument goes, allow efficient global allocation of resources and risk while increasing 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. They are 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. The empirical literature that analyzes which macroeconomic and financial pressures have most often induced these emerging markets to impose controls is scant.³ Further, most of the recent policy debate has focused on tightening of capital inflow controls in response to surges in inflows and the empirical literature has focused on evaluating the effectiveness of such inflow controls.⁴ However, countries that have existing capital outflow controls have another potential tool to reduce net capital inflows (NKI) - the liberalization of outflows.⁵ This tool was discussed in the literature on managing capital flows of the 1990's (see Laban and Larrain, 1997), 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 outflow controls were the largest share of net capital inflow reducing measures in 22 EMEs in the pre-2008 crisis period (i.e. between 2004 and the onset of the 2008 financial crisis). The pre-2008 crisis period saw a surge in net capital

² South Korea's "President Lee Myung-Bak, in an interview with the Financial Times published on Oct. 29, said any measures that a 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 Fratzscher (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).

⁵ NKI are measured as the difference between inflows by non-residents and net outflows by residents. Therefore both lower net inflows by non-residents and higher net outflows by residents would lead to a decline in NKI.

inflows to EMEs of a magnitude comparable to the post-2008 crisis surge, yet inflow tightening measures became primary tool of restricting net capital inflows (NKI) only after the 2008 crisis.

The use of capital outflow liberalization in capital flow management policy can be constrained by the fact that outflow controls exist not only for reasons of managing capital flows but also to reduce fiscal pressures. Sustained capital outflow controls often form a part of a web of regulations constituting “financial repression”. These regulations 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 EMEs during 1970-80’s, 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 controls found fiscal reasons to be important (Dooley, 1996; Eichengreen, 2001). It follows that the decision to liberalize outflow 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 outflow controls, and the relative impact on domestic actors, as well as the (permanently) lost revenues from financial repression.

In this paper, we make two main contributions to the literature. First, we weigh the evidence on the complex motivations for capital outflow policy (mentioned in the previous paragraph) by examining the various macroeconomic and fiscal factors at the time when outflow controls were liberalized. 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 extend this novel dataset on capital flow measures to cover the period 2001-2010. The broad majority of changes with respect to outflow controls in the 2000’s were liberalizations. We use this dataset to provide empirical evidence on EME motivations for changing capital controls on outflows.

A second contribution of our paper is that we estimate the revenue from external financial repression which, following Giovannini and de Melo (1993), is the fiscal revenue obtained by preventing residents from freely investing abroad. It is measured as the difference between (effective) external and domestic interest rate on government debt. We update the Giovannini and de Melo measure of external repression revenues for 15 countries, and find that in contrast to the 1980's when many EMEs were found to be earning significant revenues from external repression (averaging 1.4% of GDP), EMEs in the most recent decade earned negative revenues from external repression on average. The negative revenues imply that EME governments faced lower borrowing costs in foreign markets (including valuation changes due to exchange rate fluctuations) than in the domestic market. The decline in external repression revenues has occurred despite the fact that emerging economies (notwithstanding the liberalizations over time) continue to maintain significant restrictions on capital outflows.

There are several implications and interpretations of the negative external repression revenues found in our study. An EME government with positive revenues from repression may stand to lose those revenues by liberalization of outflows, but may find it easier to liberalize outflows to manage the concerns posed by surging NKI when there are no fiscal revenues to be lost. This is in fact what happened: EMEs did liberalize outflow policy substantially in the 2000's. Most of the outflow liberalizations took place in the years of surging NKI (putting downward pressure on domestic interest rates) and rapid economic growth (leading to increasing fiscal revenues from other sources) which suggests that fiscal concerns did not pose a binding constraint for EMEs in this period. A possible interpretation of the negative external repression revenues is that, while many of these EMEs could have borrowed even more in markets abroad in the last decade, they refrained from doing so. That they chose not to borrow more abroad even at favorable interest rates may reflect concerns about greater balance sheet exposure (as most can borrow only in hard currencies) and the fear of a sudden stop. Finally, emerging markets may be reluctant to open more widely the door to capital outflows to preserve the future repression tax base.

The result that concerns related to net capital inflows took predominance over fiscal concerns in the decision to liberalize capital outflow controls in the 2000's finds further support in our empirical exercise. EMEs tightened outflow controls after sudden stops, and high NKI volatility, while they eased when NKI, real exchange rate appreciation pressures, reserves accumulation 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 outflow 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 outflow controls, outlining the hypotheses we test later in the paper. Section III describes the construction of and trends in one of the main data series compiled in the paper – the changes in capital outflow controls. We devote section IV to describing the measures used to capture fiscal concerns, including the second main data series compiled in the paper - revenues from external repression. Section V outlines the econometric methodology, section VI presents the results and section VII concludes.

II. Potential motivations for capital outflow controls

Many motivations have been advanced in the literature for imposing or liberalizing controls on outflows. Capital outflow 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 outflow controls is that these 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 such as interest rate ceilings, high reserves requirements etc., by preventing capital flight in response to these restrictions. This allows 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 external repression averaged about 9 percent of total government revenue from non-repression sources. The large magnitude of the revenues earned from maintaining outflow controls posed potentially a major constraint towards liberalizations of the capital account. Outflow controls can also help governments maximize the inflation tax by limiting the ability of residents to shift to foreign assets.⁶ 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 capital controls were associated with a higher ratio of government consumption to GDP, higher government revenues from seigniorage and lower real interest rates. Alesina et. al. (1994) found that maintaining capital controls led to lower stock of government debt (presumably through lower debt service costs) and that countries with weaker central banks (and therefore lower resistance to use of inflation tax) were 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 outflow controls (as was true for many emerging economies entering into the new millennium), the decision on whether and when to liberalize these controls can be constrained by fiscal reasons discussed above or by 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

⁶ See Dooley (1996) and Eichengreen (2001) for excellent surveys of the literature on these motivations.

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 and aggregate balance sheet exposures, thus giving rise to financial stability concerns. Finally, having resident investments abroad that can be liquidated and brought home at times of slowing economic growth can counter stops in 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 the hypotheses described above, 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.

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 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 relevant regulations applicable to the financial sector. 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.⁷

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

⁷ Further information on the dataset is provided in Appendix A.

magnitude, we think our approach 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 all 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 outflow controls.

The countries in the database include 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 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.⁸

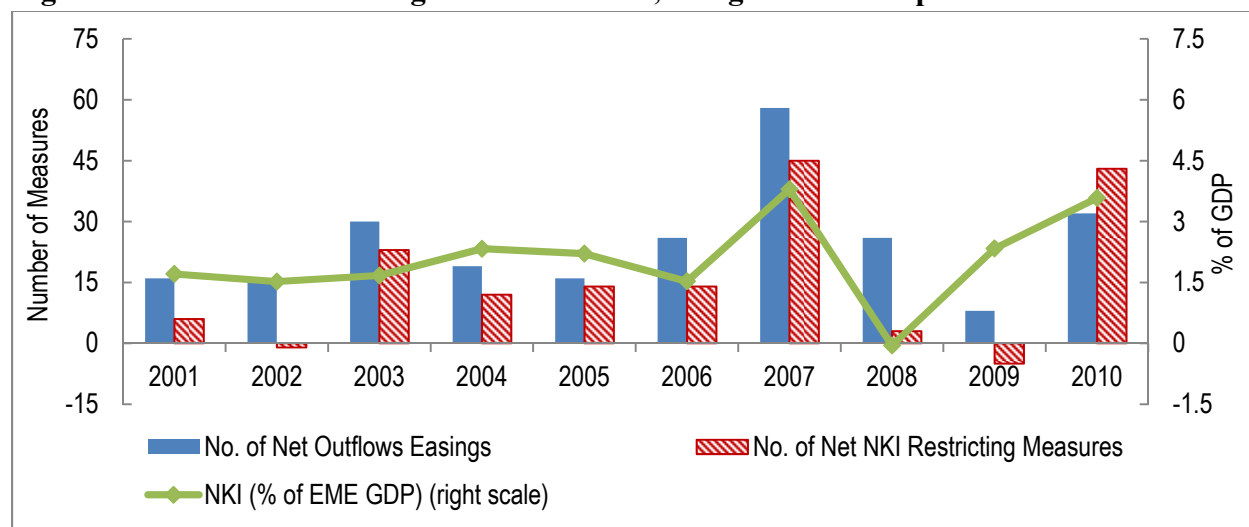
The emerging markets in sample changed their capital outflows policies 302 times over the period 2001-2010, of which 274 changes were easing of restrictions. Since countries could be easing and tightening restrictions on outflows in the same quarter, to gauge the net direction of policy, we compute "net 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

⁸ 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 shows that net NKI restricting measures peaked in 2007 and again in 2010, both peak years for net capital inflows pressures to EMEs. It also shows that outflow liberalizations were the predominant tool for restricting inflows in the 2007 peak, but less so in 2010.

Figure 1: Net Outflows Easings Peaked in 2007, along with Net Capital Inflows



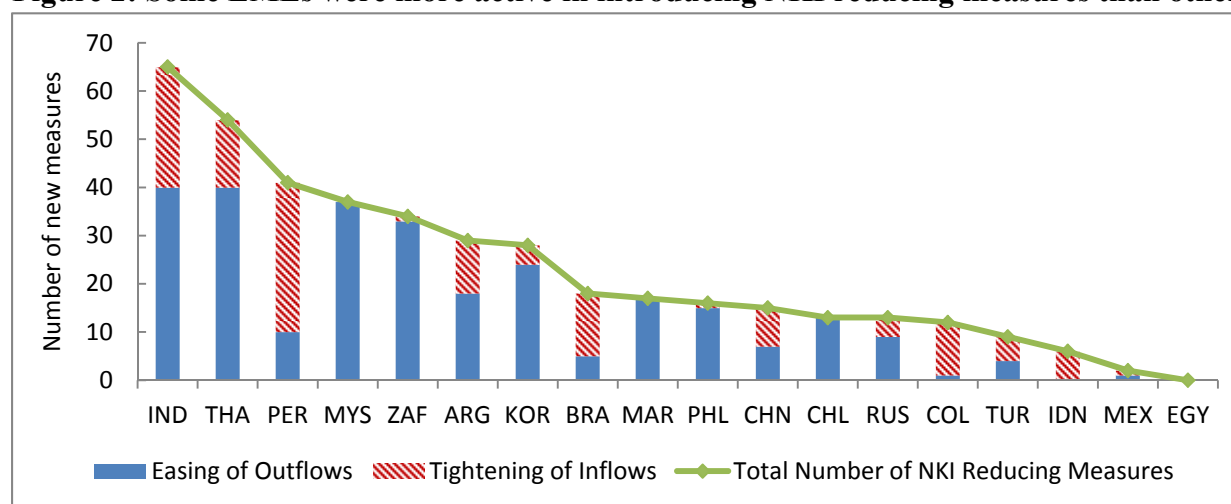
Note: Net capital inflows/GDP is the unweighted sum of NKI to the 18 EMEs in sample divided by the unweighted sum of their nominal GDPs. Net outflows easings are the number of easings of outflows less number of tightening of outflows. Net NKI restricting measures are the sum of net outflows easings and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

There were important differences between countries in terms of the degree of activism on the capital account (Figure 2). India and Thailand were the most active, introducing more than 50 NKI reducing measures over the sample period, whereas Indonesia, Egypt and Morocco the least active in changing capital account policy. There were also differences between countries in terms of the extent to which they relied on tightening of inflow controls or easing of outflow controls as NKI reducing measures. Malaysia, Morocco and Chile relied exclusively on easing of outflows, whereas Indonesia, Peru, Brazil and Colombia used largely inflow tightening measures.

The propensity to change capital outflow controls could be associated with the monetary policy framework and by flexibility of the exchange rate regime of countries (Table 1). EMEs with inflation targeting (IT) monetary policy and freely floating exchange rates on the whole took fewer measures and changed policy less frequently. The last two columns of Table 1 show that a regime with freely floating exchange rates introduced an average of 0.51 measures per quarter, out of which 0.38 measures were NKI reducing measures. This compares to non-freely floating exchange rate regimes, a member of which on average introduced 1.16 measures per quarter, out of which 0.68 measures were NKI reducing measures. The statistics for non-freely floating regimes are very similar to those for non-inflation targeting monetary policy regimes. An IT monetary policy regime introduced an average of 0.72 measures per quarter, out of which 0.53 measures were NKI reducing measures. For all country groups, outflow easings were the majority of NKI reducing measures. However, in contrast to freely floating exchange rate

regimes, IT regimes relied relatively less on outflow easing measures and more on inflow tightening measures: 62% of NKI reducing measures introduced by IT regimes were outflow easings, compared to 84% of NKI reducing measures introduced by freely floating exchange rate regimes.

Figure 2: Some EMEs were more active in introducing NKI reducing measures than others



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 external financial repression.

IV. Measures of Fiscal Concerns

In order to capture the extent to which lost fiscal revenues would constrain the removal of capital outflow controls, we deploy several measures of fiscal concerns. The first and the most direct measure of contribution of outflow controls to fiscal revenues is the revenue from external repression, which we describe in the next sub-section. The other measures of fiscal concerns, described in sub-section IV.B below seek to capture the fiscal space of the government as well as the revenue from the use of internal repression that capital outflow controls facilitate.

A. External Repression Revenues in EMEs

The main purpose of capital outflow controls is to keep the domestic cost of borrowing for the government below the rate that would prevail in a fully integrated economy. Therefore, external repression revenue can be defined as the additional cost the government would have to bear to service its domestic debt in the absence of outflow controls. Thus defined, external repression

revenue can be measured by the difference between the effective interest rate on the government's foreign borrowing 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:

$$i = \frac{\text{Interest Payments on Domestic Debt}_t}{(\text{Domestic Debt Outstanding}_t + \text{Domestic Debt Outstanding}_{t-1})/2}$$

where interest payments and debt outstanding are measured in local currency units (LCU).⁹ 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:

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.

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

The nominal dollar interest rate is computed on non-concessional public and publically guaranteed (PPG) external debt from private creditors.¹⁰

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.

$$\text{FX component} = i^* \cdot (\text{Percent Depreciation of LCU/USD exchange rate})$$

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

In addition, there is a third component of effective interest rate on external debt, the "debt revaluation cost". This cost consists of two elements: (a) 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 (b) the USD revaluation cost, defined as the increase in dollar value of debt

⁹ Full details on the data and construction of external repression revenues are in Appendix B.

¹⁰ 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.

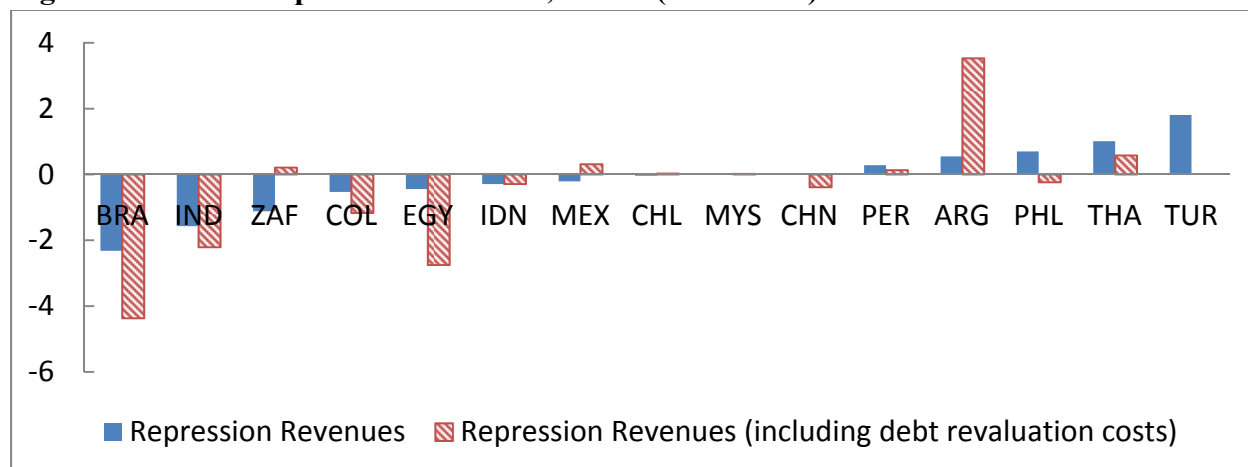
outstanding (repayable) due to appreciation of the dollar against the currencies of denomination of external debt. Debt revaluation cost represents accrued costs and is amortized over the duration of the loan, rather than over the course of a single year. In this paper, our base measure of repression revenues includes only the nominal dollar interest rate and the FX component. While we also compute the debt revaluation cost (and provide summary statistics on the repression revenues including it), we do not include it in our base measure of external 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 cost.¹¹

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.

Trends in external repression revenues

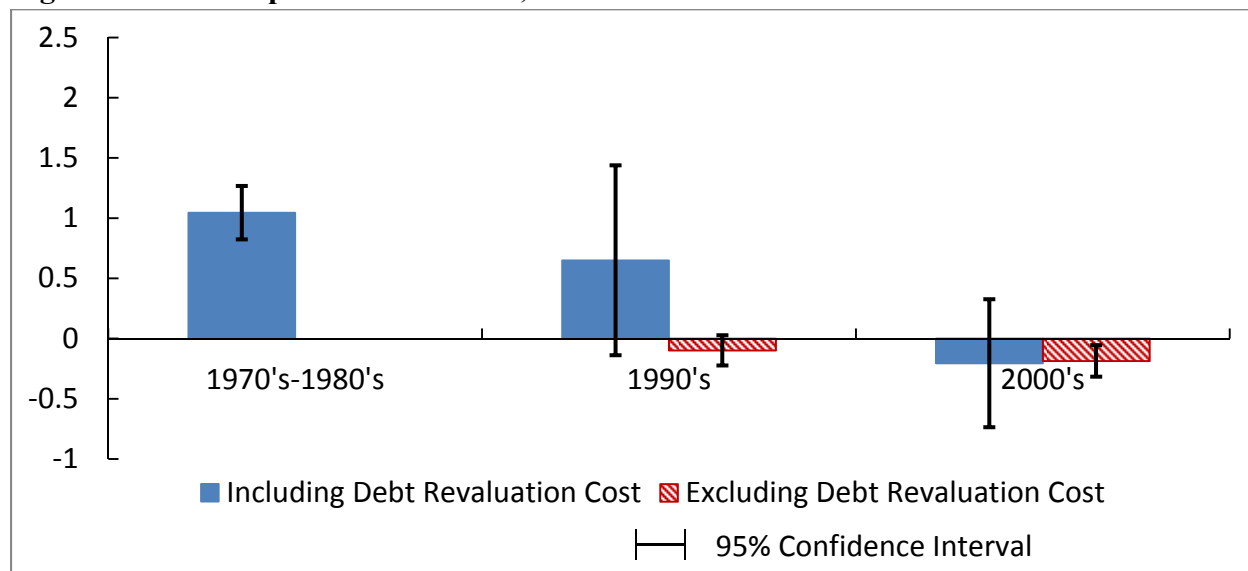
The median external repression revenues in the 2000's for 8 of the 15 countries for which we had data, were negative (Figure 3). For another 3 countries, the median revenue as a percentage of GDP was less than 0.5% of GDP. These represent significant declines from the 1980's, when Giovannini and de Melo estimated the average revenue to be about 1.4% of GDP (Figure 4).

Figure 3: Median Repression Revenues, 2000's (% of GDP)



¹¹ 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 of EMEs but also due to greater flexibility of their exchange rates.

Figure 4: Mean Repression Revenues, % of GDP

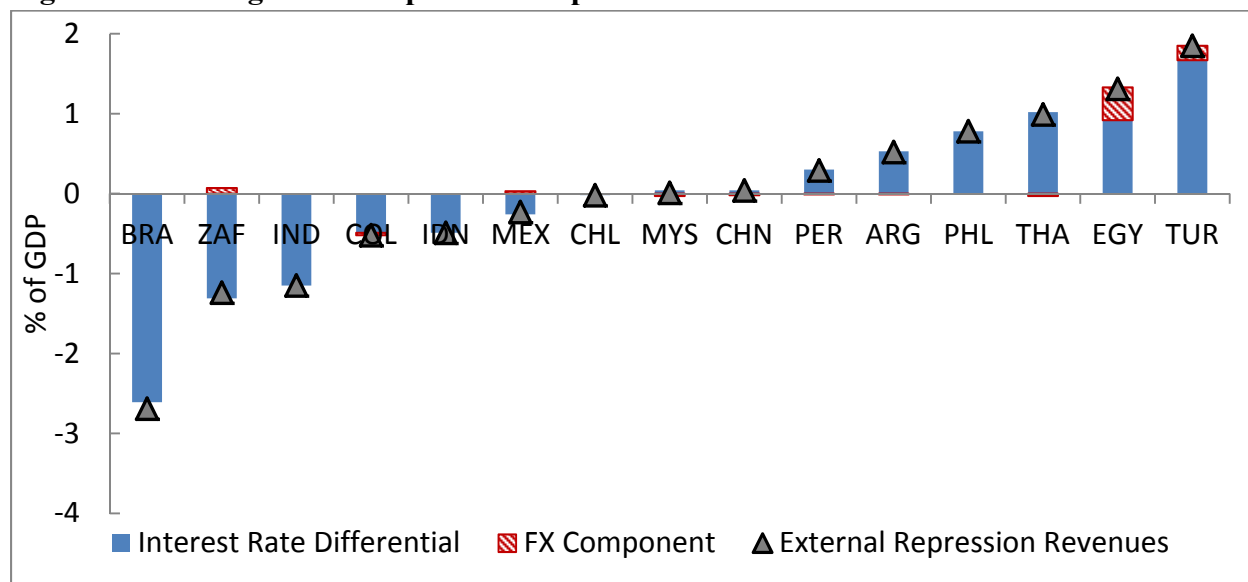


Notes: The 1980's mean is from Giovannini and de Melo (1993) and covers the countries in their sample that overlap with ours. The 1980's values are in fact over those years between 1974 and 1987 for which the Giovannini and de Melo estimates are available. The 1990's estimates are for the years 1995-1999, or the years for which data for each country is available.

Why have external repression revenues declined?

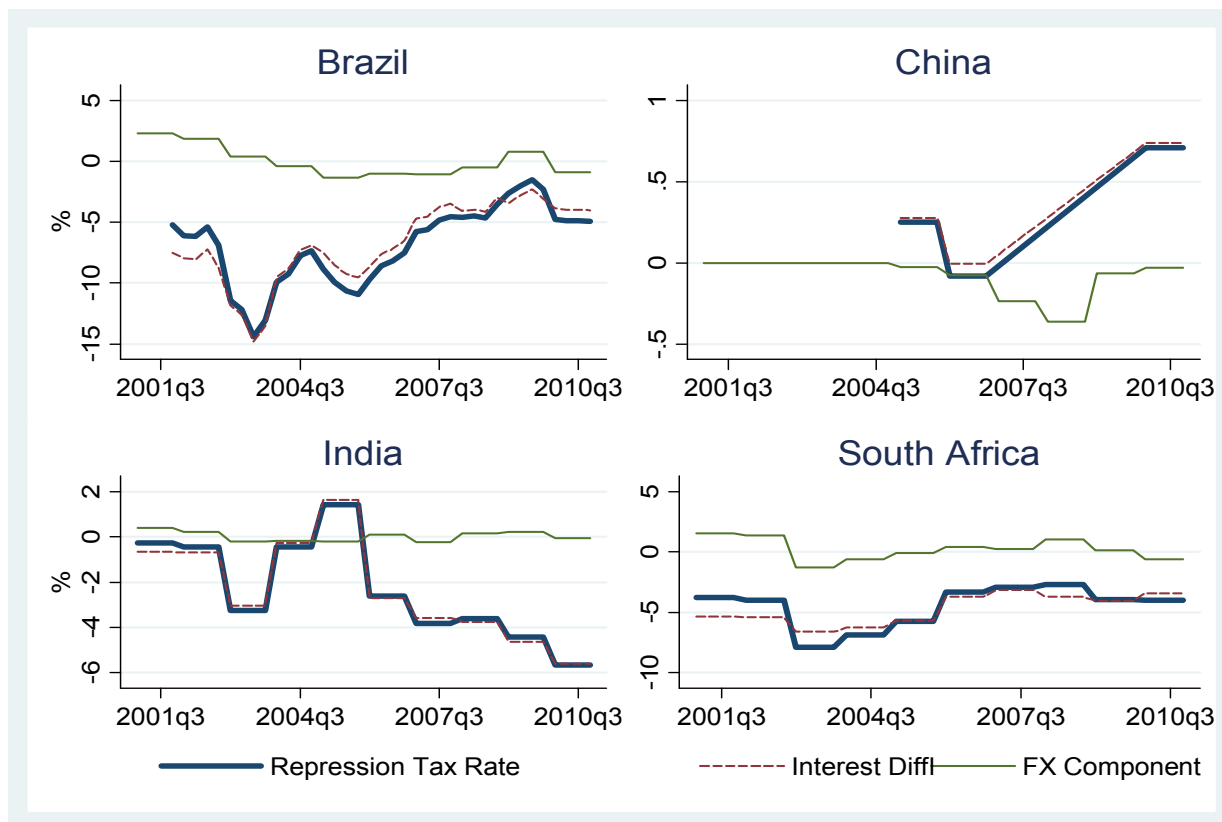
Most of the difference between external effective and domestic interest rate in 2000's is due to the difference between the dollar external interest rate and the domestic interest rate (Figures 5 and 6). In contrast to the 1980's, the FX component is a small part of effective interest rate differentials for most EMEs. The decline in the external repression revenues therefore reflects both the decline in the external dollar interest rate and the decline in the FX component.

Figure 5: Exchange rate component of repression revenues is small for most countries



Notes: The plotted values are the means of the variables for the 2000's for each country.

Figure 6: Components of Repression Revenues – BRICS



Several factors can explain the decline in the two components of external repression revenues, many of them related to the growth accelerations of EMEs in 2000's (in comparison to 1970-1980s). The relatively strong growth performance of EMEs vis-à-vis the rest of the world in that period in combination with the easing of monetary policy in the advanced economies led to an overall decline in their external risk premia. Strong domestic demand growth and a shortage of capital in EMEs drove up domestic interest rates and this effect could not fully be counteracted by net capital inflows (given remaining restrictions on these inflows). It also led to a real exchange rate appreciation trend, which contributed to the decline in FX component.

Another possible reason for our low estimates of external repression revenues is that in a period of strong EME growth, the external risk premia may have declined too much.¹² Our measure assumes that the external interest rate represents the "market interest rate" for government debt that would prevail in absence of outflow controls. 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 internal financial repression measures, they are able to finance their borrowing needs largely domestically, without pushing up interest rates

¹² 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.

on their debt and their debt burdens. Therefore, the market interest rate they would face in the absence of external repression could be substantially underestimated by the prevailing 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).

Interpretation of negative repression revenues

There are several implications and interpretations of the negative external repression revenues found in our study. Liberalization of outflows by EMEs with negative external repression revenues (other things being equal) could in theory lead to a further increase in their domestic interest rate over the external rate. An EME government concerned about cost of servicing the domestic debt would either not liberalize outflows, do so in tandem with liberalizing inflows or borrow more in markets abroad (liberalizing inflows only for itself). In practice, the fiscal concerns did not prevent outflow liberalizations - EMEs did liberalize outflow policy substantially in the 2000's. However, this was made possible by surging inflows, as most of the liberalizations took place in the years of high NKI (putting downward pressure on domestic interest rates) and rapid economic growth (leading to increasing fiscal revenues from other sources). This suggests fiscal concerns did not pose a binding constraint to outflow liberalization in the 2000's.

A possible interpretation of the negative external repression revenues is that, while many of these EMEs could have borrowed even more in markets abroad in the last decade, they refrained from doing so. That they chose not to borrow more abroad even at favorable interest rates may reflect concerns about greater balance sheet exposure (as most can borrow only in hard currencies) and the fear of a sudden stop. In the event of a sudden stop and the associated sharp exchange rate depreciation, EMEs with larger external debt denominated in foreign currencies would experience a sharper increase in the cost of servicing the debt and more limited external debt refinancing opportunities. The challenges faced by South Korea and Mexico during the 2008-9 crisis would reinforce the concerns about the risks of sudden stops in bad times even in relatively developed EMEs.¹³ Finally, emerging markets may be reluctant to open more widely the door to capital outflows to preserve the future repression tax base.

B. Other measures of fiscal concerns in EMEs

Being a measure of external repression, our measure of financial repression does not take into account the revenues that internal financial repression measures (interest rate controls, directed

¹³ These considerations also suggests that a drawback of the Giovannini and de Melo (1993) financial repression measure is focusing on the first moment (expected interest rate cum exchange rate depreciation), overlooking the second moment (exposure to future volatility associated with costly external debt refinancing at times of crisis).

credit, high reserve requirements, etc. that would be ineffective without capital controls) generate for the government. That is to say, our measure of repression does not measure the extent to which the domestic interest rate is below the domestic rate that would prevail in absence of internal repression (and in presence of capital controls). In addition, it does not take into account the seignorage tax revenue, the savings to the government from sterilization and the costs imposed on households that accrue to corporations or banks, rather than to the governments. Recent literature suggests that the size of implicit taxes generated via the banking sector in EMEs can be substantial. 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."

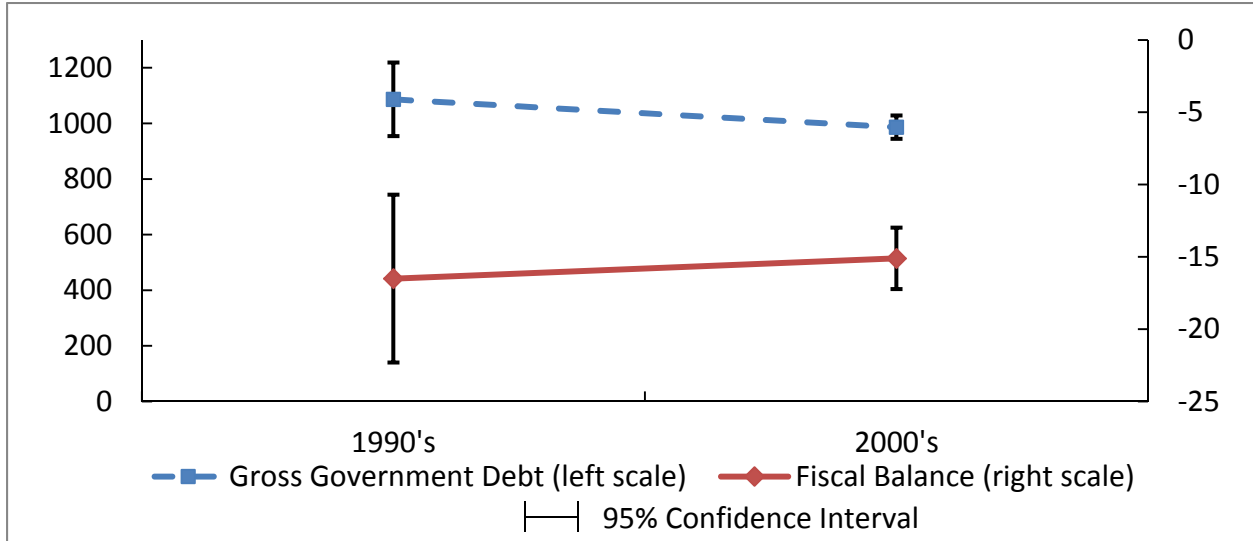
To capture some of the contribution to fiscal policy of internal repression revenues, we use several measures of fiscal space and of internal repression. These include:

1. Measures of fiscal space:
 - a. Fiscal balance as a share of government tax revenues
 - b. Gross government debt as a share of government tax revenues
2. Measures of fiscal internal repression revenues:
 - a. Liquidation tax (negative of the real interest rate on domestic government debt)
 - b. Real deposit interest rate on domestic government debt
 - c. Banking sector net lending to government as a share of banking sector assets*Inflation. This measure captures the extent to which the government is able to allocate banking savings to itself and tax it through inflation.

Consistent with the decline in external repression revenues, measures of fiscal space and of internal repression revenues in EMEs have also improved over time. Government debt has declined as a percentage of tax revenues and the fiscal balance has improved substantially, potentially allowing the governments room to liberalize outflow controls (Figure 7). The inflation tax the governments obtained from captive lending to it by the banking sectors has also declined substantially between the 1990's and 2000's (Figure 8). The real deposit interest rate on banking sector deposits has been positive on average during both 1990's and 2000's and governments have been paying positive real interest rates on its domestic debt (implying negative liquidation taxes).

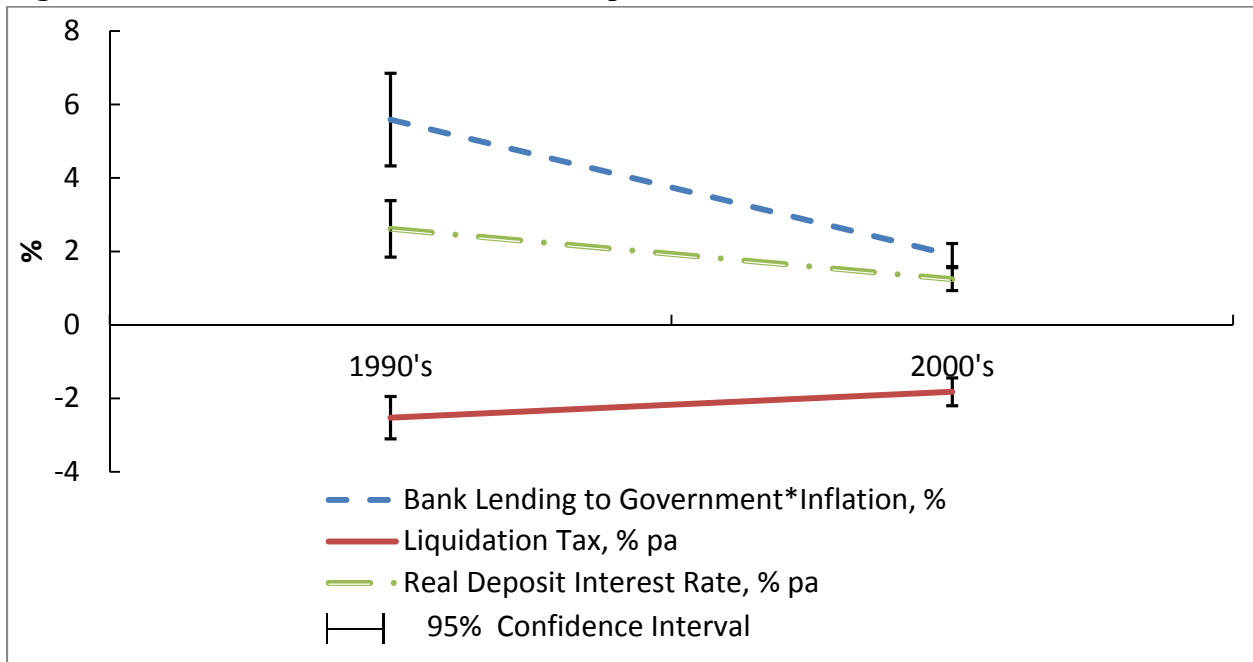
The fact that EME growth was stronger and less volatile in 2000's may have also led to a lesser need for repression revenues. Indeed, the average tax-GDP ratios for EMEs increased by 2 percentage points to 15.2% of GDP in 2000's from the 1990's (Figure 9).¹⁴

Figure 7: Mean Gross Government Debt and Fiscal Balance, % of Tax Revenues



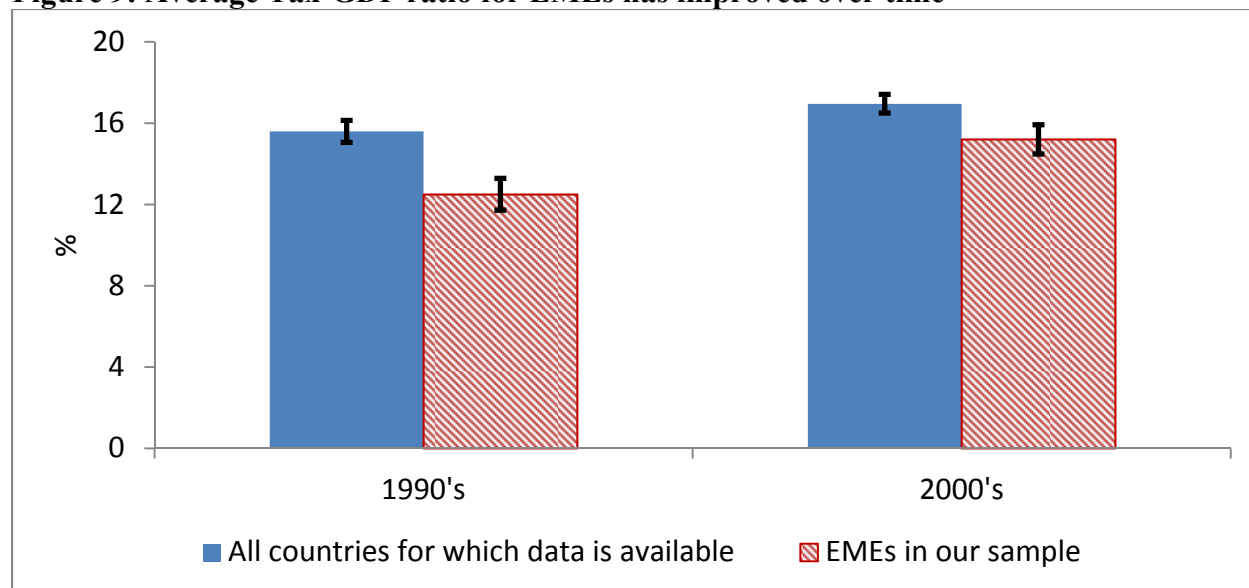
Notes: The plotted values are mean for all EMEs in the decade and the 95% confidence interval around the mean.

Figure 8: Measures of Internal Financial Repression



¹⁴ 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)].

Figure 9: Average Tax-GDP ratio for EMEs has improved over time



Source: World Bank WDI

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:

$$\text{Number of Net Easings}_{it} = \alpha + \beta X_{it-1} + v_i + u_t + e_{it}$$

where X_{it-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.¹⁵ We tested a number of indicators for each of the hypotheses identified in section II above, i.e. the fiscal, overheating concerns, concerns about macroeconomic stability, foreign exchange valuation concerns and financial stability concerns. These variables and the expected signs of their coefficients are listed below¹⁶:

¹⁵ Since the number of net easings can be both positive and negative, models like tobit and probit are not appropriate for use with our data.

¹⁶ The data appendix Table A.3 lists the data sources and granularity of each variable and Table A.4 provides their summary statistics.

Fiscal Concerns:

1. Measures of fiscal space: Expected sign is (+) as more fiscal space allows liberalization
 - (i) Fiscal Balance/Tax Revenues: (+);
 - (ii) Government Debt/Tax Revenues: (-)
2. Revenue from external repression: Expected sign is (-) as higher revenues from repression curtail incentive to liberalize
3. Liquidation Tax: This variable is the negative of the real interest rate on domestic government debt. Expected sign is (-) as higher tax means more potential revenue that could be lost by liberalization and therefore lower incentive to liberalize
4. Real deposit rate on bank deposits: Expected sign is (+) as lower rate suggests greater internal repression and therefore lower incentive to liberalize
5. Banking Sector Net Lending to Govt*Inflation: Expected sign is (-) as higher values imply greater revenues from internal repression

NKI Concerns: The variables measuring NKI concerns are grouped by hypotheses:

I. Concerns about "overheating": Greater overheating pressures would create incentive to liberalize, in order to reduce the size of NKI

1. We use two variables that capture the size of the NKI. Expected sign of these variables is (+) as higher NKI would prompt easing of outflow controls.
 - (i) NKI/GDP
 - (ii) NKI surge dummy
2. Credit growth (+)
3. Credit gap (+): This variable is the ratio of Domestic Credit/GDP to its 3-year trend.
3. Inflation rate (+): yoy change in CPI
4. GDP growth (+): yoy growth in real GDP

II. Concerns about Macro-stability:

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

III. Concerns about FX valuation:

1. REER appreciation over the past year (+)
2. Change in FX reserves/GDP: (+)
3. FX regime (freely floating=1) (-)
4. IT Monetary Policy dummy (-)
5. Exchange Market Pressure (EMP): This variable is defined as the sum of exchange rate depreciation and reserve outflows (scaled by reserve money). Higher values of this variable indicate greater depreciation pressure. Expected sign is (-) as greater depreciation

pressure would create incentive to tighten outflow controls.

6. Undervaluation (PPP-based) (-)

IV. Concerns about Financial Stability:

1. Balance Sheet Exposure: This variable is defined as $(\text{External Debt} - \text{Reserves})/\text{GDP}$. The expected sign is (-) as countries with higher balance sheet exposure may want to limit current and future outflows (in the event of a crisis).

2. Short Term Balance Sheet Exposure (-): $(\text{Short Term External Debt} - \text{Reserves})/\text{GDP}$

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. Inflation Crisis (-)

8. Banking crisis: (-)

VI. Other controls:

1. Trade/GDP: Expected sign is (+) as effectiveness of existing controls would decrease with greater trade openness.

2. Chinn-Ito index of capital account openness: Expected sign is (-) as more open countries are expected to have liberalized less as they had fewer controls left to remove.

3. Quinn index of capital account openness: (-)

4. Net tightening of inflows (+/-): Both easing of outflows and tightening of inflows are net capital inflows reducing measures, and therefore may be substitutes. However, countries facing a large NKI surge may be tempted to try both.

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. All the explanatory variables are lagged one quarter. We also drop outliers, which are defined as observations that lie more than 5 standard deviations from the mean of each variable for all explanatory variables. In addition, extreme values of net easings of outflows and number of net tightening of inflows are also considered outliers (greater than or equal to 9 and less than or equal to -8 for net easing of outflows and outside the range (-8,8) for net tightening of inflows) and excluded from the reported regression results.

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 the first stage for the fiscal concerns and the multivariate regressions. The number of zeros in the left hand side variable is large, as the dataset is quarterly and outflows policy does not change every quarter for most countries. Using OLS on the dataset would tend to produce estimates of coefficients that are biased towards zero and have inflated standard errors. As a robustness check, we also performed the second stage regression after dropping all the zeros – results are consistent with those described in the paper, and are available on request.

VI. Results

The first stage results for the fiscal variables are in Table 2 below. In the full sample of countries none of the fiscal variables are significant at conventional levels of significance suggesting that (in contrast to the 1980's) these variables were not important in the decision to change capital outflow policy. In order to compare the fiscal and the NKI motivations, we report the second stage regressions with both sets of indicators in Table 3. 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)-(7) and then jointly in columns (8)-(11).

We find that among the two hypotheses, most of the significant variables are associated with concerns related to NKI – stock price inflation, exchange market pressure, short term balance sheet exposure, NKI and REER volatility.. The largest coefficients are of short term balance sheet exposures and NKI volatility and suggest that countries with higher short term external debt relative to reserves and high volatility in net capital inflows were more reluctant to liberalize. Further, more open EMEs liberalized less frequently than less open EMEs. Fiscal balance variable has a positive sign and is significant in some regressions, suggesting that countries with better fiscal positions liberalized more –however the measures of internal or external repression revenues are not significant.¹⁷

Figure 2 showed that 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 outflow easings in sample, whereas India, Malaysia, Thailand and South Africa had more than 30. Part of this difference across countries may be explained by the different composition of NKI reducing measures, but the difference in frequency of changes across countries may also reflect the existing level of capital controls and their preference for managing NKI through

¹⁷ The R-squares in the regressions are not very high and we do not explain more than 17% 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 121 non-zero net easings of outflows in our sample of 456 observations used in the second to fourth columns of Table 3.

capital account policy. These preferences for using capital outflow policy may be captured by their exchange rate and monetary policy regimes.

To take into account the considerations described above, we divided the countries into groups according to their degree of capital outflow openness at the beginning of sample period, their exchange rate regime and whether or not they had a monetary policy with an explicit inflation target. We use Schindler's index of outflow restrictions in the year 2000 to group countries into those that had higher than median restrictions to begin with (more closed economies) and those with median restrictions (more open economies). More closed economies would have greater room to liberalize outflow controls but may also have greater fiscal constraints on the liberalization. We used IMF AREAER classification to group countries as having freely floating and non-freely floating exchange rates and into countries that had an explicit inflation targeting (IT) monetary policy, and those that did not. As Table 1 showed, non-flexible exchange rate regimes non-IT countries used net outflows easings more frequently than others. Further, as table 4 below shows, they were also less open to capital and trade, had worse fiscal balances and higher repression revenues on average than their counterparts.

The results for subgroups of countries that were less open, that had a non-flexible exchange rate regime and for countries that had IT and non-IT monetary policy regimes are in Tables 5-8 respectively.¹⁸ The results of the sub-groups are very similar to those for the full sample. The concerns about size and volatility of net capital inflows and the resulting overheating, balance sheet exposures and appreciation pressures are still the most important explanatory variables. However, for the closed economies and for the non-IT targeting monetary policy regimes, the measures of internal and external repression revenues are also significant. Economies are less likely to ease when repression revenues are higher and more likely to ease when fiscal balances are higher. The anomaly is the sign of the liquidation tax variable which suggests that countries with higher liquidation tax liberalized more. However, this may simply reflect the fact that liquidation tax was negative for most countries in our sample.

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. Emerging market economies (EMEs) facing sudden stops, high volatility in net capital inflows and higher balance sheet exposures liberalized less. Countries eased more in response to higher net capital inflows, and when these inflows 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

¹⁸ The number of non-zero observations of the dependent variable for country groups open economies, flexible exchange rate regimes was very low – we therefore do not report these results.

outflow controls - only in the sample of relatively closed and 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 external 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 2008-2009 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 favorable 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).

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

	All Measures	Outflow Easings	Outflow Tightenings	Net Outflow Easings	Inflow Tightenings	NKI Reducing Measures	All Measures	NKI Reducing Measures	Outflow Easings, % of NKI Reducing measures
	<i>(A)</i>	<i>(B)</i>	<i>(C)</i>	<i>(D)=(B)-(C)</i>	<i>(E)</i>	<i>(F)=(B)+(E)</i>	<i>(Measures Per Country-Quarter)</i>		
	<i>(Total Number of Measures)</i>						<i>(Measures Per Country-Quarter)</i>		
IMF Exchange Rate Classifications									
Freely Floating	124	76	6	70	15	91	0.51	0.38	84
Non-Freely Floating	540	198	22	176	120	318	1.16	0.68	62
IMF Monetary Policy Framework									
Inflation Targeting (IT)	286	130	9	121	79	209	0.72	0.53	62
non-IT	378	144	19	125	56	200	1.22	0.65	72
Total	664	274	28	246	135	409	0.94	0.58	67

Note: All measures include outflow easings and tightenings and inflow easings and tightenings. Non-Freely Floating exchange rate classifications include soft pegs, floating and other regimes, as classified by IMF.

Table 2: Role of fiscal concerns in decisions to liberalize capital outflows

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
IT Monetary Policy	-0.12 (0.16)	-0.12 (0.17)	0.07 (0.14)	0.06 (0.15)	0.03 (0.14)	-0.12 (0.16)	-0.11 (0.16)	0.09 (0.12)	0.07 (0.14)
Free Floating Exchange Rate Regime	0.01 (0.13)	0.00 (0.13)	-0.22* (0.12)	-0.19 (0.12)	-0.15 (0.13)	-0.08 (0.12)	-0.08 (0.12)	-0.10 (0.12)	-0.07 (0.14)
Capital Account Openness (Chinn-Ito)	-0.31* (0.16)	-0.30* (0.15)	-0.21 (0.15)	-0.23 (0.16)	-0.24 (0.17)	-0.33** (0.14)	-0.31** (0.14)	-0.18 (0.15)	-0.27 (0.18)
No. of Net Tightenings of Inflow Controls	0.06 (0.07)	0.06 (0.07)	0.08 (0.07)	0.08 (0.07)	0.06 (0.07)	0.08 (0.07)	0.08 (0.07)	0.07 (0.07)	0.05 (0.08)
Fiscal Balance/Tax Revenues, %	0.05 (0.06)							0.07 (0.10)	0.11 (0.10)
Gross Govt. Debt/GDP, %		-0.02 (0.10)						-0.07 (0.10)	0.05 (0.16)
Repression Revenues/GDP, %			-0.05 (0.07)					-0.02 (0.07)	
Repression Revenues (incl. debt revaluation costs)/GDP, %				-0.03 (0.03)					
Liquidation Tax					0.04 (0.06)			0.09 (0.12)	0.04 (0.12)
Real Deposit Rate						-0.02 (0.04)		-0.02 (0.08)	0.00 (0.08)
(Bank Lending to Govt/ Bank Assets)*Inflation							0.04 (0.04)	-0.02 (0.15)	0.04 (0.10)
Observations	623	623	470	470	497	667	667	461	488
R-squared	0.09	0.09	0.12	0.12	0.10	0.10	0.10	0.12	0.10
Number of Countries	18	18	15	15	16	18	18	15	16

Notes: All regressions include time fixed effects; Clustered standard errors in parentheses; ***p<0.01, **p<0.05, *p<0.1.

All explanatory variables are lagged one quarter. All variables, except dummies and number of easings/tightenings have been normalized and outliers have been removed.

Table 3: Full Sample. Dependent Variable: Number of Net Easings of Outflow Controls

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
IT Monetary Policy	0.05 (0.12)	-0.11 (0.16)	-0.11 (0.16)	-0.10 (0.16)	-0.06 (0.13)	-0.10 (0.16)	0.04 (0.13)	0.12 (0.12)	0.09 (0.12)	0.05 (0.12)	0.03 (0.13)
Free Floating Exchange Rate Regime	-0.19 (0.19)	-0.09 (0.19)	-0.05 (0.19)	-0.07 (0.19)	-0.12 (0.19)	-0.08 (0.19)	-0.11 (0.16)	-0.17 (0.19)	-0.15 (0.17)	-0.22 (0.21)	-0.24 (0.21)
No. of Net Tightenings of Inflow Controls	0.08 (0.07)	0.06 (0.07)	0.06 (0.07)	0.06 (0.07)	0.07 (0.09)	0.06 (0.07)	0.09 (0.07)	0.10 (0.09)	0.10 (0.09)	0.11 (0.09)	0.11 (0.10)
Capital Account Openness (Chinn-Ito)	-0.32* (0.15)	-0.39** (0.16)	-0.36** (0.16)	-0.40** (0.16)	-0.35** (0.14)	-0.41** (0.15)	-0.25* (0.14)	-0.27* (0.14)	-0.26* (0.13)	-0.32* (0.15)	-0.32* (0.15)
Fiscal Concerns											
Fiscal Balance/GDP, %	0.13* (0.07)	0.15* (0.08)	0.14* (0.08)	0.14* (0.07)	0.08 (0.14)	0.15* (0.08)	0.12 (0.08)	0.03 (0.14)	0.03 (0.15)	0.04 (0.14)	0.04 (0.15)
Liquidation Tax	0.12 (0.11)	0.10 (0.14)	0.11 (0.11)	0.10 (0.11)	0.09 (0.12)	0.11 (0.11)	0.15 (0.10)	0.19 (0.15)	0.12 (0.10)	0.14 (0.10)	0.07 (0.20)
Repression Revenues/GDP, %	-0.14 (0.16)							-0.11 (0.14)			
(Bank Lending/Total Bank Assets)*Inflation		0.00 (0.13)						-0.15 (0.16)			
NKI Concerns											
Change in Stock Prices, (% yoy)	0.13** (0.05)	0.15*** (0.03)	0.15*** (0.03)	0.15*** (0.03)	0.14*** (0.04)	0.15*** (0.03)	0.15*** (0.03)	0.14*** (0.04)	0.15*** (0.04)	0.16** (0.05)	0.16** (0.05)
Gross Inflow Stop	-0.21* (0.11)	-0.23** (0.10)	-0.19 (0.11)	-0.17 (0.11)	-0.20 (0.12)	-0.24** (0.10)	-0.27** (0.10)	-0.21 (0.12)	-0.20 (0.12)	-0.12 (0.14)	-0.12 (0.15)
Flight	-0.18 (0.12)	-0.13 (0.12)	-0.11 (0.12)	-0.13 (0.13)	-0.04 (0.09)	-0.14 (0.12)	-0.15 (0.12)	-0.09 (0.09)	-0.07 (0.08)	-0.03 (0.11)	-0.03 (0.11)
REER Volatility	0.10* (0.05)	0.11* (0.05)	0.12** (0.05)	0.11* (0.06)	0.11* (0.05)	0.10 (0.06)	0.14*** (0.04)	0.13* (0.07)	0.11** (0.05)	0.09* (0.04)	0.09* (0.05)
NKI Volatility	-0.27** (0.11)	-0.34** (0.13)	-0.36** (0.13)	-0.32** (0.13)	-0.38** (0.13)	-0.33** (0.12)	-0.32*** (0.09)	-0.34*** (0.10)	-0.34*** (0.09)	-0.39*** (0.10)	-0.38*** (0.10)
NKI/GDP, %			0.10 (0.08)					-0.01 (0.08)	0.00 (0.08)	-0.03 (0.08)	-0.03 (0.08)
EMP				-0.11** (0.04)				-0.08** (0.03)	-0.08** (0.03)	-0.08** (0.03)	-0.08** (0.03)
Δ (Reserves/GDP, %)					0.05 (0.08)			0.03 (0.08)	0.02 (0.08)	0.06 (0.08)	0.06 (0.08)
REER Appreciation						0.04 (0.04)		0.03 (0.04)	0.03 (0.04)	0.06 (0.04)	0.06 (0.04)
(Short Term External Debt- Reserves)/GDP, %							-0.39*** (0.08)	-0.29*** (0.07)	-0.29*** (0.06)	-0.25*** (0.07)	-0.24*** (0.06)
Real GDP Growth, (% yoy)										0.14 (0.09)	0.14 (0.09)
Trade/GDP, %										0.18 (0.32)	0.15 (0.32)
Inflation, %											0.08 (0.19)
Observations	429	456	456	456	440	456	432	413	416	408	408
R-squared	0.14	0.13	0.13	0.13	0.13	0.13	0.15	0.16	0.16	0.17	0.17
Number of Countries	14	15	15	15	15	15	14	14	14	13	13

Notes: All regressions include time fixed effects; Clustered standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1. All explanatory variables are lagged one quarter. All variables, except dummies and number of easings/tightenings have been normalized and outliers have been removed.

Table 4: Countries with IT monetary policy and freely floating exchange rates were different than their counterparts in terms of openness and fiscal outcomes

	Capital Account Openness		Trade/GDP	Fiscal Balance/Tax	Repression
	Quinn Index	Chinn-Ito Index	(%)	Revenues (%)	Revenues/GDP (%)
Non-IT Countries	50.6	-0.12	74.01	-19.52	0.04
IT Countries	68.89	0.31	64.13	-8.93	-0.32
non-Freely Floating Exchange Rate Regimes	55.4	0.11	71.8	-15.89	0.01
Freely Floating Exchange Rate Regimes	71.38	0.14	62.03	-8.82	-0.51

Table 5: Less Open Economies (Countries with higher than median capital outflow controls in 2000); Dependent Variable: Number of Net Easings of Outflows

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
IT Monetary Policy	-0.17 (0.24)	-0.33 (0.26)	-0.26 (0.29)	-0.23 (0.29)	-0.13 (0.27)	-0.32 (0.26)	-0.08 (0.18)	0.13 (0.21)	0.13 (0.30)	0.35 (0.33)	0.35 (0.31)
Free Floating Exchange	-0.68 (0.42)	-0.20 (0.57)	-0.17 (0.50)	-0.20 (0.52)	-0.21 (0.50)	-0.27 (0.54)	-0.19 (0.59)	-0.21 (0.45)	-0.08 (0.53)	-0.08 (0.52)	-0.13 (0.50)
Rate Regime	0.14 (0.12)	0.11 (0.13)	0.11 (0.13)	0.12 (0.13)	0.13 (0.17)	0.13 (0.13)	0.16 (0.13)	0.18 (0.16)	0.19 (0.17)	0.22 (0.19)	0.23 (0.20)
No. of Net Tightenings of Inflow Controls	-0.47* (0.23)	-0.49** (0.19)	-0.44* (0.20)	-0.49** (0.20)	-0.48* (0.24)	-0.53** (0.17)	-0.43* (0.21)	-0.70** (0.22)	-0.51** (0.19)	-0.71** (0.21)	-0.72** (0.24)
Fiscal Concerns											
Fiscal Balance/GDP, %	0.13 (0.10)	0.16 (0.11)	0.16 (0.11)	0.15 (0.11)	0.09 (0.19)	0.16 (0.11)	0.11 (0.10)	0.03 (0.19)	0.02 (0.19)	0.06 (0.18)	0.06 (0.18)
Liquidation Tax	0.32 (0.18)	0.49* (0.22)	0.36* (0.19)	0.38* (0.19)	0.40 (0.25)	0.40* (0.19)	0.29 (0.18)	0.84*** (0.20)	0.30 (0.22)	0.43** (0.16)	0.31 (0.31)
Repression Revenues/GDP, %	-0.38* (0.19)							-0.47** (0.13)			
(Bank Lending/Total Bank Assets)*Inflation		-0.22 (0.30)						-0.94** (0.36)			
NKI Concerns											
Change in Stock Prices, (% yoy)	0.07 (0.09)	0.13** (0.05)	0.13* (0.06)	0.11* (0.06)	0.11* (0.05)	0.10 (0.06)	0.16* (0.08)	0.07 (0.11)	0.12 (0.11)	0.12 (0.12)	0.12 (0.12)
Gross Inflow Stop	-0.53** (0.17)	-0.58* (0.29)	-0.54* (0.28)	-0.50* (0.27)	-0.53 (0.33)	-0.59* (0.29)	-0.47** (0.18)	-0.48 (0.34)	-0.40 (0.29)	-0.36 (0.46)	-0.37 (0.48)
Flight	-0.11 (0.20)	-0.04 (0.23)	-0.05 (0.23)	-0.07 (0.24)	0.08 (0.20)	-0.05 (0.24)	-0.21 (0.26)	0.11 (0.23)	-0.01 (0.21)	0.04 (0.25)	0.04 (0.25)
REER Volatility	0.01 (0.07)	0.18 (0.12)	0.17 (0.12)	0.15 (0.12)	0.18 (0.17)	0.09 (0.16)	0.18 (0.13)	-0.01 (0.17)	0.05 (0.22)	0.16 (0.25)	0.16 (0.26)
NKI Volatility	-0.29 (0.17)	-0.49** (0.18)	-0.50** (0.16)	-0.45** (0.18)	-0.47** (0.18)	-0.43** (0.17)	-0.41* (0.20)	-0.37* (0.19)	-0.43* (0.19)	-0.56** (0.16)	-0.55** (0.15)
NKI/GDP, %			0.09 (0.12)					-0.05 (0.14)	0.02 (0.11)	-0.07 (0.11)	-0.07 (0.11)
EMP				-0.11** (0.03)				-0.07* (0.04)	-0.05 (0.04)	-0.06 (0.03)	-0.06 (0.04)
Δ (Reserves/GDP, %)					0.06 (0.10)			0.10 (0.10)	0.04 (0.12)	0.13 (0.12)	0.13 (0.12)
REER Appreciation						0.08 (0.07)		0.09 (0.07)	0.12* (0.05)	0.17*** (0.03)	0.17*** (0.03)
(Short Term External Debt- Reserves)/GDP, %							-0.57* (0.27)		-0.47 (0.29)	-0.24 (0.17)	-0.25 (0.18)
Real GDP Growth, (% yoy)										0.30* (0.13)	0.31* (0.14)
Trade/GDP, %										0.49 (0.40)	0.47 (0.35)
Inflation, %											0.12 (0.36)
Observations	231	258	258	258	242	258	234	215	218	210	210
R-squared	0.23	0.19	0.19	0.19	0.19	0.19	0.22	0.25	0.23	0.27	0.27
Number of Countries	8	9	9	9	9	9	8	8	8	7	7

Notes: All regressions include time fixed effects; Clustered standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1. All explanatory variables are lagged one quarter. All variables, except dummies and number of easings/tightenings have been normalized and outliers have been removed.

Table 6: Non-Freely Floating Exchange Rate Regimes; Dependent Variable: Number of Net Easings of Outflows

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
IT Monetary Policy	0.04 (0.17)	-0.13 (0.23)	-0.12 (0.24)	-0.16 (0.18)	-0.14 (0.24)	-0.05 (0.19)	-0.12 (0.23)	0.17 (0.36)	0.30 (0.22)	0.19 (0.30)	0.04 (0.27)	0.07 (0.27)
No. of Net Tightenings of Inflow Controls	0.08 (0.06)	0.09 (0.07)	0.09 (0.07)	0.09 (0.07)	0.09 (0.07)	0.11 (0.08)	0.09 (0.07)	0.11 (0.07)	0.12 (0.08)	0.12 (0.09)	0.12 (0.09)	0.12 (0.10)
Capital Account Openness (Chinn-Ito)	-0.28 (0.32)	-0.34 (0.34)	-0.34 (0.33)	-0.34 (0.35)	-0.38 (0.32)	-0.24 (0.28)	-0.34 (0.32)	-0.36 (0.34)	-0.25 (0.36)	-0.27 (0.30)	-0.18 (0.29)	-0.19 (0.32)
<u>Fiscal Concerns</u>												
Fiscal Balance/GDP, %	0.01 (0.12)	0.03 (0.13)	0.03 (0.13)	0.01 (0.12)	0.02 (0.12)	-0.08 (0.22)	0.03 (0.13)	0.03 (0.13)	-0.14 (0.20)	-0.13 (0.20)	-0.13 (0.20)	-0.13 (0.20)
Liquidation Tax	0.23 (0.15)	0.25 (0.22)	0.23 (0.16)	0.23 (0.15)	0.23 (0.16)	0.21 (0.15)	0.23 (0.16)	0.22 (0.16)	0.23 (0.25)	0.18 (0.15)	0.22 (0.13)	0.32 (0.39)
Repression Revenues/GDP, %	-0.32 (0.26)								-0.25 (0.23)			
(Bank Lending/Total Bank Assets)*Inflation		-0.03 (0.16)							-0.11 (0.28)			
<u>NKI Concerns</u>												
Change in Stock Prices, (% yoy)	0.11 (0.07)	0.14* (0.07)	0.13** (0.06)	0.14** (0.06)	0.14** (0.06)	0.14* (0.06)	0.13** (0.06)	0.17** (0.07)	0.16* (0.08)	0.17** (0.07)	0.17 (0.10)	0.18 (0.10)
Gross Inflow Stop	-0.23** (0.10)	-0.25* (0.12)	-0.25* (0.11)	-0.17 (0.10)	-0.18 (0.11)	-0.16 (0.12)	-0.25* (0.12)	-0.38** (0.17)	-0.26* (0.13)	-0.24 (0.14)	-0.07 (0.19)	-0.07 (0.19)
Flight	-0.14 (0.14)	-0.10 (0.19)	-0.10 (0.19)	-0.04 (0.20)	-0.07 (0.19)	0.14 (0.19)	-0.10 (0.19)	-0.14 (0.17)	-0.04 (0.11)	0.06 (0.17)	0.07 (0.12)	0.07 (0.12)
REER Volatility	0.25* (0.13)	0.18 (0.11)	0.18 (0.11)	0.22* (0.10)	0.18 (0.11)	0.17* (0.09)	0.18 (0.11)	0.19 (0.11)	0.28* (0.15)	0.21* (0.11)	0.12 (0.11)	0.12 (0.10)
NKI Volatility	-0.56** (0.24)	-0.43* (0.22)	-0.42* (0.22)	-0.45* (0.23)	-0.42* (0.21)	-0.43* (0.22)	-0.42* (0.22)	-0.30 (0.25)	-0.50* (0.25)	-0.40 (0.23)	-0.50* (0.25)	-0.50* (0.25)
NKI/GDP, %				0.20** (0.09)					0.18 (0.18)	0.19 (0.17)	0.09 (0.16)	0.08 (0.16)
EMP					-0.09 (0.05)				-0.06 (0.05)	-0.05 (0.05)	-0.06 (0.04)	-0.06 (0.04)
Δ (Reserves/GDP, %)						0.11 (0.10)			-0.05 (0.14)	-0.03 (0.13)	0.01 (0.13)	0.01 (0.13)
REER Appreciation							0.00 (0.07)		-0.03 (0.07)	-0.04 (0.08)	0.00 (0.08)	0.01 (0.08)
(Short Term External Debt-Reserves)/GDP, %								-0.52** (0.23)	-0.44* (0.20)	-0.41* (0.20)	-0.21 (0.24)	-0.22 (0.23)
Real GDP Growth, (% yoy)											0.18 (0.13)	0.18 (0.13)
Trade/GDP, %											0.60 (0.54)	0.65 (0.61)
Inflation, %												-0.10 (0.33)
Observations	251	254	254	254	254	238	254	254	235	238	230	230
R-squared	0.21	0.19	0.19	0.20	0.19	0.19	0.19	0.20	0.22	0.21	0.24	0.24
Number of Countries	13	13	13	13	13	13	13	13	13	13	12	12

Notes: All regressions include time fixed effects; Clustered standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1. All explanatory variables are lagged one quarter. All variables, except dummies and number of easings/tightenings have been normalized and outliers have been removed.

Table 7: IT Monetary Policy Regimes; Dependent Variable: Number of Net Easings of Outflows

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Free Floating Exchange Rate Regime	-0.14 (0.16)	-0.07 (0.16)	-0.06 (0.17)	-0.07 (0.17)	-0.05 (0.17)	-0.07 (0.16)	-0.03 (0.16)	-0.13 (0.16)	-0.05 (0.17)	-0.07 (0.19)	-0.10 (0.19)
No. of Net Tightenings of Inflow Controls	-0.06 (0.09)	-0.07 (0.08)	-0.07 (0.08)	-0.07 (0.08)	-0.06 (0.07)	-0.08 (0.08)	-0.06 (0.10)	-0.08 (0.09)	-0.07 (0.09)	-0.08 (0.09)	-0.08 (0.09)
Capital Account Openness (Chinn-Ito)	-0.38** (0.14)	-0.40** (0.16)	-0.41** (0.16)	-0.42** (0.15)	-0.49*** (0.15)	-0.47*** (0.14)	-0.26 (0.15)	-0.45** (0.16)	-0.37** (0.14)	-0.38** (0.15)	-0.38** (0.14)
Fiscal Concerns											
Fiscal Balance/GDP, %	0.18* (0.08)	0.19** (0.07)	0.19** (0.07)	0.19** (0.07)	0.17** (0.07)	0.19** (0.07)	0.17* (0.08)	0.16* (0.09)	0.15 (0.08)	0.15 (0.08)	0.15 (0.08)
Liquidation Tax	0.05 (0.14)	0.01 (0.13)	0.05 (0.14)	0.05 (0.14)	0.06 (0.13)	0.05 (0.13)	0.10 (0.13)	0.02 (0.10)	0.08 (0.11)	0.10 (0.10)	-0.06 (0.16)
Repression Revenues/GDP, %	-0.14 (0.10)							-0.06 (0.13)			
(Bank Lending/Total Bank Assets)*Inflation		0.13 (0.17)						0.01 (0.17)			
NKI Concerns											
Change in Stock Prices, (% yoy)	0.11* (0.06)	0.11** (0.04)	0.11** (0.04)	0.11** (0.04)	0.13*** (0.04)	0.11*** (0.03)	0.12** (0.04)	0.12** (0.05)	0.13*** (0.04)	0.14** (0.05)	0.14** (0.05)
Gross Inflow Stop	-0.19 (0.11)	-0.21 (0.11)	-0.19 (0.12)	-0.18 (0.13)	-0.25* (0.12)	-0.23 (0.14)	-0.20* (0.11)	-0.22 (0.15)	-0.25 (0.14)	-0.15 (0.15)	-0.16 (0.15)
Flight	-0.04 (0.10)	-0.01 (0.11)	-0.01 (0.10)	-0.02 (0.11)	-0.07 (0.12)	-0.01 (0.12)	-0.02 (0.10)	-0.05 (0.12)	-0.04 (0.11)	-0.01 (0.13)	0.00 (0.14)
REER Volatility	-0.11 (0.11)	-0.11 (0.12)	-0.10 (0.12)	-0.11 (0.11)	-0.08 (0.14)	-0.18** (0.08)	-0.04 (0.09)	-0.19* (0.09)	-0.13 (0.08)	-0.13 (0.08)	-0.12 (0.08)
NKI Volatility	-0.24 (0.16)	-0.43** (0.17)	-0.45** (0.18)	-0.45** (0.17)	-0.43** (0.18)	-0.43** (0.16)	-0.40*** (0.12)	-0.29* (0.15)	-0.39*** (0.11)	-0.42*** (0.12)	-0.35** (0.15)
NKI/GDP, %			0.01 (0.09)					0.03 (0.09)	-0.01 (0.09)	-0.02 (0.09)	-0.02 (0.08)
EMP				-0.09 (0.08)				-0.13** (0.05)	-0.13** (0.04)	-0.12** (0.04)	-0.11** (0.04)
Δ (Reserves/GDP, %)					-0.14 (0.13)			-0.08 (0.15)	-0.10 (0.14)	-0.08 (0.14)	-0.07 (0.14)
REER Appreciation						0.10 (0.06)		0.08 (0.06)	0.08 (0.05)	0.09 (0.06)	0.09 (0.06)
(Short Term External Debt-Reserves)/GDP, %							-0.40** (0.14)		-0.37*** (0.11)	-0.36*** (0.11)	-0.31** (0.11)
Real GDP Growth, (% yoy)										0.12 (0.12)	0.13 (0.12)
Trade/GDP, %										-0.13 (0.22)	-0.23 (0.23)
Inflation, %											0.20
(External Debt-Reserves)/GDP, %											
Observations	293	317	317	317	317	317	293	293	293	293	293
R-squared	0.26	0.23	0.23	0.24	0.24	0.24	0.27	0.28	0.29	0.30	0.30
Number of Countries	10	11	11	11	11	11	10	10	10	10	10

Notes: All regressions include time fixed effects; Clustered standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1. All explanatory variables are lagged one quarter. All variables, except dummies and number of easings/tightenings have been normalized and outliers have been removed.

Table 8: Non-IT Monetary Policy Regimes; Dependent Variable: Number of Net Easings of Outflows

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Free Floating Exchange Rate Regime	-0.46 (0.34)	-0.32 (0.47)	-0.40 (0.28)	-0.30 (0.53)	-1.69 (1.07)	-1.01 (0.77)	-0.80 (0.43)	-0.43 (0.52)	-2.06 (1.41)	-1.67 (1.27)	-2.05 (1.37)	-2.65 (1.53)
No. of Net Tightenings of Inflow Controls	0.17 (0.13)	0.19 (0.16)	0.19 (0.15)	0.19 (0.16)	0.24 (0.18)	0.20 (0.17)	0.22 (0.16)	0.20 (0.17)	0.24 (0.18)	0.21 (0.17)	0.24 (0.19)	0.27 (0.19)
Capital Account Openness (Chinn-Ito)	-0.76 (0.53)	-0.67 (0.68)	-0.65 (0.57)	-0.70 (0.60)	-0.39 (0.51)	-0.69 (0.63)	-0.87 (0.68)	-0.83 (0.61)	-0.79 (0.63)	-1.09* (0.54)	-0.47 (0.40)	-0.35 (0.38)
Fiscal Concerns												
Fiscal Balance/GDP, %	0.05* (0.03)	0.13* (0.07)	0.11 (0.07)	0.13 (0.07)	-0.06 (0.24)	0.16** (0.05)	0.13* (0.06)	0.12 (0.07)	-0.13 (0.19)	-0.17 (0.18)	-0.03 (0.22)	-0.07 (0.20)
Liquidation Tax	0.46*** (0.10)	0.35 (0.34)	0.38 (0.29)	0.39 (0.31)	0.02 (0.19)	0.47 (0.29)	0.35 (0.28)	0.34 (0.26)	0.70* (0.29)	1.31** (0.46)	0.11 (0.24)	1.09 (0.96)
Repression Revenues/GDP, %	-0.41 (0.31)								-0.22 (0.26)	-0.25 (0.23)		
(Bank Lending/Total Bank Assets)*Inflation		0.07 (0.25)							-0.64 (0.34)	-1.51* (0.65)		
NKI Concerns												
Change in Stock Prices, (% yoy)	0.04 (0.22)	0.16 (0.23)	0.14 (0.20)	0.17 (0.25)	0.14 (0.18)	0.19 (0.21)	0.18 (0.26)	0.22 (0.24)	0.04 (0.24)	0.10 (0.21)	0.16 (0.22)	0.01 (0.35)
Gross Inflow Stop	-0.11 (0.32)	-0.28 (0.26)	-0.27 (0.19)	-0.28 (0.35)	0.03 (0.21)	-0.31 (0.24)	-0.71* (0.36)	-0.60* (0.28)	-0.32 (0.85)	-0.47 (0.41)	-0.24 (0.37)	-0.38 (0.85)
Flight	-0.19 (0.17)	-0.02 (0.28)	0.01 (0.27)	-0.02 (0.27)	0.15 (0.40)	-0.05 (0.28)	-0.06 (0.27)	-0.11 (0.29)	-0.32 (0.18)	-0.57** (0.20)	0.03 (0.45)	-0.04 (0.18)
REER Volatility	0.36* (0.16)	0.22 (0.17)	0.30** (0.12)	0.22 (0.17)	0.28* (0.13)	0.27 (0.18)	0.26 (0.17)	0.51** (0.19)	0.42 (0.22)	0.80** (0.26)	0.48* (0.22)	0.39 (0.22)
NKI Volatility	-0.70** (0.27)	-0.44 (0.45)	-0.62 (0.41)	-0.45 (0.47)	-0.21 (0.40)	-0.49 (0.45)	-0.27 (0.53)	-0.24 (0.49)	-0.48 (0.43)	-0.42 (0.40)	-0.21 (0.49)	-0.67 (0.65)
NKI/GDP, %			0.25* (0.11)						-0.13 (0.28)	-0.37 (0.30)	0.04 (0.20)	-0.06 (0.33)
EMP				-0.02 (0.14)					-0.01 (0.20)	-0.05 (0.19)	0.05 (0.16)	-0.00 (0.16)
Δ (Reserves/GDP, %)					0.26*** (0.07)				0.16 (0.13)	0.23* (0.10)	0.21* (0.10)	0.17 (0.17)
REER Appreciation						-0.20 (0.13)			-0.14 (0.14)	-0.11 (0.13)	-0.14 (0.09)	-0.09 (0.12)
(Short Term External Debt-Reserves)/GDP, %							-0.59 (0.33)		-0.44 (0.54)			
Real GDP Growth, (% yoy)												0.21 (0.24)
Trade/GDP, %												1.80 (1.20)
Inflation, %												-0.94 (1.00)
(External Debt-Reserves)/GDP, %								-0.71* (0.32)		-0.95** (0.38)	-0.39* (0.19)	-0.35 (0.19)
Observations	136	139	139	139	123	139	139	139	120	120	123	115
R-squared	0.35	0.31	0.32	0.31	0.35	0.31	0.32	0.33	0.39	0.40	0.36	0.41
Number of Countries	7	7	7	7	7	7	7	7	7	7	7	6

Notes: All regressions include time fixed effects; Clustered standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1. All explanatory variables are lagged one quarter. All variables, except dummies and number of easings/tightenings have been normalized and outliers have been removed.

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).¹⁹ For the purpose of this paper, the ‘other’ measures are classified as both outflows and inflow 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:

¹⁹ 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 External Repression Revenues

Table A.1: Repression Revenues computations and formulas

#	Variable	Descriptions and Source	Frequency
1	Total interest on external public and publicly guaranteed (PPG) debt from private creditors	Interest payments on external PPG debt from private creditors + change in interest arrears to private creditors, in USD amounts. Several adjustments are made, in addition: 1. WDI debt statistics on interest arrears are available only for total interest arrears on PPG debt (i.e. not interest arrears on PPG debt from private creditors) and total interest arrears from official creditors. Under the assumption that all official creditor arrears are on PPG debt, we first compute interest arrears on PPG debt from private creditors as the difference between total interest arrears on PPG debt and interest arrears on debt from official creditors. 2. The change in arrears are then adjusted for interest forgiveness as part of sovereign commercial restructurings. Now, again, interest rescheduled and forgiven is available only for all external debt (not just PPG debt). Therefore, we took the dates of sovereign commercial restructurings from Das et. al. (2012) and added back to the change in interest arrears, the interest rescheduled or forgiven only for years in which there was a sovereign restructuring with private creditors. 3. 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 Millennium 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

Table A.1 (contd.): Repression Revenues computations and formulas

#	Variable	Descriptions and Source	Frequency
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	These are also adjusted for debt forgiveness, as in #1. Source: World Bank WDI	Annual
8	USD 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: $(\#2(t)-\#2(t-1) - \#7)*100/\#2(t-1)$	Annual
9	Effective interest rate on external debt, including debt revaluation costs	This measure uses the Giovannini and de Melo formula exactly: $\#3 + \#5 + \#8$	Annual
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	Total domestic debt outstanding (excluding debt held by monetary authorities)	#12 less debt held by monetary authorities, which is IFS series FASAG or 12A.	Annual/ Quarterly
13	Domestic interest rate	$\#10/(\#11(t)+\#11(t-1)/2)$, expressed as % pa	Annual/ Quarterly
14	Repression revenue (or external repression revenue)	(Effective external interest rate - domestic interest rate)*domestic debt outstanding (excluding debt held by monetary authorities). i.e. $(\#6-\#13)*12$	Annual/ Quarterly
15	Repression revenue (including debt revaluation costs)	$(\#9-\#13)*\#12$	Annual/ Quarterly
Components of Repression Revenues:			
16a	a. Interest Differential	External interest rate (in USD terms) - domestic interest rate, i.e. $\#3-\#12$, expressed as % per annum. To compute as % of GDP, the interest differential is multiplied by #12 and divided by nominal GDP.	Annual/ Quarterly
16b	b. FX Rate Component	External interest rate*Depreciation of exchange rate, i.e. $\#3*\#5*.01$, % pa. To compute as % of GDP, the FX rate component is multiplied by #12 and divided by nominal GDP.	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 $i_t / (0.5 * (\text{Series \#2}) \text{Gross domestic debt outstanding}_t + 0.5 * (\text{Series \#2}) \text{Gross domestic debt outstanding}_{t-1})$			
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			
	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 subsequent 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/Tax Revenues, %	656	-138.33	94.98	-10.86	-13.36	31.54
Gross Govt. Debt/Tax Revenues, %	656	69.25	2817.58	879.11	980.76	610.38
Repression Revenues/GDP, %	501	-5.56	7.64	-0.14	-0.19	1.49
Repression Revenues (incl. debt revaluation costs)/GDP, %	501	-35.38	34.94	-0.23	-0.2	6.05
Liquidation Tax	528	-12.31	25.52	-2.68	-1.97	4.36
Real Deposit Rate	707	-15.75	14.47	1.04	1.09	4.15
(Bank Lending to Govt./Total Banking Sector Assets)*Inflation	707	-13.85	36.2	0.95	1.75	3.47
Overheating Concerns						
Domestic Credit Gap	679	-32.14	31.24	-0.49	-0.02	6.17
Domestic Credit/GDP Growth, (% yoy)	659	0.06	0.12	0.08	0.08	0.01
Inflation, %	707	-2.79	47.04	4.39	5.7	4.96
Real GDP Growth, (% yoy)	695	-14.74	16.09	5.31	5.13	3.72
Current Account Balance/GDP, %	596	-7.23	19.47	0.56	1.53	4.6
NKI/GDP, %	675	-26.12	12.62	1.54	1.06	3.98
FX Valuation Concerns						
Δ (Reserves/GDP, %)	679	-9.43	14.24	0.26	0.64	2.78
Exchange Market Pressure (EMP)	707	-0.73	0.93	-0.05	-0.06	0.14
Change in REER, (% yoy)	667	-31.35	37.33	1.01	1.53	9.23
REER Deviation from Trend, %	667	-46.15	34.56	0.35	0.74	12.57
PPP based Undervaluation	747	-0.52	0.86	0.16	0.18	0.27
Macroeconomic Stability						
REAL GDP Growth Volatility	697	0.01	10.64	1.94	2.52	1.9
REER Volatility	667	1.76	40.49	6.14	7.8	5.86
Equity Returns Volatility	747	0.62	93.18	11.32	15.66	13.73
NKI Volatility	739	0	159.56	5.59	11.01	17.94
Gross Inflows Volatility	707	0.44	127.08	6.88	13.02	18.46
Gross Outflows Volatility	701	0.02	109.74	4.73	8.5	12.51
Financial Stability						
Change in Stock Prices, (% yoy)	747	-84.84	388.22	16.89	20.84	44.43
(External Debt-Reserves)/GDP, %	665	-39.18	121.51	14.33	16.32	23.11
(Short Term External Debt-Reserves)/GDP, %	625	-44.89	7.41	-8.78	-11.55	11.45
Others						
Capital Account Openness (Quinn Index)	707	12.5	100	50	60.87	23.58
Capital Account Openness (Chinn-Ito)	707	-1.86	2.46	-0.11	0.12	1.22
No. of Net Tightenings of Inflow Controls	747	-11	12	0	-0.12	1.19
Trade/GDP, %	669	19.94	348.34	56.89	72.82	45.71

Table A.5: Data Sources for Explanatory Variables.

Variable	Definition/Source
Fiscal concerns:	
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.
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 debt 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.
Domestic Credit Gap, %	Domestic Credit/GDP divided by its 3-year lagged moving average
Inflation (% yoy)	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.
NKI surge	Dummy for surge in 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. Surge episodes satisfy three criteria: (1) current year-over-year changes in four-quarter NKI is more than two standard deviations above the historic

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

Variable	Definition/Source
	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 above the historical average; and (3) the length of the episode is greater than one quarter. NKI data are from IFS.
<p>FX Valuation Concerns: Δ (Reserves/GDP, %) (or Change in Reserves/GDP (yoy))</p>	year-on year change in 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.
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, %	Difference between the log of PPP real exchange rate and its predicted value. Following Rodrick (2008) a currency is classified as undervalued if its PPP real exchange rate is higher than 1 after taking into account the Balassa-Samuelson effect. Two series were used to compute this series. PPP real exchange rate is the Purchasing Power Parity over GDP in national currency units per US dollar. GDP per capita is PPP converted GDP per capita at 2005 constant prices (International dollar per person). Both series are obtained from Penn World Table 7.0. Data for all available countries and periods was used to compute PPP based undervaluation.
<p>Macroeconomic Stability: Volatility of Real GDP Growth</p>	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 Datastream.
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).

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

Variable	Definition/Source
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:	
(External Debt – Reserves)/GDP, %	Gross external debt is from QEDS and WDI databases of World Bank. Reserves are foreign reserves less gold and are from IFS, as is nominal GDP.
(Short Term External Debt – Reserves)/GDP, %	Short term external debt is from QEDS and WDI databases of World Bank. Reserves are foreign reserves less gold and are from IFS, as is nominal GDP.
Banking Crisis	Reinhart and Rogoff (2011)
Inflation Crisis	Annual inflation above 20 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.
Other Variables:	
Capital Account Openness (Quinn)	Higher values indicate greater de-jure capital account openness. Source: Quinn (1997) and Quinn and Toyoda (2008)
Capital Account Openness (Chinn-Ito)	Higher values indicate greater de-jure capital account openness. Source: Chinn and Ito (2010)
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.
Net Easings of Inflows	Number of net easings of inflow 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.