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THE EFFECTIVENESS OF CAPITAL CONTROLS

by Valerio Nispi Landi and Alessandro Schiavone[*]

Abstract

The goal of this work is a systematic analysis of the effectiveness of capital controls in reducing the volume of capital flows and the probability of extreme events (surges and flights), strengthening financial stability and affecting the exchange rate. We find that controls significantly reduce capital flows, even though the effectiveness varies across economies and types of investment. Moreover capital controls tend to reduce the probability of extreme episodes. With regard to financial stability objectives, controls on banking inflows reduce domestic credit growth, but this effect is mainly driven by advanced economies. Controls on capital inflows reduce the share of domestic loans denominated in foreign currency. Finally, our estimates suggest that capital controls on inflows tend to be associated with an undervalued exchange rate only in emerging market economies.

JEL Classification: F21, F32, G11.
Keywords: international capital flows, capital controls, prudential tools.

Contents

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1 Introduction[1]

The goal of this work is a systematic analysis of the effectiveness of capital controls in reducing the volume and the volatility of capital flows, strengthening financial stability and affecting the exchange rate.

The attitudes of both economists and policymakers toward capital controls tend to swing between extreme positions following a pattern that reflects the changing implications of capital flows over the financial cycle. From a political economy perspective, the liberalization of capital flows is likely to be encouraged when the economy recovers after a crisis. However, as growth gains traction, capital inflows may become undesirably large, causing the domestic currency to appreciate and fueling asset prices, which end up raising support for re-introducing capital controls.

Historically, capital controls had been pervasive during the Bretton Woods era, and were progressively dismantled since the late 70s. Then, the Asian crisis prompted an overhaul of the received wisdom and economists such as Rodrik (1998) and Krugman (1999) contributed to reopen the debate on the usefulness of capital controls. More recently, the Global Financial Crisis has fueled once again the debate, highlighting the risks associated with large and volatile flows: since 2007 many countries have been restricting their financial account, also supported by well-known academics (e.g. Rey, 2015).

There is an intense dialogue also among international institutions about the merits of capital controls. The IMF Institutional View (IMF, 2012) states that capital flow management measures (CFMs)[2] are a part of the toolkit and their use is appropriate under certain conditions, even if they should not substitute for warranted macroeconomic adjustment. More recently, the IMF has argued that the use of CFMs after 2009 has been broadly in line with the Institutional View. Similarly, a joint policy paper by the IMF, the FSB and the BIS promotes an holistic approach on financial stability encompassing capital flows management and macroprudential measures (IMF-FSB-BIS, 2016). On the other hand, according to the OECD, which is the only international body having jurisdiction on capital movements,[3] CFMs should be seen as last resort policy and their use should be strictly regulated; according to the OECD their economic costs tend to overcome the benefits in terms of financial stability (see Caldera Sánchez and Gori, 2016).

[1]We are especially grateful to Pietro Catte, Riccardo Cristadoro, Francesco Paternò and seminar participants of REI internal workshop and Villa Mondragone International Economic Seminar. All remaining errors are ours. The views expressed in this paper are our own and do not necessarily reflect those of the Bank of Italy.

[2]We refer to CFMs as those policy tools which include both capital controls and currency-based measures. When we refer to capital controls, we mean only those restrictions to the financial account discriminating between residents and non-residents.

[3]The OECD jurisdiction on capital movement is restricted to the countries which have subscribed the "OECD Code of liberalization of capital movements".

Even though the political debate on CFMs tends to consider them as a single class of instruments, in this paper we focus only on capital controls, for which data are available for a large sample of countries and over an extended period of time. The capital controls indicators used in this analysis are elaborated from the dataset developed by Fernández et al. (2016), which is based on the IMF's Annual Report on the Exchange Arrangements and Exchange Restrictions (AREAER). This dataset has the clear advantage of reporting capital controls indicators specific on several asset categories, distinguishing the restrictions on domestic investors from those on foreign investors. This allows us to look at the effects of capital controls separately on inflows and outflows. Notably, following the classification of the Balance of Payments Manual (BPM6), in this paper capital flows refer to cross-border financial transactions recorded in the financial account; hence, for a given economy, inflows represent changes in the country's gross external liabilities, while outflows relate to changes in the country's gross external assets.[4] Consequently, we consider as capital controls on inflows the restrictions on foreign investors and as capital controls on outflows the restrictions on domestic investors. The dataset on capital controls covers almost 20 years of data for a large set of economies, including both emerging (EMEs, henceforth) and advanced (AEs henceforth), allowing us to analyze potential heterogeneity in capital controls' effectiveness.

The set of policy objectives that can potentially be achieved through the use of capital controls is very broad. This point is clearly revealed by the empirical surveys that have investigated the motivations for capital controls. Pasricha (2017) finds that capital controls policy in 21 EMEs responds to both macroprudential and mercantilist motivations; this outcome suggests that capital controls may be used not only to underpin financial stability but also to preserve competitive advantage in trade. Fratzscher (2012) finds that capital controls in a broad set of 79 economies (both emerging and advanced), over the period 1984-2009, are motivated by concern for the overheating of the domestic economy, in the form of high credit growth, rising inflation and output volatility; however, in many cases capital controls are associated with significantly undervalued exchange rates. Another interesting result is that countries with shallow financial markets tend to use relatively more capital controls, presumably to protect their economies against the disruptive effects of large and volatile capital flows. Given the multitude of motivations of capital controls, our analysis looks at the impact of capital controls on capital inflows and outflows and on a broad set of economic and financial variables, including domestic credit growth, exchange rate misalignments and the share of domestic loans denominated in foreign currency.

[4]In particular, gross capital inflows represent the difference between investment and disinvestment in domestic assets by non-residents, while gross outflows are the difference between investment and disinvestment in foreign assets by residents.

Our results point to two main conclusions: (a) capital controls are generally effective; (b) the effectiveness and, more generally, the impact of capital controls on our variables of interest is differentiated for AEs and EMEs. More specifically, capital controls turn out to be effective in reducing capital inflows both in AEs and EMEs. In EMEs this effectiveness is driven mostly by the ability of capital controls to condition FDI and portfolio investments, while in AEs it is driven mainly by the capital controls' ability to affect "other investments", a residual category that includes mainly banking flows. Notably, capital controls on inflows reduce the probability of a capital surge and the result is mainly driven by AEs. Restrictions on capital outflows are effective in the entire sample and the effect is mainly driven by AEs. Moreover, controls on capital outflows reduce the probability of a capital flight both in AEs and EMEs. With regard to financial stability objectives, controls on other investment inflows reduce domestic credit growth but the effect is mainly driven by AEs. Furthermore, controls on capital inflows reduce the share of domestic loans denominated in foreign currency. Finally, our estimates suggest that capital controls on inflows are associated with undervalued exchange rates in EMEs but not in AEs.

The work is organized as follows. Section 2 reviews the literature. In section 3 we describe the capital controls indicators used in the empirical model, which is illustrated in section 4. In section 5 we show the results of our baseline specification and we perform some robustness checks to understand which groups of countries tend to drive the results. Section 6 concludes.

2 Related literature

The literature assessing the effectiveness of capital controls in cross-country studies[5] is rapidly growing and features mixed results. This literature mainly focuses on two issues: a first stream of the literature focuses on the impact of these policy tools on the volume and the composition of capital flows: if capital controls were not able to affect capital flows, they would be unlikely to influence other key variables. A second stream of the literature examines the role of capital controls with regard to several goals, such as financial stability, monetary policy independence from global factors, exchange rate targeting. Magud et al. (2011) conduct a review of the empirical studies belonging to the two streams circulated before 2010 and survey the results of a large number of works. They argue that cross-country studies tend to find no effect on the volume of

[5]For country-case studies, the volume edited by Edwards (2009) includes excellent analysis of the experience of several EMEs during '90s and early 2000s. See Vithessonthi and Tongurai (2013) and Chamon and Garcia (2016) for more recent case-studies of the effectiveness of capital controls, in Thailand and Brazil respectively.

capital flows, while some studies on individual countries (e.g. Malaysia, Chile in the '90s) provide evidence of the effectiveness of capital controls. There is more evidence about their impact on the composition of capital flows (i.e. lengthening the maturity), even though the effects prove transitory. The main policy implication is that capital controls do not constitute a one-size-fits-all tool and their usefulness depends both on the objective and the degree of liberalization. In what follows, we separately describe the two streams of the literature, focusing on works subsequent to those reviewed by Magud et al. (2011).

The first group of papers uses, in most cases, panel estimation where the dependent variable is some measure of capital flows and the regressor of interest is a capital control index, typically derived from the AREAER. Binici et al. (2010) find that both controls on debt and on equity portfolio flows can reduce outflows, but only in AEs, while the effect on capital inflows is not significantly different from zero. Ostry et al. (2012) find some evidence of capital controls effectiveness in shifting the composition of capital inflows from banking and portfolio debt flows to portfolio equity and FDI flows in 51 EMEs; moreover, their results suggest that capital controls are associated with a lower proportion of foreign-currency loans in domestic bank lending. Bruno et al. (2017) conduct a panel regression on quarterly data for a sample of 12 Asia-Pacific economies during the period 2004-2013 to assess the impact of CFMs on capital flows (both banking and bond inflows) and domestic credit, after controlling for global and local factors. Notably, they find that CFMs are effective in dampening bond and banking inflows; in addition, capital controls targeting specific asset classes tend to cause substitution effects prompting an increase of inflows in other asset classes. In a sample of EMEs and AEs, Beirne and Friedrich (2017) show that the effectiveness of CFMs depends on the structure of the banking sector. Forbes and Warnock (2012) attempt to identify which factors are associated to extreme capital flows episodes, by using a probit regression for over 50 EMEs in the period 1980-2009; capital controls are not significantly related to any type of extreme capital flow episodes. Dell'Erba and Reinhardt (2015) show that restrictions on money market instruments tend to decrease the likelihood of a surge in banking flows in EMEs, but increase the probability of financial FDI surges, suggesting that the two types of flows are substitutes in the face of restrictions. Among the papers that adopt different econometric strategies, Baba and Kokenyne (2011) estimate the effectiveness of capital controls in response to capital inflow surges in 4 countries (Brazil, Colombia, Korea, and Thailand) in the 2000s using both a GMM model and VAR system. They use monthly data for capital flows by specific asset type (FDIs, stocks, bonds, money market instruments, etc.) and a price-based measure of capital inflow controls. Controls are generally associated with a decrease in inflows and a lengthening of maturities, but the relationship is not statistically significant in all cases and the effects are temporary. Habermeier et al. (2011), attempt to assess the

effectiveness of CFMs in 13 EMEs, using the same methodology adopted in Baba and Kokenyne (2011). They find that the effect of CFMs on the volume of capital inflows is not significant. Forbes et al. (2015) use a propensity-score matching methodology with weekly data and find no significant effect of capital controls on portfolio flows and other macroeconomic and financial variables in a sample of 60 EMEs.

The second group of papers includes empirical studies of the effects of capital controls on financial and monetary indicators, which show up as dependent variables in panel regressions. In some cases, the second group overlaps with the first one: for instance, Ostry et al. (2012) do not find any significant association between capital controls and domestic credit; on the contrary, Forbes et al. (2015) show evidence of a negative impact of capital controls on domestic credit growth, while the effect on the nominal exchange rate is significant only upon removal of controls on capital outflows. In a sample of AEs and EMEs, Hoggarth et al. (2016) find that capital inflows in financially open countries are more sensitive to global volatility, implying that capital controls reduce a country's sensitivity to push factors. Ostry et al. (2010) investigate whether capital controls affect the likelihood of a crisis in EMEs; by estimating a probit regression they conclude that countries having adopted capital controls, especially on debt inflows, were less exposed to the global financial crisis. This argument is challenged by Blundell-Wignall and Roulet (2014), who show that Ostry et al. (2010)'s results are not robust, being highly sensitive to the sample composition. Using an alternative panel regression on the same data, they show, on the one hand, that lower capital controls were associated with better growth outcomes during the crisis; on the other hand, before the global financial crisis, capital controls helped EMEs to maintain undervalued currencies, and therefore to benefit from larger net exports and, as a consequence, higher growth rates. Cerutti et al. (2014) claim that CFMs help to reduce exposure to large variations in global liquidity. They estimate a panel regression on 77 AEs and EMEs in the period 1990-2012 to study the impact of global and local factors on cross-border banking flows; they find that these flows are driven primarily by uncertainty (proxied by the VIX), the level of interest rates and the slope of the yield curve in major economies, as well as the leverage of systemic financial institutions; in order to account for capital account policies, they use composite measures of financial regulation drawn from Quinn et al. (2011), based upon the qualitative information contained into the AREAER; interestingly, they find that an increase from the 25th to 75th percentile in this financial regulation index reduces the impact of global factors on cross-border banking flows approximately by half.

The different results found in the literature are likely due to the estimation samples (country coverage and time horizon), the type of capital controls indexes used and the different econometric methodologies. Accordingly, in this paper we use quite a large

estimation sample (65 countries, 18 years), an index of capital controls which captures several types of restrictions and a standard methodology (pooled OLS). Moreover, by repeating the analysis on sub-samples (AEs vs EMEs, open vs closed economies), we assess in which kind of countries capital controls are more effective.

3 Capital controls indicators: descriptive evidence

3.1 Restrictions on financial transactions

Assessing the effectiveness of capital controls requires using appropriate indicators. Unfortunately, capital controls are difficult to quantify. For cross-country studies, there are two main types of indicators: i) de jure indicators capture the existence of regulatory measures affecting capital movements; ii) de facto indicators, based on economic variables, tend to reflect the degree of financial integration at the country level. Since the scope of this paper is to examine the effects of capital controls on various economic variables, our analysis is carried out using de-jure indicators.

Most of these indicators draw on the IMF's AREAER database, which provides information on restrictions applied to specific transactions recorded in the balance of payments. A typical drawback of the aggregate indicators of capital openness (e.g. the Chinn and Ito index, CI henceforth) is their lack of granularity, which does not allow to analyze the effects of capital controls on specific transactions. In our paper we use the dataset released by Fernández et al. (2016) (FKR, henceforth), built on the methodology elaborated by Schindler (2009), which distinguishes restrictions across 10 different types of transactions, taking into account the residency of investors to whom restrictions are applied. We consider as inflows the changes in gross external liabilities of the country and as outflows the changes in foreign assets held by domestic investors; therefore, in this paper controls on capital inflows refer to restrictions applied to foreign investors while controls on capital outflows refer to restrictions on domestic investors.[6]

The restrictions considered in this dataset include a large set of capital controls such as authorizations, approval, permission, clearances, quantity restrictions, deposit requirements, and taxes differentiated on the basis of the investors' residency.[7] The main advan-

[6]As regards portfolio flows, the FKR dataset distinguishes also between restrictions on purchases by residents (or non-residents) from those on sales by residents (or non-residents). This distinction in theory would allow to look at the impact of capital controls on gross sales of domestic financial instruments to foreign residents and gross purchases of foreign financial instruments by domestic residents. However, this analysis is not feasible, since the Balance of Payments database provides data only on net purchases by foreigners of domestic financial instruments and net sales by domestic investors of foreign financial instruments (see footnote 4).

[7]The index does not consider requirements related to reporting, registration, notification procedures as well as restrictions on specific economic sectors/countries and/or for political/national security reasons.

tage of this dataset is the possibility to construct measures of capital controls targeted to specific flows. The dataset includes 100 countries, of which 31 AEs and 69 EMEs[8] over the period 1995-2015. In what follows, we describe the capital controls indicators for the full set of countries. However, in the estimation sample described in the next section, we drop some countries with specific characteristics.

One common limitation of de-jure indicators is that they fail to account for the intensity of capital controls. The indicators count the number of transactions that are restricted, providing a gauge about the extension of capital controls in a given economy.

Using FKR allows us to construct indicators strictly related to transactions recorded in the financial account of the balance of payments; this represents another advantage in comparison with aggregate indicators, such as CI, that reflect also restrictions on current account transactions, such as requirements for the repatriation and surrender of export proceeds. FKR contains dummy variables along two main dimensions: the type of transactions and the residency status of investors. The dummies take the value of one if there is a restriction in place and zero otherwise. We take advantage of granular information in FKR to construct specific indicators for the three broad types of transactions recorded in the financial account of the balance of payments (FDIs, portfolio and other investment). For each type of investment flow, for each country, in each year, we take the simple average of the dummy variables separately for capital inflows and outflows (table A.1). Accordingly, we obtain six capital controls indicators, three for inflows and three for outflows. For each country i and year t, capital control indicators are indicated with $KK_{it}^{c,d}$, where $c = \{fdi, ptf, other\}$ denotes the asset category and $d = \{in, out\}$ denotes the direction which refers to the residency status of investors (foreign and domestic, respectively)

The control index on FDIs (inflows/outflows) is the average of two dummy variables; the first accounts for the presence of any kind of restrictions between entities with participation linkages, while the second refers to restrictions applied to the phase of the liquidation of the investment. The corresponding index for portfolio investments (inflows/outflows) is the average of the indicators referring to specific instruments (bonds, equities, collective investments).[9] The index for the other investments (inflows/outflows) is computed as the average of three dummy variables: financial credit, commercial credit and guarantees indices[10] (table A.1).

Moreover, we compute an aggregate direction-specific index of controls on capital

[8]In EMEs we include also low-income countries.

[9]The indicators on bonds, equities, collective investments inflows (outflows) are obtained as the average of specific restrictions on purchases and sales by non-residents (residents). We associate restrictions on non-residents (residents) to inflows (outflows). See Schindler (2009) on the relationship between the direction of flows and the residency status of investors.

[10]The item other "investments" in the balance of payments, includes mainly banking flows, as well as trade credit, other accounts receivable/payable, insurance and guarantee schemes.

inflows and outflows taking a simple average of the three capital controls indicators computed above:[11]

$$\begin{aligned} KK_{it}^{tot,in} &= \frac{1}{3}\sum_{c} KK_{it}^{c,in} \\ KK_{it}^{tot,out} &= \frac{1}{3}\sum_{c} KK_{it}^{c,out}. \end{aligned}$$

Finally, we compute an aggregate indicator of capital controls by taking the simple average of $KK_{it}^{tot,in}$ and $KK_{it}^{tot,out}$:

$$KK_{it}^{tot} = \frac{1}{2}\left(KK_{it}^{tot,in} + KK_{it}^{tot,out}\right).$$

3.2 Evidence on capital controls from aggregate indicators

In this section we use the indicators described above to illustrate some stylized facts about the use of capital controls. First of all, we notice a strong heterogeneity across countries both in terms of the level of capital controls and in terms of the strategies adopted over the last two decades. In particular, some countries (e.g. Russia, Chile and Korea) stand out as having loosened capital controls, while others like Iceland and Argentina have restricted their financial account. Among the countries that did not modify substantially their stance, China and India maintain a high level of capital controls, while most AEs appear as persistently open.

If we consider the direction of flows and the asset category, we observe a generalized increase in the use of capital controls following the global financial crisis (figures 1 and 2). There is a strong difference in levels between AEs and EMEs; during the whole period 1997-2005 on average, KK_{it}^{tot} was 0.1 for AEs against 0.4 for EMEs (table 1). Moreover, while EMEs on average increased the level of capital controls in a generalized manner, AEs raised restrictions in a selective way, mainly on foreign direct investment inflows.[12]

In the spirit of Klein (2012), in order to classify economies according to their use of capital controls, it is important to consider the level of the aggregate indicators as well as the persistence over time. To this aim, we first compute a cross-country distribution of the aggregate indicator, taking the countries' averages during the whole period. In particular, we define for each country i:

[11]Notice that these additional two indicators are obtained by assigning the same weight to each investment type (FDIs, portfolio investments, other investments).

[12]These findings are broadly confirmed when we use the same sample employed for the econometric analysis, where we exclude small countries, oil exporters and countries from Sub-Saharan Africa (see Section 4.2).

$$\overline{KK}_i^{tot} = \frac{1}{T}\sum_t KK_{it}^{tot},$$

where T is the length of the time horizon. The distribution of $\overline{KK}_i^{tot}$ is strongly asymmetric, with a fat tail on the left, suggesting that most countries in the sample have a relatively low level of capital controls (the average, 0.29, is well above the median, 0.19). Hence, in every year we define open and closed countries according to the following criterion:

- Country i is "closed" in year t if KK_{it}^{tot} is above the 75th percentile[13] of the distribution of $\overline{KK}_i^{tot}$, that is if $KK_{it}^{tot} > 0.53$.
- Country i is "open" in year t if KK_{it}^{tot} is below the median of the distribution of $\overline{KK}_i^{tot}$, that is if $KK_{it}^{tot} < 0.19$.[14]

Subsequently, in order to account for the possibility that a country changes its status (from "closed" to "open" or viceversa), we divide the sample in four groups (table A.2), using the definitions given above:

1. A country is "persistently open" if it is open at least in 75% of the yearly observations and has never been closed in the remainder 25%.
2. A country is "persistently closed" if it is closed at least in 75% of the yearly observations and has never been open in the remainder 25%.
3. A country is "switching" if it has switched from being closed to open or viceversa in at least one year (and hence cannot be classified either as "persistently open" or as "persistently closed").
4. A residual category, including those economies which rarely achieve the status of "open" or "closed" and which however never switch at any given point in time from the status of "open" to the status of "closed". They are labeled as "episodic".

By comparing the four country groups, it stands out that persistently open economies are more developed both economically and financially than the rest of the sample, while the opposite holds for persistently closed economies (table 2). The other two groups lie between, with "switching countries" being more similar to persistently open economies. In a further robustness check, we also split the sample in two equal parts, according to

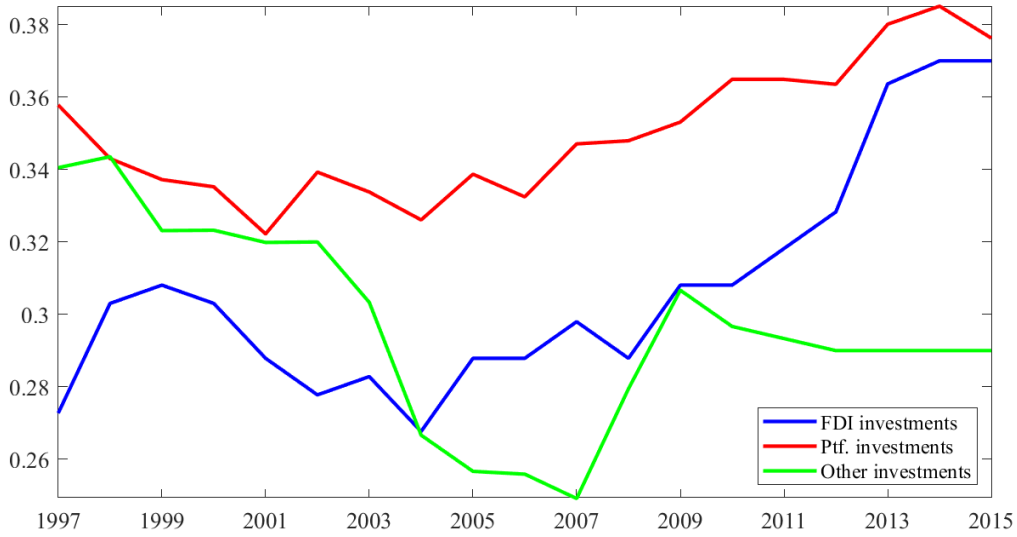
[13]Given the asymmetry of the distribution, we take the 75th percentile to discriminate between countries that make an extensive use of capital controls from the others.

[14]Notice that according to this criterion, it is possible that a country is not "closed" nor "open".

the country-level standard deviation of $\overline{KK}_i^{tot}$: if the latter is above the median, the country is labeled as "active". AEs and EMEs turn out as being evenly distributed between active and non-active countries. This suggests that even if AEs have on average less capital controls in place, half of them tend to modify periodically their stance. In addition, active countries tend to be less economically developed with respect to other countries, while differences in terms of financial development index are smaller.

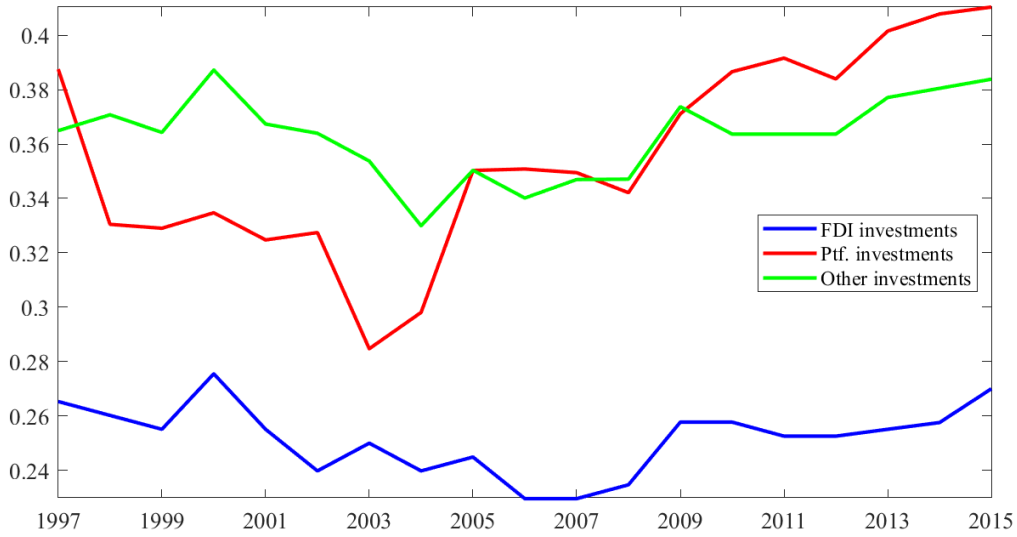
With the aim to explore the relationship between capital controls and financial development, we plot the $\overline{KK}_i^{tot}$ indices against the averages (across time) of the financial development index developed by Svirydzenka (2016) and released by the IMF (figure 3).We observe a negative relationship which can be explained by several factors. For example, economies with capital controls benefit less from financial integration and therefore their financial markets are less developed; on the other hand, economies with shallow financial markets may be induced to resort to capital controls to avoid spillover effects which are more likely to undermine financial stability (Fratzscher, 2012).

Figure 1: Controls by type of investment (inflows)
(cross-country means)



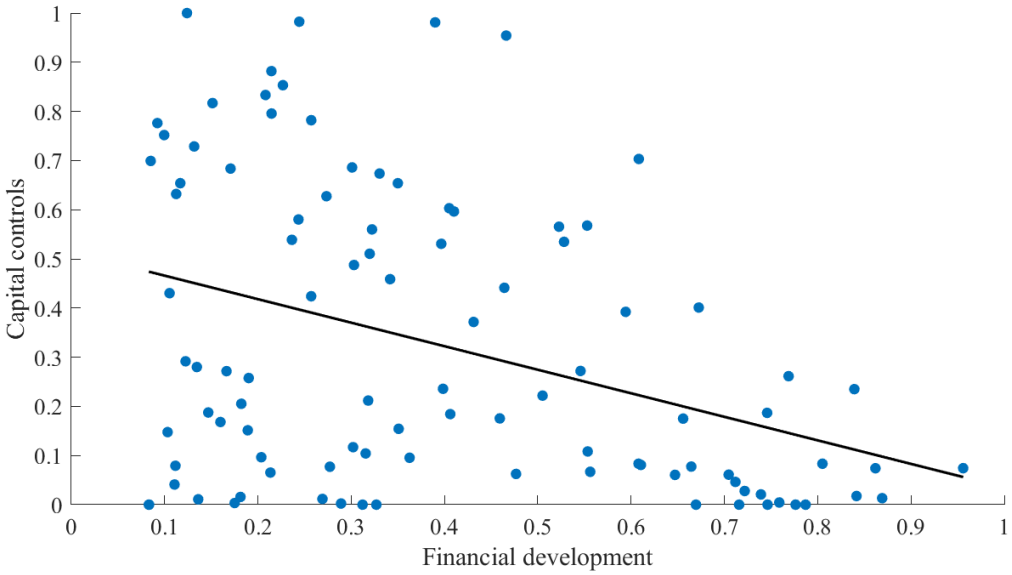
Capital controls on inflows by type of investment, average across countries. Source: Fernández et al. (2016) and our elaboration.

Figure 2: Controls by type of investment (outflows)
(cross-country means)



Capital controls on outflows by type of investment, average across countries. Source: Fernández et al. (2016) and our elaboration.

Figure 3: Capital controls and financial development



Capital controls are measured with $\overline{KK}_i^{tot}$ (i.e the within-country mean of the aggregate indicator) (source: Fernández et al. (2016) and our elaboration). Financial development is measured with the within-country mean of the index provided by Svirydzenka (2016) and released by the IMF. The black line represents the fitted values of a regression of capital controls on financial development.

Table 1: Capital controls indices
(cross-country means)

	Advanced economies			**Emerging economies**		
Capital controls	97-15	97-07	08-15	97-15	97-07	08-15
Aggregate indicator	0.10	0.10	0.11	0.40	0.38	0.41
Inflows	0.11	0.10	0.12	0.39	0.38	0.41
FDI	0.15	0.11	0.20	0.33	0.31	0.35
Portfolio	0.13	0.14	0.13	0.45	0.44	0.47
Other investments	0.03	0.04	0.02	0.38	0.38	0.39
Outflows	0.10	0.10	0.11	0.40	0.39	0.42
FDI	0.07	0.06	0.07	0.30	0.30	0.31
Portfolio	0.13	0.12	0.15	0.46	0.43	0.50
Other investments	0.11	0.12	0.11	0.45	0.44	0.47

Capital controls indices in AEs and EMEs. Source: Fernández et al. (2016) and our elaboration.

Table 2: Country groups

Country group	**Number of countries (EMEs)**	**Fin. dev. index**	**GDP per capita (USD)**
Pers. open economies	38 (17)	0.51	25,006
Pers. closed economies	25 (25)	0.36	2,885
Switching countries	12 (6)	0.48	15,643
Episodic controls	25 (21)	0.36	11,060
Active countries	50 (34)	0.40	13,091
Non-active countries	50 (35)	0.43	18,648
Total	100 (69)	0.42	15,916

Capital controls indices in several countries groups. Source: Fernández et al. (2016) and our elaboration.

4 Data and regression model

4.1 Dependent variables

The first goal of the work is to verify to what extent capital controls have an effect on the volume of capital flows. In this regard Forbes and Warnock (2012) argue that it is important to focus on gross flows instead of net flows, as the latter can mask dramatic changes in gross flows.[15] Before the mid-1990s researchers used to focus on net flows which roughly mirrored gross inflows. More recently, the literature has stressed that gross inflows (driven by foreign investors) and gross outflows (driven by domestic investors) tend to move independently. This entails that the effects of capital controls need to be analyzed separately for inflows and outflows and this is what we do in this paper. Moreover, in order to assess the effectiveness of capital controls for capital flow management purposes, it is also useful to look at the volatility of capital flows. From this perspective, it is crucial to see whether capital controls affect the probability of extreme episodes, such as capital surges and capital flights, reflecting dramatic increases of cross border investments.

We consider four categories of gross capital inflows: i) foreign direct investments; ii) portfolio investments; iii) other investments; and iv) total inflows, which are the sum of the three components. The same taxonomy is considered for gross capital outflows. The data come from the IMF Balance of Payments Statistics and are divided by GDP: gross inflows refer to the entry "net incurrence of liabilities", while gross outflows refer to "net acquisition of financial assets". If controls are effective, we expect that a tightening of capital controls on a given flow will reduce that flow.

Our second goal is to analyze whether capital controls affect financial stability and exchange rates. In principles, an increase in capital controls should i) reduce the probability of capital inflow surges and capital flights;[16] ii) dampen domestic credit growth by curbing banks' external borrowing; iii) depreciate the exchange rate by reducing the demand of domestic currency; iv) decrease the share of bank loans denominated in foreign currency, by constraining the ability of domestic banks to tap international markets.[17] Accordingly, we take as dependent variables in separate regressions: i) capital surges and capital flights; ii) the growth of domestic credit to the non-financial sector; iii) the exchange rate

[15] Justification for focusing on gross flows is also provided in Rothenberg and Warnock (2011) and Milesi-Ferretti and Tille (2011).

[16] Capital controls may also affect the other two categories of extreme events related to capital flows, i.e. stops and retrenchments. As we are interested in assessing capital controls as a tool to deal with large and volatile capital flows, we choose to focus on capital surges/flights which are related to excessive increasing inflows/outflows. By contrast, in order to prevent stop/retrenchment episodes capital controls should avoid that inflows/outflows fell too much below their average. We leave this analysis to future research.

[17] Data on domestic credit are obtained from the Global Financial Development Database (Cihak et al. 2013). Data on the currency denomination of bank loans come from the World Bank.

misalignments; and iv) the fraction of domestic loans denominated in domestic currency.

In our framework capital surges (capital flights) occur when two conditions are jointly verified in a given year: i) the annual year-over-year increase of the quarterly inflows (outflows) exceeds the five-year rolling mean by two standard deviations in at least one quarter during that year, as in Forbes and Warnock (2012); ii) the annual change exceeds 2% of GDP. Since we use annual data in our regression, we convert into annual data the information on capital surges and flights that is extracted from quarterly data; for example, if a capital surge occurs in the last quarter of year t and continues in the first quarter of year $t+1$, our dependent variable will take value 1 both in t and $t+1$. According to our definition, we identify capital surges and flights taking into account both the variability of flows (first condition) and their macroeconomic size (second condition); the respect of these conditions ensures that capital surges and flights are extreme episodes from both a statistical and an economic standpoint (see Crystallin et al., 2015). In our sample, capital surges and flights occur in 6.8% and 6% of our observations respectively. If we use the definition of Forbes and Warnock (2012), the occurrence of extreme episodes increases to 9.8% (for surges) and 9.9% (for flights). As expected, the correlation between our measure of extreme episodes and the one adopted by Forbes and Warnock (2012) is high (0.84 for surges, 0.78 for flights).

As regards exchange rate misalignments, we rely on the database EQCHANGE released by the CEPII which is the only public source providing estimates of the exchange rate equilibrium levels for a large sample of economies (Couharde et al., 2017). Using the Behavioral Equilibrium Exchange Rate (BEER) approach, they estimate three models assuming a long-run relationship between real exchange rates and their fundamentals, namely the level of productivity, net foreign assets, and terms of trade. Exchange rate misalignments are obtained as the deviations of the effective exchange rate from its equilibrium level.[18] In our regression, as a proxy of exchange rate misalignments we use an indicator included in the CEPII dataset: the indicator is the average of the estimates obtained through the three models and with different gauges of effective exchange rates.

4.2 Empirical specification

Following the literature, our baseline specification is a panel regression model without country fixed effects, given that capital controls display little variation over time; as Ostry et al. (2012) point out, the inclusion of fixed effects would make difficult to identify the effect of capital controls on dependent variables. For each category of flows $c = \{fdi, ptf, other\}$ and direction $d = \{in, out\}$, we estimate the following regression model:

[18] As regards the computation of the effective exchange rate, there are several methodological options concerning the number of trading country partners and the weighting schemes.

$$Y_{it}^{c,d} = \alpha + \beta KK_{it-1}^{c,d} + \gamma Z_{it-1} + \vartheta_t + \epsilon_{it}$$

where $Y_{it}^{c,d}$ denotes gross capital flows in percentage of GDP, category c, direction d, in country i, at time t; $KK_{it-1}^{c,d}$ is the correspondent capital control index, illustrated in the previous section: hence, for instance, if the dependent variable is FDI outflows ($Y_{it}^{fdi,out}$), the capital controls indicator used in the regression is $KK_{it-1}^{fdi,out}$; Z_{it} is a set of pull factors typically considered[19] as important determinants of capital flows: a measure of the real side of the business cycle (real GDP growth), a measure of the nominal side of the business cycle (the CPI inflation rate), an index of financial development, the public debt/GDP ratio as a proxy for country risk, the nominal exchange rate depreciation, a measure of trade integration (the sum of imports and exports divided by GDP) and a short-term interest rate; ϑ_t denotes year fixed effects to capture capital flows push factors; ϵ_{it} is the error term.[20]

As anticipated in the previous section, the same model is estimated also for five other dependent variables: i) capital surges and ii) capital flights; iii) domestic credit growth; iv) exchange rate misalignment; v) the percentage of domestic loans denominated in foreign currency. In these additional regressions, the capital control index is $KK_{it-1}^{tot,in}$, except for the regression on capital flights, where we use $KK_{it-1}^{tot,out}$. Nevertheless, in some cases we verify our results by using the capital controls indicator on the individual asset categories. In regressions i) and ii) we use a logistic model, since the regressands are dummy variables. In regression iv) we drop from the set of regressors the exchange rate depreciation and we include the first-difference of foreign reserves/GDP ratio and a set of dummy variables which measure the flexibility of the exchange rate regime;[21] moreover, given that the exchange rate is a fast-moving variable, we use contemporaneous values of all regressors but capital controls. In regression v) the sample starts in 2008 due to the availability of the dependent variable.

All variables (except those taking values in the unit interval, as capital controls) are winsorized at the 2% to dampen the impact of outliers. Standard errors are clustered at the country level and are robust to heteroskedasticity. As in Beirne and Friedrich (2017), we exclude small countries, oil exporters and countries from Sub-Saharan Africa (except South Africa): therefore, the initial sample of 100 countries, for which the capital controls index is available, is reduced to 65 countries (40 EMEs and 27 AEs). The sample period is 1997-2015, dictated by the availability of the capital control index (starting from 1997 for

[19] See for instance Bruno et al. (2017) and Beirne and Friedrich (2017).

[20] Data on control variables are obtained from the WEO, except for financial development (Svirydzenka (2016), released by the IMF) and the policy rate (Datastream).

[21] The dummy variables are provided by Ilzetzki et al. (2017), which classify countries in six categories according to the flexibility of the exchange rate.

the capital controls on portfolio inflows) and the financial development indicator (which ends in 2014 and enters the regression with a one-year lag).

Endogeneity issues, in particular reverse causality, are a possible concern in regressions testing the effectiveness of capital controls. In order to address endogeneity concerns, capital controls indicators enter the model with a one-year lag. Furthermore, we note that if countries tend to tighten capital restrictions when the volume of capital flows is high, or credit excessively grows or when the exchange rate is overvalued, the OLS estimates of our regression should be upward biased: as a consequence, if the coefficient on capital controls is estimated to be negative, reverse causality would make the result more robust. This observation has led many authors to employ an OLS regression when testing the effectiveness of capital controls, thus downplaying the endogeneity issue.[22] Clearly, we do not want to claim that this is identification is completely clean. Nevertheless, we are confident that our results help to assess the effectiveness of capital controls.

5 Results

5.1 Baseline specification

In this section we report and comment the estimation results obtained with our empirical model, for each dependent variable. The first set of regressions suggests that capital controls reduce the volume of capital inflows for all types of investments (table 3): according to the point estimate, a one-standard-deviation increase[23] in $KK_{it}^{c,in}$ (with $c = fdi, ptf, other$) reduces FDI, portfolio and other inflows in percent of GDP by 0.65, 0.45 and 0.7 percentage points respectively.[24] Notably, a one-standard-deviation rise in the aggregate indicator $KK^{tot,in}$ curbs total capital inflows in percent of GDP by 2.29 percentage points (corresponding to 21% of average total inflows, a number in line with what we find for the asset class-specific indicators). The signs of the other coefficients are in most cases reasonable, though not always significant. In particular, we find that capital flows are positively associated with a higher degree of trade openness, financial development, GDP growth, and interest rates, while higher public debt and exchange rate depreciation tend to reduce capital inflows. The inflation rate is positively associated with higher other inflows, while the estimated coefficients on FDI and portfolio inflows are negative but not significantly different from zero.

[22]For instance, Ostry et al. (2012) and Bruno et al. (2017) make a similar argument.

[23]The standard deviations of these indicators lie between 0.3-0.35, so the effects of a standard-deviation increase is quite comparable among asset classes. The same holds for controls on capital outflows (their standard deviation lies between 0.3-0.4).

[24]These numbers are economically relevant: FDI, portfolio and other inflows decrease by 15%, 18% and 20% of their respective means.

In our second set of regressions, we find that restrictions on portfolio and other investments lead to reduction in capital outflows (table 4): a one-standard-deviation increase of our indicators reduces portfolio and other outflows in percent of GDP by 0.83 and 0.87 percentage points respectively (around 29% and 35% of their means respectively). Instead, controls on FDIs have an impact on the correspondent outflows that is indistinguishable from zero, though the sign of the point estimate is anyway negative. If we consider total outflows, the impact is around a reduction of 2 percentage points, following a one-standard-deviation rise (around 24% of capital outflows mean). Regressors have all the expected sign, except for the interest rate, whose positive sign is more difficult to interpret.

The findings related to first two sets of regressions suggest that capital controls reduce the volume of gross capital flows. Another related question is whether capital controls decrease the probability of capital surges and capital flights. We test this hypothesis in our third set of regressions. The estimated coefficients on $KK^{tot,in}$ and $KK^{tot,out}$ are negative and statistically significant in the logit regressions on surges and flights respectively (table 5 and 6, first column). A one-standard-deviation increase in the indicators on average reduces the probability of surges and flight by 3% and 2% percentage points respectively. Our results differ from those obtained by Forbes and Warnock (2012) who do not find a significant effect of capital controls on extreme capital flows episodes. We claim that the main reason is our different definition of extreme episodes. As discussed in the previous section, our definition of surges and flights is stricter, because we also require that the annual change in capital flows exceeds 2% of GDP, in order to focus only on surges and flights that may have a sizable macroeconomic impact. When we use the same methodology of Forbes and Warnock (2012) to detect surges and flights, the coefficients of capital controls are no longer significant. This suggests that capital controls are effective in reducing the probability of extreme episodes only when changes in capital flows are important from a macroeconomic perspective.

Another rationale for the implementation of capital controls is to avoid that capital inflows fuel credit booms which can undermine financial stability. In this regard capital controls may help to mitigate the expansion of domestic credit. Consistently with this hypothesis, we find a significant effect on domestic credit growth only when we use the control on other inflows, which include bank loans (table 7, first column): a one-standard-deviation increase in controls on other inflows reduces credit growth by 1.3 percentage points.

Next, we assess whether capital controls lead to a reduction in the fraction of domestic loans denominated in foreign currency on the total domestic loans. Higher capital controls reduce the ability of domestic banks to tap international markets and hence reduce the

amount of foreign currency loans within the economy. On top of that, capital controls reduce also the ability of domestic agents to borrow directly from foreign banks. This is what we find in our estimated model (table 8, first column): the sign on $KK^{tot,in}$ is negative and statistically significant at the 1% level. Notably, the same holds for all categories of inflows controls. In particular, a one-standard-deviation increase in $KK^{tot,in}$ is associated with a reduction in foreign currency loans by about 13 percentage points.

Fratzscher (2012) and Pasricha (2017) point out that capital controls may be associated with mercantilist purposes, i.e. targeting the exchange rate in order to gain competitiveness in international trade. Then we estimate a regression in which the dependent variable is an indicator of exchange rate misalignment and the regressor of interest is $KK^{tot,in}$. Our findings suggest that capital controls on inflows significantly affect the level of exchange rate misalignment given by the difference between the effective exchange rate and its equilibrium level (table 9, first column): a one-standard-deviation increase in $KK^{tot,in}$ reduces the effective exchange rate by 7% respect to the equilibrium level.

5.2 Robustness analysis

In the empirical literature on the effectiveness of capital controls, results are mixed and hinge on several factors. The robustness of our results to the sample composition is a crucial aspect of our analysis since in the regression model we do not account for country fixed effects.[25] The reason is the little variation in our variable of interest within individual countries, since many economies tend to not vary the level of capital controls. As noticed by Eichengreen and Rose (2014), capital controls are persistent: once imposed, they tend to stay in place for long periods, once removed, they are rarely restored. Aware of this problem, in this section we put our estimation through some robustness checks in which we split the sample or exclude some countries, in order to verify whether the results of baseline regressions can be generalized or, alternatively, they are driven by some specific economies. In particular, we run regressions separately for AEs and EMEs. Another check is carried out by excluding from the sample those countries that we have classified as persistently closed economies: as Klein (2012) points out, it is important to distinguish between long-standing and episodic capital controls since they respond to distinct policy objectives and the effects on financial variables tend to be different. Moreover, given that a large fraction of countries tends to constantly maintain the capital

[25] In an additional robustness check, we also include region fixed effects. The main results do not change, the coefficient of interest always keeps the expected sign, even if in some regressions it loses significance. In particular, while we still find that capital controls reduce total inflows and total outflows, the effect on some components is not significant anymore. The correspondent tables are available upon request.

controls' policy stance, we carry out regressions considering only active countries, that is those countries that tend to change the capital controls stance more frequently (table A.3 provides details on the composition of the sub-samples). Tables with the estimated coefficients are reported in the next pages (tables 5-9) and in the Appendix (tables A.4-A.11).

As regards the effect of capital controls on aggregate inflows, our robustness analysis confirms the result of the baseline regression. The coefficient on $KK^{tot,in}$ is always negative and significant (table A.4). The coefficient is much higher for AEs (table A.4, column 3), given that these countries on average receive larger capital flows. When we exclude persistently closed economies or we consider only active countries, the effectiveness of capital controls continues to hold (table A.4, column 4 and 5).

We repeat the same exercise for FDI, portfolio and other inflows. With regard to FDIs, the results of the baseline regression are generally confirmed, except for AEs for which the coefficient is negative but the p-value is slightly above the 10% threshold (table A.5, column 3). The effect of capital controls on portfolio investments is always of the expected sign but strongly significant only for EMEs (table A.6, column 2). For other investments, we find that the effect of capital controls is significant only for AEs (table A.7, column 3). To sum up, the effects of capital controls on specific investment types tend to be differentiated: controls on FDIs reduce inflows across-the-board, those on portfolio investments are effective only for EMEs, while those on other investments mainly affect inflows in AEs. In the last two cases the results of the baseline regression become not significant when we exclude persistently closed economies.

With regard to outflows, the effects of capital controls are more evident for AEs and are mainly driven by portfolio and other investment (tables A.10-A.11, column 3). For EMEs, controls on outflows tend to be effective for FDIs, portfolio but not for the other investments and for the aggregate indicator (tables from A.9 to A.11, column 2). By excluding persistently closed economies or by considering only active countries, results are unchanged.

The baseline regressions indicate that capital controls on inflows reduce the probability of surges. This finding is confirmed for AEs (table 5, column 3) while the effect is not significant for EMEs (table 5, column 2). The effect is also significant when we restrict the sample to active countries and when we exclude persistently closed economies (table 5, column 4 and 5). Analogously, controls on outflows are associated with a lower incidence of capital flights; this finding holds for both AEs and EMEs (table 6, columns 2 and 3). Nevertheless, the coefficient loses significance when we exclude persistently closed economies (table 6, column 4).

As regards curbing domestic credit growth, we find that capital controls on other

investments are effective for AEs but not for EMEs (table 7, columns 2 and 3). Moreover, we do not find significant effects when we exclude persistently closed economies or we restrict the sample to active countries (table 7, columns 4 and 5). Accordingly, our baseline result that capital controls dampen domestic credit growth is mostly driven by AEs and persistently closed countries. Note that this last finding is not due to the fact that credit dynamics are slower in closed economies; indeed, on average credit growth in persistently closed economies (12.3%) is not very different from credit growth in other countries (11.4% on average); the credit expansion was even more pronounced in India and China (respectively 14.8 and 17.4%), both persistently closed economies. Our analysis does not support the use of episodic capital controls to dampen credit expansion, since the association with credit growth is not significant when we drop countries with long-standing capital controls. In this regard Klein (2012), using a different dataset on a smaller sample, finds that the significant association between long-standing capital controls and credit growth disappears when controlling for income per capita. By contrast, our results are confirmed when we include income per capita suggesting that our estimates are not biased by this omitted variable. To sum up, the results of the robustness analysis are not univocal, suggesting that the effects of capital controls on domestic credit, while robust for some countries, are not systematic.

The robustness analysis indicates that capital controls unambiguously reduce the fraction of loans denominated in foreign currency (table 8). This finding confirms that capital controls can help to reduce the currency mismatch of the economy, by reducing the volume of liabilities denominated in foreign currency.

Finally, the baseline regressions indicate that capital controls are associated with undervalued exchange rates. This outcome is confirmed for EMEs but not for AEs (table 9, columns 2 and 3). Our findings support the argument of several authors that there may be also mercantilist purposes behind the use of capital controls by some EMEs. The effect is robust also when we exclude persistently closed economies and when we consider only active countries (table 9, columns 4 and 5).

Table 3: Capital inflows

	(1)	(2)	(3)	(4)
Panel	Total	FDI	Portfolio	Other
OLS	inflows	inflows	inflows	inflows
Capital contr. (tot in)	-7.903***			
	(0.004)			
Capital contr. (FDI in)		-2.240**		
		(0.025)		
Capital contr. (ptf in)			-1.289**	
			(0.023)	
Capital contr. (other in)				-1.859*
				(0.099)
Growth	0.558**	0.0755	0.0250	0.305
	(0.023)	(0.377)	(0.691)	(0.108)
Fin. development	14.15***	1.468	6.603***	5.265**
	(0.002)	(0.352)	(0.000)	(0.036)
Public debt	-0.0274	-0.00321	-0.00956	-0.0113
	(0.256)	(0.733)	(0.228)	(0.469)
Trade openness	0.107***	0.0616***	0.00359	0.0346***
	(0.000)	(0.000)	(0.620)	(0.002)
Inflation	0.0260	-0.0720	-0.0485	0.161*
	(0.850)	(0.282)	(0.197)	(0.073)
Depreciation	-0.0185	-0.0174	-0.00303	-0.0119
	(0.731)	(0.384)	(0.821)	(0.747)
Short-term int. rate	0.173	0.131*	0.0226	-0.0345
	(0.280)	(0.061)	(0.586)	(0.713)
Constant	-4.086	-0.912	0.0547	-2.547
	(0.242)	(0.455)	(0.954)	(0.122)
Observations	885	892	892	885
Countries	65	65	65	65
R^2	0.376	0.413	0.239	0.202
Year FE	Yes	Yes	Yes	Yes

Robust p-values in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

Table 4: Capital outflows

	(1)	(2)	(3)	(4)
Panel	Total	FDI	Portfolio	Other
OLS	outflows	outflows	outflows	outflows
Capital contr. (tot out)	-5.621***			
	(0.009)			
Capital contr. (FDI out)		-0.616		
		(0.393)		
Capital contr. (ptf out)			-2.019***	
			(0.001)	
Capital contr. (other out)				-2.124**
				(0.020)
Growth	0.286	-0.0454	-0.0378	0.350**
	(0.216)	(0.601)	(0.638)	(0.038)
Fin. development	23.76***	9.548***	6.911***	6.999***
	(0.000)	(0.000)	(0.000)	(0.001)
Public debt	-0.0470**	-0.0123	-0.00822	-0.0288*
	(0.035)	(0.246)	(0.321)	(0.070)
Trade openness	0.129***	0.0518***	0.0430***	0.0342***
	(0.000)	(0.000)	(0.000)	(0.000)
Inflation	-0.00166	-0.0369	-0.0498	0.0857
	(0.991)	(0.294)	(0.286)	(0.425)
Depreciation	0.0332	-0.0107	-0.00776	0.0466
	(0.501)	(0.597)	(0.681)	(0.147)
Short-term int. rate	0.157	0.0897*	0.0212	0.0366
	(0.380)	(0.081)	(0.692)	(0.748)
Constant	-11.20***	-5.204***	-2.564**	-3.241
	(0.001)	(0.001)	(0.014)	(0.115)
Observations	880	891	887	885
Countries	65	65	65	65
R^2	0.462	0.396	0.455	0.237
Year FE	Yes	Yes	Yes	Yes

Robust p-values in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

Table 5: Capital surges

Logit surges	(1) Entire sample	(2) EMEs	(3) AEs	(4) No pers. closed	(5) Active
Capital contr. (tot in)	-1.601**	-0.617	-6.850***	-2.813**	-2.887***
	(0.015)	(0.462)	(0.001)	(0.045)	(0.008)
Growth	0.0817	-0.0469	0.158	0.0677	0.128
	(0.234)	(0.635)	(0.203)	(0.430)	(0.206)
Fin. development	0.491	0.0918	1.442	0.839	1.414
	(0.499)	(0.959)	(0.302)	(0.281)	(0.225)
Public debt	-0.00159	-0.0199**	0.00677	-0.000733	-0.00622
	(0.684)	(0.011)	(0.158)	(0.855)	(0.345)
Trade openness	0.000755	0.0118	-0.00158	0.000335	0.0114**
	(0.685)	(0.154)	(0.507)	(0.865)	(0.025)
Inflation	0.0702**	0.0212	0.271**	0.0738*	0.0564
	(0.047)	(0.655)	(0.033)	(0.097)	(0.208)
Depreciation	-0.0586*	-0.0733	-0.102**	-0.0755*	-0.0223
	(0.069)	(0.103)	(0.028)	(0.060)	(0.599)
Short-term int. rate	0.00613	0.0903*	0.140	0.0283	0.0114
	(0.864)	(0.100)	(0.281)	(0.476)	(0.818)
Constant	-2.967**	-2.686*	-4.279*	-2.940**	-3.588***
	(0.024)	(0.065)	(0.065)	(0.041)	(0.004)
Observations	579	218	246	477	213
Countries	65	37	28	53	29
Pseudo R^2	0.147	0.234	0.141	0.161	0.205
Year FE	Yes	Yes	Yes	Yes	Yes

Robust p-values in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

Table 6: Capital flights

Logit flights	(1) Entire sample	(2) EMEs	(3) AEs	(4) No pers. closed	(5) Active
Capital contr. (tot out)	-1.249**	-2.077***	-4.067**	-0.947	-1.531**
	(0.027)	(0.007)	(0.030)	(0.258)	(0.042)
Growth	0.0803	0.152	0.00585	0.0890	0.129
	(0.272)	(0.128)	(0.967)	(0.249)	(0.315)
Fin. development	0.342	3.126**	-1.268	0.310	0.323
	(0.598)	(0.049)	(0.153)	(0.654)	(0.723)
Public debt	-0.00695	-0.0265***	-0.00387	-0.00591	-0.00536
	(0.105)	(0.001)	(0.428)	(0.146)	(0.376)
Trade openness	0.00141	0.0253***	-0.00106	0.000284	0.0157***
	(0.516)	(0.000)	(0.688)	(0.892)	(0.005)
Inflation	0.00460	-0.0868**	0.0176	0.0100	-0.0104
	(0.882)	(0.030)	(0.882)	(0.787)	(0.810)
Depreciation	0.00371	0.0503*	0.00979	-0.00422	0.0179
	(0.872)	(0.094)	(0.787)	(0.881)	(0.526)
Short-term int. rate	0.000760	0.0827**	-0.00155	0.00628	-0.00565
	(0.980)	(0.017)	(0.988)	(0.826)	(0.910)
Constant	-2.220**	-3.547**	-1.284	-2.116**	-2.870*
	(0.031)	(0.041)	(0.379)	(0.047)	(0.069)
Observations	721	300	265	592	308
Countries	65	37	28	53	29
Pseudo R^2	0.113	0.264	0.112	0.128	0.142
Year FE	Yes	Yes	Yes	Yes	Yes

Robust p-values in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

Table 7: Credit growth

Panel OLS Credit growth	(1) Entire sample	(2) EMEs	(3) AEs	(4) No pers. closed	(5) Active
Capital contr. (other in)	-3.710**	-2.436	-9.909***	-0.781	-2.765
	(0.031)	(0.180)	(0.001)	(0.802)	(0.242)
Growth	1.436***	1.410***	1.617***	1.495***	1.644***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Fin. development	-4.860	-8.202	-2.257	-5.168	-10.64*
	(0.188)	(0.281)	(0.705)	(0.202)	(0.064)
Public debt	-0.0468***	-0.0735*	-0.0343*	-0.0350**	-0.0225
	(0.003)	(0.070)	(0.063)	(0.019)	(0.499)
Trade openness	0.00209	0.0741**	-0.0132**	-0.00371	0.0265
	(0.818)	(0.034)	(0.042)	(0.596)	(0.422)
Inflation	0.774***	0.553***	2.095***	0.900***	0.827***
	(0.000)	(0.002)	(0.003)	(0.000)	(0.009)
Depreciation	-0.328***	-0.355***	-0.292**	-0.379***	-0.308**
	(0.000)	(0.004)	(0.014)	(0.000)	(0.011)
Short-term int. rate	-0.132	0.174	-0.582	-0.308*	-0.147
	(0.431)	(0.403)	(0.244)	(0.078)	(0.536)
Constant	8.948***	4.714	6.185	8.979***	8.276
	(0.003)	(0.156)	(0.262)	(0.008)	(0.101)
Observations	886	444	442	724	418
Countries	65	37	28	53	29
R^2	0.474	0.445	0.573	0.498	0.560
Year FE	Yes	Yes	Yes	Yes	Yes

Robust p-values in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

Table 8: % FX denominated loans

Panel OLS FX Loans	(1) Entire sample	(2) EMEs	(3) AEs	(4) No pers. closed	(5) Active
Capital contr. (tot in)	-45.96***	-50.14***	-78.88**	-47.81***	-47.86**
	(0.000)	(0.000)	(0.021)	(0.000)	(0.040)
Growth	-0.0702	-0.651	-0.0210	0.134	0.539
	(0.896)	(0.217)	(0.982)	(0.828)	(0.452)
Fin. development	-27.46*	-40.20*	2.610	-25.53	-37.98
	(0.093)	(0.089)	(0.908)	(0.135)	(0.143)
Public debt	0.00675	0.473***	-0.0810	0.00544	0.0783
	(0.945)	(0.000)	(0.369)	(0.956)	(0.478)
Trade openness	0.0683**	0.0996	0.0409	0.0734**	0.240
	(0.030)	(0.268)	(0.388)	(0.036)	(0.165)
Inflation	0.722	1.210**	2.056	0.591	1.033
	(0.335)	(0.046)	(0.143)	(0.579)	(0.143)
Depreciation	-0.101	0.00852	-0.0639	-0.253	0.0463
	(0.537)	(0.956)	(0.859)	(0.135)	(0.678)
Short-term int. rate	1.403	-1.041	5.790	1.600	1.597
	(0.279)	(0.143)	(0.344)	(0.260)	(0.239)
Constant	41.24***	42.27***	20.36	39.37***	29.93
	(0.001)	(0.003)	(0.193)	(0.002)	(0.170)
Observations	291	155	136	262	142
Countries	43	24	19	38	20
R^2	0.368	0.670	0.416	0.367	0.446
Year FE	Yes	Yes	Yes	Yes	Yes

Robust p-values in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

Table 9: Ex. Rate misalignment

	(1)	(2)	(3)	(4)	(5)
Panel OLS	Entire	EMEs	AEs	No pers.	Active
EX rate mis.	sample			closed	
Capital contr. (tot in)	-0.242***	-0.267**	0.0424	-0.331**	-0.328***
	(0.001)	(0.010)	(0.808)	(0.030)	(0.005)
Growth	-0.0144***	-0.00952*	-0.0122***	-0.0192***	-0.0155**
	(0.001)	(0.096)	(0.000)	(0.001)	(0.018)
Fin. Development	-0.191**	-0.409	-0.253***	-0.238**	-0.303*
	(0.042)	(0.115)	(0.001)	(0.029)	(0.077)
Trade openness	-0.000449	-0.00155	-0.000186	-0.000364	-0.00168
	(0.162)	(0.236)	(0.188)	(0.261)	(0.241)
Inflation	0.00999	0.0113	-0.0121*	0.0113	0.0164
	(0.263)	(0.194)	(0.072)	(0.257)	(0.140)
Short-term int. rate	-0.0155	-0.0178	-0.00380	-0.0164	-0.0221*
	(0.143)	(0.104)	(0.562)	(0.134)	(0.095)
Reserves	-0.00350	-0.00610*	0.000635	-0.00483	-0.00905***
	(0.270)	(0.075)	(0.678)	(0.197)	(0.009)
Constant	0.00585	0.133	0.291***	0.0485	0.255
	(0.973)	(0.550)	(0.000)	(0.831)	(0.275)
Observations	894	439	455	738	415
Countries	65	37	28	53	29
R^2	0.254	0.292	0.302	0.236	0.315
Year FE	Yes	Yes	Yes	Yes	Yes
Regime dummies	Yes	Yes	Yes	Yes	Yes

Robust p-values in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

6 Conclusions

This paper has analyzed the effectiveness of capital controls in reducing the volume and the volatility of capital flows as well as in affecting credit growth, currency loans and exchange rate misalignment. Our results suggest that inflows controls significantly reduce capital inflows and tend to reduce the probability of a capital surge, make the exchange rate more undervalued in emerging markets and decrease the share of loans denominated in foreign currency. Moreover, we find that restrictions on outflows decrease the volume of capital outflows in advanced countries and lower the probability of a capital flight. Notably, we find that effectiveness of capital controls is highly heterogeneous either across countries and across asset classes. In particular, credit growth seems to respond only to capital controls on other investments and only in advanced economies.Our outcomes are similar to some related papers finding that capital controls can play a role in preserving financial stability.

However, in our view capital controls do not constitute a one-size-fits-all tool and their usefulness depends both on the objective and the degree of liberalization. In particular, in line with the IMF Institutional View, we claim that policy makers should not resort to capital controls in order to avoid the necessary financial reforms and warranted macroeconomic adjustment.

Moreover, our results should be weighed against the unintended consequences of the use of capital controls for mercantilist purposes. The strong association between capital controls and exchange rate misalignments that we document in this paper, chimes with OECD warnings about the risks related to a widespread use of capital controls.[26] Capital controls and exchange rate targeting while potentially beneficiary on short-term at country level, can lead to negative outcomes from a collective perspective, vanishing the benefits associated with global financial markets. The multitude of policy objectives associated with capital controls and the risk of a non-cooperative approach by individual countries call for a strengthened coordination at international level through the role played by multilateral organizations such as the IMF and the OECD. *"Countering the risk that process of [trade and] financial integration may go into reverse, requires, above all, political leadership and international coordination. But co-operation can also greatly benefit from a clear and globally recognized framework"* (Visco 2016).[27]

We think that the effectiveness of capital controls could be further analyzed, in at least two dimensions. First, capital controls may potentially affect variables that are

[26]See for example OECD (2017), "Open and Orderly Capital Movements - Interventions from the 2016 OECD High-Level Seminar".

[27]Intervention by Ignazio Visco, Governor of the Central Bank of Italy to the "OECD High-Level Seminar Open and Orderly Capital Movements".

strongly related each other; moreover, their effect is likely to last for some periods. These considerations could support the use of vector autoregression which, however, require observations at least at the quarterly frequency.[28] Second, an important step further would be to develop an indicator able to capture not only the extensive margin, but, more importantly, the change in the intensity of capital controls. We leave these issues to future research.

[28]Pasricha et al. (2015) make some steps in this direction.

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Appendix

A.1 Additional tables

Table A.1: Aggregation of capital controls dummies

Capital control by investment type	**Dummy restrictions on specific transactions: capital inflows**	**Dummy restrictions on specific transactions: capital outflows**
FDI	Direct investment inflows	Direct investment outflows
	Direct investment liquidation	Direct investment liquidation
Portfolio	Equity (purchase locally by non residents)	Equity (purchase abroad by res.)
	Equity (sale or issue locally by non res.)	Equity (sale or issue abroad by res.)
	Bond (purchase locally by non res.)	Bond (purchase abroad by res.)
	Bond (sale or issue locally by non res.)	Bond (sale or issue abroad by res.)
	Money market instruments (purchase locally by non res.)	Money market instruments (purchase abroad by res.)
	Money market instruments (sale or issue locally by non res.)	Money market instruments (sale or issue abroad by res.)
	Collective investments (purchase locally by non res.)	Collective investments (purchase abroad by res.)
	Collective investments (sale or issue locally by non res.)	Collective investments (sale or issue abroad by res.)
Other investment	Financial credits inflows	Financial credits outflows
	Commercial credits inflows	Commercial credits outflows
	Guarantees, sureties and financial backup facilities inflows	Guarantees, sureties and financial backup facilities outflows

Dummy variables are taken from Fernández et al. (2016).

Table A.2: Capital controls index KK_{it}^{tot} by countries

Persistently open	average	min	max
Austria	0.14	0.05	0.25
Belgium	0.08	0.00	0.17
Brunei	0.05	0.05	0.05
Canada	0.05	0.05	0.05
Costa Rica	0.07	0.03	0.13
Denmark	0.06	0.05	0.08
Egypt	0.16	0.03	0.25
El Salvador	0.08	0.00	0.17
Finland	0.13	0.05	0.30
France	0.06	0.00	0.10
Georgia	0.07	0.00	0.14
Guatemala	0.01	0.00	0.07
Hong Kong	0.02	0.00	0.08
Ireland	0.05	0.05	0.05
Israel	0.09	0.00	0.55
Italy	0.03	0.03	0.03
Japan	0.00	0.00	0.05
Latvia	0.07	0.05	0.20
Mauritius	0.12	0.07	0.13
Netherlands	0.00	0.00	0.00
New Zealand	0.10	0.10	0.10
Nicaragua	0.04	0.00	0.10
Norway	0.06	0.00	0.08
Oman	0.16	0.15	0.20
Panama	0.00	0.00	0.00
Paraguay	0.10	0.03	0.17
Peru	0.01	0.00	0.05
Qatar	0.11	0.05	0.20
Singapore	0.15	0.13	0.22
Spain	0.02	0.00	0.10
Sweden	0.07	0.00	0.23
Switzerland	0.16	0.05	0.35
Uganda	0.06	0.05	0.08
United Kingdom	0.01	0.00	0.05
United States	0.14	0.13	0.15
Uruguay	0.00	0.00	0.03
Yemen	0.12	0.05	0.15
Zambia	0.00	0.00	0.00

Switching	average	min	max
Argentina	0.59	0.10	0.90
Bulgaria	0.17	0.05	0.70
Chile	0.46	0.00	0.95
Cyprus	0.45	0.05	0.95
Greece	0.09	0.00	0.57
Hungary	0.26	0.00	0.75
Iceland	0.45	0.15	0.90
Korea	0.30	0.08	0.77
Lebanon	0.61	0.25	0.80
Malta	0.32	0.00	0.88
Romania	0.30	0.05	0.85
Slovenia	0.34	0.10	0.80

Episodic	average	min	max
Australia	0.28	0.13	0.35
Bahrain	0.27	0.22	0.43
Bolivia	0.17	0.10	0.33
Brazil	0.67	0.57	0.73
Czech Rep.	0.26	0.05	0.47
Dominican Rep.	0.25	0.17	0.32
Ecuador	0.26	0.10	0.40
Germany	0.18	0.00	0.30
Ghana	0.53	0.33	0.73
Indonesia	0.65	0.57	0.73
Jamaica	0.55	0.28	0.72
Kazakhstan	0.51	0.33	0.78
Kenya	0.33	0.30	0.35
Kuwait	0.35	0.32	0.45
Kyrgyz Rep.	0.22	0.06	0.46
Mexico	0.58	0.53	0.68
Moldova	0.65	0.55	0.80
Nigeria	0.15	0.13	0.20
Poland	0.73	0.55	1.00
Portugal	0.17	0.00	0.40
Russia	0.57	0.20	0.82
South Africa	0.63	0.57	0.70
Turkey	0.42	0.23	0.70
United Arab Em.	0.22	0.20	0.22
Venezuela	0.20	0.17	0.35

Persistently closed	average	min	max
Algeria	0.93	0.93	0.93
Angola	0.85	0.78	0.90
Bangladesh	0.82	0.80	0.85
Burkina Faso	0.65	0.63	0.70
China	0.97	0.80	1.00
Colombia	0.62	0.55	0.80
Cote d'Ivoire	0.78	0.75	0.85
Ethiopia	0.48	0.48	0.48
India	0.95	0.95	0.97
Iran	0.63	0.45	0.68
Malaysia	0.81	0.75	0.88
Morocco	0.76	0.72	0.77
Myanmar	0.76	0.52	1.00
Pakistan	0.73	0.63	0.85
Philippines	0.84	0.75	0.95
Saudi Arabia	0.66	0.60	0.82
Sri Lanka	1.00	1.00	1.00
Swaziland	0.83	0.80	1.00
Tanzania	0.94	0.65	1.00
Thailand	0.75	0.65	0.82
Togo	0.75	0.70	0.94
Tunisia	1.00	1.00	1.00
Ukraine	0.78	0.75	0.88
Uzbekistan	0.90	0.80	0.94
Vietnam	0.89	0.88	0.93

Capital controls indices in several country groups. Source: Fernández et al. (2016) our elaboration.

Table A.3: Country groups (estimation sample)

Group	Entire sample	AEs	EMEs
Pers. open	31	21	10
Pers. closed	13	0	13
Switching	9	3	6
Episodic	12	4	8
Total	65	37	28
Active	30	18	12
Non-active	35	16	19

Composition of country groups in the estimation sample. Source: our elaboration.

Table A.4: Capital inflows, robustness

Panel OLS Tot. inflows	(1) Entire sample	(2) EMEs	(3) AEs	(4) No pers. closed	(5) Active
Capital contr. (tot in)	-7.903***	-5.130**	-34.69**	-8.127**	-5.558*
	(0.004)	(0.032)	(0.032)	(0.049)	(0.067)
Growth	0.558**	0.173	0.610	0.650**	0.0995
	(0.023)	(0.463)	(0.292)	(0.028)	(0.606)
Fin. development	14.15***	1.831	25.97***	15.76***	5.852
	(0.002)	(0.718)	(0.001)	(0.002)	(0.369)
Public debt	-0.0274	0.0394	-0.0684*	-0.0317	0.0272
	(0.256)	(0.159)	(0.076)	(0.212)	(0.447)
Trade openness	0.107***	0.0575***	0.108***	0.115***	0.0268
	(0.000)	(0.006)	(0.000)	(0.000)	(0.306)
Inflation	0.0260	-0.0168	0.702	-0.0584	0.106
	(0.850)	(0.885)	(0.318)	(0.728)	(0.472)
Depreciation	-0.0185	-0.0482	-0.0569	-0.00847	-0.0564
	(0.731)	(0.437)	(0.662)	(0.903)	(0.288)
Short-term int. rate	0.173	0.0742	-0.645	0.248	-0.0734
	(0.280)	(0.437)	(0.389)	(0.178)	(0.680)
Constant	-4.086	1.986	-7.684	-5.651	4.265
	(0.242)	(0.438)	(0.256)	(0.156)	(0.299)
Observations	885	437	448	729	409
Countries	65	37	28	53	29
R^2	0.376	0.240	0.449	0.391	0.218
Year FE	Yes	Yes	Yes	Yes	Yes

Robust p-values in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

Table A.5: FDI inflows, robustness

	(1)	(2)	(3)	(4)	(5)
Panel OLS	Entire	EMEs	AEs	No pers.	Active
FDI inflows	sample			closed	
Capital contr. (FDI in)	-2.240**	-2.301**	-4.095	-2.755*	-1.486*
	(0.025)	(0.038)	(0.101)	(0.077)	(0.083)
Growth	0.0755	0.0518	-0.156	0.0574	0.0320
	(0.377)	(0.655)	(0.390)	(0.603)	(0.725)
Fin. development	1.468	0.389	7.028***	1.427	-2.517
	(0.352)	(0.893)	(0.008)	(0.440)	(0.149)
Public debt	-0.00321	0.0117	-0.0158	-0.00469	0.00828
	(0.733)	(0.403)	(0.293)	(0.625)	(0.611)
Trade openness	0.0616***	0.0346***	0.0691***	0.0655***	0.0314**
	(0.000)	(0.004)	(0.000)	(0.000)	(0.018)
Inflation	-0.0720	-0.0701	0.0794	-0.103	-0.00166
	(0.282)	(0.269)	(0.771)	(0.189)	(0.983)
Depreciation	-0.0174	-0.0182	-0.0356	-0.00965	-0.0316
	(0.384)	(0.456)	(0.380)	(0.692)	(0.110)
Short-term int. rate	0.131*	0.0650	-0.113	0.184**	0.0211
	(0.061)	(0.222)	(0.736)	(0.017)	(0.793)
Constant	-0.912	1.538	-4.108	-0.996	2.598
	(0.455)	(0.257)	(0.171)	(0.484)	(0.107)
Observations	892	443	449	730	416
Countries	65	37	28	53	29
R^2	0.413	0.250	0.488	0.429	0.213
Year FE	Yes	Yes	Yes	Yes	Yes

Robust p-values in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

Table A.6: Portfolio inflows, robustness

Panel OLS Ptf. inflows	(1) Entire sample	(2) EMEs	(3) AEs	(4) No pers. closed	(5) Active
Capital contr. (ptf in)	-1.289**	-0.875**	-0.603	-0.742	-1.378
	(0.023)	(0.044)	(0.713)	(0.329)	(0.105)
Growth	0.0250	0.0366	0.0481	0.0631	0.0115
	(0.691)	(0.315)	(0.790)	(0.399)	(0.909)
Fin. development	6.603***	3.036***	6.288**	6.797***	6.466***
	(0.000)	(0.006)	(0.035)	(0.000)	(0.003)
Public debt	-0.00956	0.00200	-0.0145	-0.0104	0.000374
	(0.228)	(0.822)	(0.233)	(0.191)	(0.971)
Trade openness	0.00359	0.00693	0.00234	0.00334	-0.000633
	(0.620)	(0.137)	(0.796)	(0.676)	(0.927)
Inflation	-0.0485	-0.0341	-0.171	-0.0830*	-0.0352
	(0.197)	(0.133)	(0.476)	(0.072)	(0.314)
Depreciation	-0.00303	-0.00680	0.0138	0.000960	0.000227
	(0.821)	(0.503)	(0.676)	(0.954)	(0.990)
Short-term int. rate	0.0226	0.0247	0.0789	0.0231	-0.0147
	(0.586)	(0.207)	(0.736)	(0.627)	(0.741)
Constant	0.0547	-0.0834	0.901	-0.00353	0.0170
	(0.954)	(0.874)	(0.644)	(0.997)	(0.988)
Observations	892	443	449	730	416
Countries	65	37	28	53	29
R^2	0.239	0.217	0.153	0.215	0.258
Year FE	Yes	Yes	Yes	Yes	Yes

Robust p-values in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

Table A.7: Other inflows, robustness

Panel OLS Other inflows	(1) Entire sample	(2) EMEs	(3) AEs	(4) No pers. closed	(5) Active
Capital contr. (other in)	-1.859*	-0.644	-14.59***	-2.063	-1.469
	(0.099)	(0.377)	(0.002)	(0.205)	(0.237)
Growth	0.305	0.0836	0.475	0.406*	-0.0404
	(0.108)	(0.479)	(0.341)	(0.096)	(0.805)
Fin. development	5.265**	-3.100	10.19*	5.920**	2.296
	(0.036)	(0.126)	(0.084)	(0.038)	(0.474)
Public debt	-0.0113	0.0199**	-0.0221	-0.0118	0.0265
	(0.469)	(0.030)	(0.379)	(0.472)	(0.146)
Trade openness	0.0346***	0.0143**	0.0367***	0.0370***	-0.00798
	(0.002)	(0.047)	(0.010)	(0.001)	(0.430)
Inflation	0.161*	0.0840	0.726	0.146	0.178
	(0.073)	(0.213)	(0.117)	(0.213)	(0.128)
Depreciation	-0.0119	-0.0286	-0.0265	-0.00406	-0.0389
	(0.747)	(0.452)	(0.751)	(0.930)	(0.358)
Short-term int. rate	-0.0345	0.00106	-0.569	-0.0375	-0.122
	(0.713)	(0.986)	(0.290)	(0.745)	(0.223)
Constant	-2.547	0.623	-5.559	-3.277*	1.561
	(0.122)	(0.492)	(0.206)	(0.084)	(0.338)
Observations	885	437	448	729	409
Countries	65	37	28	53	29
R^2	0.202	0.167	0.300	0.232	0.157
Year FE	Yes	Yes	Yes	Yes	Yes

Robust p-values in parentheses, *** p<0.01, ** p<0.05, * p<0.1..

Table A.8: Capital outflows, robustness

Panel OLS Tot. outflows	(1) Entire sample	(2) EMEs	(3) AEs	(4) No pers. closed	(5) Active
Capital contr. (tot out)	-5.621***	-2.120	-16.81**	-9.995***	-4.268**
	(0.009)	(0.181)	(0.044)	(0.000)	(0.028)
Growth	0.286	0.0575	0.0692	0.318	-0.170
	(0.216)	(0.758)	(0.905)	(0.258)	(0.264)
Fin. development	23.76***	7.936*	32.22***	26.39***	15.82***
	(0.000)	(0.069)	(0.000)	(0.000)	(0.004)
Public debt	-0.0470**	-0.0507***	-0.0592*	-0.0526**	-0.0410**
	(0.035)	(0.007)	(0.066)	(0.015)	(0.028)
Trade openness	0.129***	0.0354**	0.153***	0.138***	0.00599
	(0.000)	(0.021)	(0.000)	(0.000)	(0.718)
Inflation	-0.00166	-0.0456	-0.320	-0.148	-0.00679
	(0.991)	(0.588)	(0.617)	(0.331)	(0.957)
Depreciation	0.0332	0.0181	-0.0829	0.0657	0.00947
	(0.501)	(0.707)	(0.515)	(0.290)	(0.812)
Short-term int. rate	0.157	0.155**	-0.773	0.316*	0.00982
	(0.380)	(0.035)	(0.385)	(0.075)	(0.938)
Constant	-11.20***	0.197	-14.49*	-13.13***	2.091
	(0.001)	(0.911)	(0.068)	(0.000)	(0.426)
Observations	880	431	449	729	408
Countries	65	37	28	53	29
R^2	0.462	0.206	0.489	0.480	0.300
Year FE	Yes	Yes	Yes	Yes	Yes

Robust p-values in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

Table A.9: FDI outflows, robustness

Panel OLS FDI outflows	(1) Entire sample	(2) EMEs	(3) AEs	(4) No pers. closed	(5) Active
Capital contr. (FDI out)	-0.616	-0.860*	-3.584	-1.981*	-1.102*
	(0.393)	(0.094)	(0.132)	(0.075)	(0.058)
Growth	-0.0454	-0.0914	-0.181	-0.0610	-0.0157
	(0.601)	(0.353)	(0.434)	(0.575)	(0.855)
Fin. development	9.548***	6.343**	13.71***	10.20***	5.803***
	(0.000)	(0.011)	(0.000)	(0.000)	(0.000)
Public debt	-0.0123	0.00724	-0.0321	-0.0154	0.00132
	(0.246)	(0.247)	(0.107)	(0.169)	(0.864)
Trade openness	0.0518***	0.0203**	0.0585***	0.0561***	0.0192*
	(0.000)	(0.012)	(0.001)	(0.000)	(0.082)
Inflation	-0.0369	-0.00533	-0.115	-0.0646	-0.0509
	(0.294)	(0.841)	(0.610)	(0.156)	(0.127)
Depreciation	-0.0107	-0.0238	-0.0378	-0.000313	-0.0134
	(0.597)	(0.263)	(0.457)	(0.990)	(0.539)
Short-term int. rate	0.0897*	0.0292	-0.499	0.142**	0.0637
	(0.081)	(0.215)	(0.144)	(0.012)	(0.185)
Constant	-5.204***	-2.179***	-5.688	-5.762***	-2.214**
	(0.001)	(0.006)	(0.130)	(0.002)	(0.017)
Observations	891	442	449	729	415
Countries	65	37	28	53	29
R^2	0.396	0.211	0.387	0.400	0.203
Year FE	Yes	Yes	Yes	Yes	Yes

Robust p-values in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

Table A.10: Portfolio outflows, robustness

Panel OLS Ptf. outflows	(1) Entire sample	(2) EMEs	(3) AEs	(4) No pers. closed	(5) Active
Capital contr. (ptf out)	-2.019***	-0.972**	-4.377**	-2.263***	-1.330**
	(0.001)	(0.012)	(0.023)	(0.006)	(0.013)
Growth	-0.0378	0.0240	-0.441**	-0.0707	-0.117
	(0.638)	(0.372)	(0.029)	(0.491)	(0.109)
Fin. development	6.911***	3.708***	7.112**	7.451***	5.217***
	(0.000)	(0.005)	(0.010)	(0.000)	(0.000)
Public debt	-0.00822	-0.00362	-0.0192	-0.0107	0.00343
	(0.321)	(0.646)	(0.175)	(0.202)	(0.682)
Trade openness	0.0430***	0.00512	0.0542***	0.0469***	-0.00277
	(0.000)	(0.180)	(0.000)	(0.000)	(0.632)
Inflation	-0.0498	-0.0542**	-0.393*	-0.101*	-0.00488
	(0.286)	(0.016)	(0.051)	(0.075)	(0.907)
Depreciation	-0.00776	0.0171*	-0.0572	-0.00136	-0.00689
	(0.681)	(0.086)	(0.222)	(0.953)	(0.742)
Short-term int. rate	0.0212	0.0211	-0.166	0.0620	-0.0555
	(0.692)	(0.146)	(0.491)	(0.321)	(0.198)
Constant	-2.564**	-0.181	-0.671	-2.979**	0.874
	(0.014)	(0.716)	(0.832)	(0.012)	(0.461)
Observations	887	438	449	729	415
Countries	65	37	28	53	29
R^2	0.455	0.235	0.444	0.454	0.314
Year FE	Yes	Yes	Yes	Yes	Yes

Robust p-values in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

Table A.11: Other outflows, robustness

	(1)	(2)	(3)	(4)	(5)
Panel OLS	Entire	EMEs	AEs	No pers.	Active
Other outflows	sample			closed	
Capital contr. (other out)	-2.124**	-0.281	-4.628*	-4.163***	-1.527
	(0.020)	(0.767)	(0.082)	(0.000)	(0.198)
Growth	0.350**	0.141	0.730*	0.465**	-0.0311
	(0.038)	(0.247)	(0.080)	(0.034)	(0.658)
Fin. development	6.999***	-1.770	10.90***	8.624***	5.057
	(0.001)	(0.520)	(0.003)	(0.000)	(0.145)
Public debt	-0.0288*	-0.0574***	-0.00689	-0.0295*	-0.0479***
	(0.070)	(0.008)	(0.683)	(0.054)	(0.006)
Trade openness	0.0342***	0.00899	0.0395***	0.0350***	-0.0103
	(0.000)	(0.382)	(0.000)	(0.000)	(0.230)
Inflation	0.0857	0.0223	0.178	0.0255	0.0554
	(0.425)	(0.737)	(0.630)	(0.825)	(0.599)
Depreciation	0.0466	0.0274	0.0172	0.0633	0.0284
	(0.147)	(0.454)	(0.846)	(0.113)	(0.197)
Short-term int. rate	0.0366	0.0978	-0.0854	0.0861	-0.00502
	(0.748)	(0.113)	(0.855)	(0.449)	(0.950)
Constant	-3.241	2.503	-8.348**	-4.411**	3.306**
	(0.115)	(0.108)	(0.023)	(0.043)	(0.049)
Observations	885	436	449	730	409
Countries	65	37	28	53	29
R^2	0.237	0.201	0.322	0.265	0.209
Year FE	Yes	Yes	Yes	Yes	Yes

Robust p-values in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

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2018

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