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CAPITAL INFLOWS AND BOOMS IN ASSETS PRICES: EVIDENCE FROM A PANEL OF COUNTRIES*

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Abstract
Policymakers and academics often associate large capital inflows with booms in asset prices. To date, however, methodical evidence of this association is still limited. This paper provides a systematic empirical analysis of the link between capital inflows and booms in asset prices. Using a panel of 40 countries from 1990 to 2010 and controlling for other macroeconomic factors, the paper finds that the link varies across capital inflow categories and across countries. In particular, emerging countries are more likely to experience booms in asset prices during periods of large capital inflows. In line with leading theories of financial crises the paper finds that financial development, the quality of institutions and the exchange rate regime can potentially influence the association between capital inflows and booms in asset prices. In contrast, this paper does not find evidence to support the view that capital controls help reduce this association.

Resumen
Las autoridades de política y los académicos a menudo asocian los grandes flujos de capital con booms de precios de los activos. Hasta ahora, sin embargo, la evidencia metódica de esta asociación es limitada. Este documento provee un análisis empírico sistemático de la relación entre los flujos de capital y los booms de precios de los activos. Utilizando un panel de 40 países desde 1990 hasta 2010, y controlando por otros factores macroeconómicos, el documento concluye que el vínculo varía entre categorías de entradas de capital y entre los países. En particular, los países emergentes son más propensos a experimentar booms de precios de activos durante los períodos de gran afluencia de capital. En línea con las principales teorías sobre crisis financieras, se encuentra que el desarrollo financiero, la calidad de las instituciones y el régimen de tipo de cambio potencialmente pueden influir en la relación entre los flujos de capital y los booms de precios de los activos. En contraste, no se encuentra evidencia que apoye la visión de que los controles de capital reduzcan esta asociación.

"There are huge capital inflows going into emerging countries creating (the) risk of asset price bubbles"

Managing Director of the International Monetary Fund[1]

I. INTRODUCTION

Policymakers and academics often believe that large capital inflows are associated with *booms* in asset prices; and, therefore, with a higher risk of financial crisis. The belief is supported by the theoretical works of Krugman (1998), Caballero and Krishnamurthy (2006), Aoki et al (2009), Korinek (2010a and 2010b) and Adam et al (2011). Though different, these models provide a simple parable. When capital inflows enter into an economy, the demand of assets that are at rather fixed supply increases and asset prices move up. In general, because of financial market imperfections such as adverse selection and moral hazard, the economy´s borrowing capability is limited by the value of its assets. Thus the initial increase in asset prices increases the economy´s credit limit, promoting more capital inflows. New rounds of capital inflows evolve into a *boom* in asset prices through a sort of circular process, in which higher asset prices make financial conditions of the economy seem sounder than they actually are, promoting more capital inflows that in turn push asset prices even higher.

Although this belief is widespread in theory, so far is based solely on anecdotal evidence. Reinhart and Reinhart (2008) put this clearly: to date "there has been discussion and some <u>anecdotal evidence</u> to suggest that asset prices boom during some famous capital inflow bonanzas," but robust cross-country empirical evidence is yet to be documented methodically.

This paper attempts to help close this gap in the literature by providing a systematic empirical analysis of the relationship between capital inflows and *booms* in asset prices. If theory is right, three empirical regularities should emerge. First, large capital inflows will be associated with booms in asset prices. Second, the association will be influenced by the economy´s quality of institutions, level of financial development, degree of financial

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openness and exchange rate regime. And third the association will be different for different categories of capital flows.

While the first regularity is implied by most theoretical works, the second is suggested by models where underdeveloped financial markets and low quality of institutions amplify problems of adverse selection and moral hazard (Krugman, 1998; Aoki et al., 2009), and by models where the degree of financial openness and the exchange rate regime affect the size of externalities (Korinek, 2010). In these models adverse selection, moral hazard or an externality are key ingredients of the circular process. Finally, the third regularity comes from Krugman (2000), Aoki et al. (2009) and Korinek (2010). Aoki et al. (2009) clearly specify that the mechanism in their model applies only to non-equity related flows. Krugman (2000) argues that debt flows are more likely to exacerbate cycles in asset prices by encouraging excessive risky lending during booms, whereas FDI may help flatten cycles in asset prices through *fire sale FDI* during busts.

This paper looks for evidence of these empirical regularities by analyzing the experience of a sample of developed and developing countries in the quarters spanning 1990-2010. First, it constructs an indicator of *booms* in real asset prices that measures both the occurrence and the intensity of an event, using a *threshold method* similar to the one used in Mendoza and Terrones (2008) for identifying credit booms. The method divides real asset prices in each country into its cyclical and trend components, and identifies a *boom* as an episode in which real asset prices exceed its long-run trend by more than a given threshold. According to this method *booms* in asset prices reflect country-specific *unusually large* asset price expansions.

Then, I calculate the regression-based association between capital inflows and *booms* using a battery of panel regressions. Specifically, controlling for other macroeconomic factors, I estimate the association of *FDI*, *Portfolio* inflows (equity and bond) and *Other* capital inflows with *booms* in real asset prices. Among the control variables I include domestic and world GDP growth, inflation, the growth rate of government expenditures and a measure of global liquidity conditions. Also, I include measures of quality of institutions, level of financial development, degree of financial openness and exchange rate regime, both independently and interacted with each measure of capital

inflows, to consider the possibility that the links are influenced by these country characteristics. To control for potential endogeneity issues I use instrumental variables.

The results provide some ground to policymakers concerns and confirm previous theoretical findings. The estimations show that capital inflows are strongly associated with *booms* in asset prices, even when controlling for other factors. The mean effect, however, hides some interesting variation across countries and categories of capital inflows. In particular, while net debt inflows (portfolio and other) exhibit a strong and significant association with *booms* in real asset prices, the association with FDI inflows is not statistical significant. Furthermore, the association is only significant for emerging markets. Consistently with theory the results reveal that a low level of financial development and poor quality of institutions increase the link between large capital inflows and *booms* in asset prices. In addition, more flexible exchange rates lessen the degree of association. Finally, contrary to the predictions of theory, I do not find evidence that capital controls help reduce the association.

I am not the first to study the link between capital inflows and *booms* in asset prices; there are other relevant papers and I defer a discussion of -and relation to- them to the next section. Put simply, this paper´s contribution is to provide a collection of stylized facts characterizing the link between capital inflows and asset prices, providing the regularities that theory seeks to explain and highlighting some ways in which the theory is inconsistent with the data. In order to avoid misunderstanding, it could be helpful to state clearly the paper´s goal and argument. The goal is not to estimate deep parameters of a structural model or conduct a formal test of a given hypothesis. To be precise, I am not trying to predict the response of asset prices to changes in capital inflows, or the other way around. The goal is more humble; though not less important. Rather than estimate structural parameters or reveal a causal relationship, I attempt to gauge the strength of the association between capital inflows and *booms* in asset prices, and highlight the factors that influence it. I do not see this as a deficit of the paper; quite the contrary. As Summers (1991), I believe that "informal pragmatic empirical approaches to economic problems" have, potentially, more impact on the "growth of economic knowledge" than more formal econometric work.

II. THE LINKS BETWEEN CAPITAL INFLOWS AND BOOMS IN ASSET PRICES

I divide this section in two parts. First, I discuss what the theoretical literature offers as explanation of the potential link between capital inflows and *booms* in asset prices. Second, I review previous empirical works to help recognize the paper´s contribution to the literature.

A. Links in theory: the conceptual framework

A variety of theoretical models have been put forth to explain a potential link between capital inflows and *booms* in asset prices. Although the mechanics of the models differ, their common denominator is the presence of some kind of financial market imperfections -such as adverse selection, moral hazard or externality- that restricts the economy´s borrowing capability and amplifies the dynamics of asset prices in the presence of large capital inflows. In most works the chain of causation runs from large capital inflows to booms in asset prices. But some models argue that causation goes the other way around.

In a first family of models, born as a consequence of the Latin American and Asian crisis of the 1990s, the market failure stems from moral hazard and agency considerations (deposit security, implicit guarantees, imperfect monitoring, and so forth), that lead financial institutions to take on too much risk (e.g. McKinnon and Pill, 1996; Krugman, 1998). For example, Krugman (1998) develops a simple model where financial intermediaries are central players in the propagation mechanism. In the model, since financial intermediaries are seen as having an implicit government guarantee and are not subject to strict regulation, there is a severe problem of moral hazard. Moral hazard encourages financial intermediaries to take excessive debts to get involved in too much risky lending. More risky lending push up asset prices and starts a sort of circular process in which financial conditions of intermediaries seem better than they actually are, promoting more borrowing and lending that in turn pushes asset prices even higher. In other words, it creates a *boom* in asset prices.

Similarly, according to Caballero and Krishnamurthy (2001 and 2006), a key ingredient in the creation of *booms* in asset prices in emerging economies are their poor banking systems and severe corporate governance problems that are present. In an

economy with a poor regulated financial market, where it is difficult to enforce debtors to repay their debts unless they are secured by collateral, the borrower credit limit is affected by the price of its assets, and the price of assets is affected by the credit limit. Once again the interaction between the credit limit and asset prices turns out to be a propagation mechanism which may engender *booms* in asset prices. Also, Aoki et al (2009) show that the degree of financial development determines the vulnerability of the domestic economy to shocks to private capital inflows in equity and debt (they do not address issues related to sovereign debt and FDI).

A second family of models instead of condemning financial intermediaries, as implicitly done by the previous works, puts the blame on the side of atomistic private investors who do not internalize the consequences of their decisions. This externality represents a different kind of market failure. It might happen even when private agents form rational expectations about the evolution of macroeconomic variables. That is, "agents correctly perceive the risks and benefits of their decisions, but fail to internalize the general equilibrium effects on prices" (Bianchi, 2010). In the case of firms, a similar friction arises when there are asymmetric financing opportunities for different sectors of the economy (see Caballero and Krishnamurthy, 2001; Tornell and Westermann, 2002).

Finally there is a third and different family of models that also incorporates a borrowing constraint that limits households´ leverage. The more recent models study the claim that global financial crisis of 2008-09 was precipitated by a *boom* in asset prices generated by a global saving glut. Adam et al (2011)´s model assumes that households form subjective beliefs about price behavior and update them using Bayes' rule. The response of the economy to exogenous shocks depends on agents' beliefs at the time, which are a function of the country specific history prior to the shock. Therefore, belief dynamics can temporarily delink asset prices from fundamentals, so that low interest rates can fuel a *boom* in asset prices. Furthermore, from a theoretical point of view, asset prices can have significantly changes without any changes in quantities. This can happen, for example, if there is a change in fundamentals that increase the demand of assets, and reduces the supply at the same time. In this case, prices will increase without any significant change in quantities.

In brief the theoretical literature clearly implies that there is a potential strong association between capital inflows and *booms* in asset prices. But they also show that some country characteristics can magnify the association. In particular, most works imply that the level of financial development and quality of institutions, which affect problems of moral hazard and adverse selection, play a key role in stimulating the link.

Other works call attention to other important factors, such as the exchange rate regime and the level of financial openness (capital controls). Yellen (2011) argues that heavily managed exchange rate regimes may provide incentives for the circular process to arise. Magud et al (2011) argue that the more flexible the exchange rate regime is, the easier it is to absorb capital inflows and partially dampen the effects of the latter on domestic credit. Consistently, Mendoza and Terrones (2008) find that credit booms in emerging economies are far more frequent in the presence of fixed or managed exchange rates, than under floating or dirty floating regimes. It should be easy to understand why. Fixed or managed exchange rate, make investors underestimate the volatility of the exchange rate, amplifying the externality and promoting excessive borrowing from abroad. In sum, theory suggests that a more flexible exchange rate regime could help stop the circular process: the exchange rate regime can potentially affect the degree of association between capital inflows and *booms* in asset prices.

Also, at least since Diaz-Alejandro (1985), a story that many economist tell is that when emerging economies open up to financial markets, they increase the probability of asset price *bubbles* and financial crisis. In a recent theoretical paper, Korinek (2010) argues that capital controls can help reduce externalities by making investors internalize the general equilibrium effect of their decisions. Hence, theory implies that the degree of financial openness can potentially influence the *link* between capital inflows and *booms* in asset prices.

Finally, theory also suggests that the *link* depends on the types of flow. Conceptually, it is easy to see why debt flows might have a stronger association with booms in asset prices than FDI flows. Unlike FDI, they do not solve agency problems, can lead to inefficient capital allocation if domestic banks are poorly supervised, and generate moral hazard when debt is implicitly guaranteed by the government or international financial

institutions. Korinek (2010) provides support to the idea that the composition matters by showing the different magnitude of externalities created by different types of capital inflows. In particular, Korinek suggests that FDI does not impose an externality since it often stays in the country when a financial crisis hits, and do not need to be taxed.

To sum up, the theory reviewed here insinuates the existence of three empirical regularities: (1) there is a strong link between capital inflows and booms in asset prices; (2) the link is influenced by country characteristics such as quality of institutions, financial development and openness, and exchange rate regime; and (3) the link is different for different types of capital flows. Section III of this paper looks for these empirical regularities in the data.

B.   Links in the data: a review of previous empirical works

A number of empirical studies, analyzing episodes of large capital inflows, highlight the existence of a strong association between capital flows and *booms* in asset prices (e.g. Calvo et al (1996); Sarno and Taylor, 1999; Kaminsky and Reinhart, 1999; Reinhart and Reinhart, 2008; Cardarelli et al, 2010). The evidence shows that periods of large capital inflows can be associated with currency appreciation, overheating, higher current account deficit and *booms* in domestic credit and *asset prices*. But since these papers do not concentrate on the link between capital inflows and *booms* in asset prices, as acknowledged by Reinhart and Reinhart (2008), they only provide discussion and anecdotal evidence, not methodical cross-country empirical evidence. One of the first to focus exclusively on this link (as far as I am aware of) was Jansen´s (2003) case study of the Thailand economy during 1980-1996. Using a VAR approach, Jansen finds capital inflows to be associated with higher asset prices (an increase of 1% in capital inflows increases real stock prices 1% on impact and ultimately, more than 3%). Also, Kim and Yang (2008) investigate the effect of capital inflows on asset prices applying panel VAR to a group of emerging Asian economies. Their results suggest that although capital inflows contribute to *booms* in asset prices, they only explain a small part of asset price fluctuations. One of the many things that distinguish these papers from mine is that they are case studies, whereas this paper is a cross-country investigation.

There are some recent cross-country studies focusing on the relationship between current accounts deficits, capital inflows and asset prices. For example, Aizenman and Jinjarak (2009) look at the association between the current account and real estate prices across countries. Controlling for lagged GDP per capita, inflation, institutions and interest rates, they find a robust and positive association. Similarly, Sá et al (2011) analyze the impact of monetary policy and capital inflows on house prices in OECD countries. They find that capital inflows have a significant and positive effect on both house prices and credit to private sector. They also find that the legal system affect the impact of capital inflows on house prices. In a similar vein, Jinjarak and Sheffrin (2011) explore the issue of causality between real estate prices and the current account. They find that current account deficits directly drove real estate prices in Ireland, Spain and United States, but that the effect in England was only transitory.

Three things differentiate this paper from Sá et al (2011) and Jinjarak and coauthors. First of all, while they concentrate mainly on advanced economies, this paper is particularly interested in emerging economies. The interest in emerging economies is justified, in part, by the simple evidence presented in Figure 1. Figure 1 presents a scatter plot with the association between capital inflows and asset prices in the horizontal axis and the level of development -measured by per capita GDP in 2010 US dollars- in the vertical axis. The plot suggests that the association is significantly stronger, and therefore more relevant, in emerging economies.

Second, Sá et al (2011) and Jinjarak and coauthors do not consider, explicitly, if the link is influenced by country characteristics such as quality of institutions, level of financial development, exchange rate regime and degree of financial openness. This is relevant not only because it is implied by theory and simple data (Figures 2 to 5 show that the association is negatively related with the quality of institutions, financial development, financial openness and a less flexible exchange rate regime), but also because it has important policy implications. For example, knowing if the degree of financial openness can reduce the link can help policy makers decide if capital controls might be a useful policy tool; or, if it's a better idea to adopt a given exchange rate regime, or invest resources to improve the quality of institutions and regulation.

And third, previous papers do not discriminate by capital inflow category. Once again, theory and simple evidence suggest that composition is relevant. Figure 6 shows that portfolio flows have a stronger association with asset prices than FDI inflows. Moreover, the composition also has policy implications. It helps policymakers distinguish types of capital inflows that are bad, good and ugly; helping them choose which categories to target. This paper main contribution to the literature is, indeed, to provide a systematic empirical analysis along these three lines.

III.   SAMPLE, DATA ISSUES, METHODOLOGY AND RESULTS

A. Data Sources

I gathered from Bloomberg end-of-the-period indices of stock markets (MSCI indices in Local Currency Unit (LCU)) at quarterly frequency from 1990q1 to 2010q3. I deflate the MSCI indices in LCU with the respective CPI, and call the resultant series *real asset prices.* Then, I create a variable called "booms in asset prices*"* which measures both the occurrence and the intensity an event. Following Mendoza and Terrones (2008) definition of a boom in credit, I define a *boom in asset prices* as an episode in which real asset prices grow more than during a typical cycle expansion. Figure 7 presents examples of how this variable is created for Australia and Mexico. The figure presents the evolution of the deviation from the long-run trend of real asset prices, and the horizontal line represents the corresponding standard deviation. To be clear, let l_{it} represent the deviation from the long-run trend of real asset prices in country i, date t, and $\sigma(l_i)$ the corresponding standard deviation of the cyclical component. The long-run trend is calculated using the Hodrick-Prescott (HP) filter with the smoothing parameter set at 1600, typical for quarterly data. A *boom in asset prices* occurs in country i when there is one or more contiguous dates for which $l_{it} \geq \varphi\sigma(l_i)$; in other words, when the *boom* condition holds. Thus, during a *boom* the deviations from trend in real asset prices exceed the typical expansion of asset prices over the business cycle by a factor of φ (the *boom* threshold factor) or more. [2] This variable is equal to zero during

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[2] I used a baseline value of ф = 1.5 in all the regressions reported in the paper. However, I conducted sensitivity analysis for ф = 1, 2 which confirmed that the main results are robust to the value of ф.

normal times and equal to the deviation from trend during *booms*. The advantage of using this indicator is that it measures both the occurrence and the intensity an event.

The data on the relevant macroeconomic variables are taken from International Financial Statistics (IFS) and World Development Indicators (WDI). Following the literature, I obtained from IFS quarterly data on the growth rate of real GDP (annualized rate), Consumer Price Index inflation (CPI Inflation) and the growth rate of real government expenditure. Annual data on domestic credit provided by the banking sector as a percentage of GDP (Financial Depth) and nominal GDP in US dollars were obtained from WDI. I obtained the US interest rate from IFS and use International Country Risk Guide (ICRG) scores on law & order (the higher the better) as a proxy for quality of institutions.

Finally, for capital flows I use quarterly data from the International Financial Statistics (IFS). Although there are other data sources, IFS provides the most comprehensive and comparable data on international capital flows. In practice, both changes in liabilities and assets are reported as net of any disinvestment and consequently both can have any sign. In the database, an increase (decrease) in liabilities to foreigners is entered as positive (negative) while an increase (decrease) in foreign assets held by locals is entered as negative (positive). Thus, net flows of capital are calculated as the sum of the flows of foreign claims on domestic capital (change in liabilities) and the flows of domestic claims on foreign capital (change in assets) in a given quarter.

The main categories of capital flows used are foreign direct investment (FDI), portfolio equity investment, portfolio debt investment and other flows. *FDI flows* include equity capital, reinvested earnings, other capital and financial derivatives associated with various intercompany transactions between affiliated enterprises. FDI includes greenfield investments and equity participation giving a controlling stake. When a foreign investor purchases a local firm's securities without exercising control over the firm, the investment is regarded as a portfolio equity investment. *Portfolio Equity investment* includes shares, stock participations, and similar documents (such as American Depository Receipts) that usually denote ownership of equity. *Debt Portfolio securities* include bonds, debentures, notes, and money market or negotiable debt instruments. Finally, *Other flows* include all financial transactions not covered in direct investment, portfolio investment, financial derivatives, or

other assets. Major categories are trade credits, loans, transactions in currency and deposits, and other assets. I divide each category of capital flows by current GDP in US dollars obtained from WEO 2011.

After combining the national domestic stock markets data with the capital inflows data and macroeconomic variables, the sample covers the period of 1990q1 to 2010q3 for 40 countries, of which 20 are developed countries. Table 1 report the sample of countries employed and Table 2 provides a description and the primary sources of the variables. Tables 3 and 4 provide the number of observations, sample averages, and the Mackinnon approximate p-value of the Dickey-Fuller test under the null hypothesis of a unit root for in the individual series for each country. Under the null hypothesis of a unit root the rejection rates of the tests for real asset prices appreciation and most of the capital inflows variables are conclusive: the series are stationary.

B. Data Issues

Although the IFS data are the most comprehensive, there are several issues associated with the compilation of the BOP Statistics, as discussed in greater detail by Lane and Milesi-Ferretti (2002). Data are missing for many countries, in particular for the early nineties, therefore, the time coverage of the data varies substantially from country to country. For example for Belgium the data begins in 2002, for Colombia and Singapore in 1996, Malaysia in 1999, Russia and Venezuela in 1994. In addition, some countries do not report data for all forms of capital flows. Unfortunately, it is difficult to verify whether the data are in fact missing as opposed to simply being zero. Additionally, Lane and Milesi-Ferretti suggest that there are a number of measurement problems with debt data related to different methodologies for recording non-payments, rescheduling, debt forgiveness, and reductions. I recognize these are important limitations of the database that may bias the estimates, but is something I have to live with.

C. Empirical Estimation and Results

The empirical analysis consists of explaining *booms* in real asset prices as a function of international capital inflows, external shocks, and domestic conditions. The objective is to

study the simple association between *booms* in asset prices and different types of capital inflows, as well as of various shocks; and to consider whether this association is influenced by the degree of financial openness, quality of institutions, financial development and the exchange rate regime. By conducting these exercises, the paper aims to provide a comprehensive empirical assessment of the *link* between capital inflows and *booms* in asset prices.

The exercise is guided by the theoretical and empirical papers reviewed in section II. I estimate the regression-based association between different categories of capital inflows and booms in real asset prices across countries, applying a battery of panel regressions, controlling for relevant macroeconomic variables. Aizenman and Jinjarak (2009) use a similar approach to study the association between current account deficits and appreciation in real estate prices.

The point of departure is a standard regression equation designed for estimation using (cross-country, time-series) panel data:

$$Boom_{i,t} = \beta_0 + \beta_1 CV_{i,t} + \beta_2 CF_{i,t} + \mu_t + \eta_i + \varepsilon_{i,t}, \quad (3.1)$$

where the subscripts *i* and *t* represent country and time period, respectively; *Boom* is the measure of *booms* in asset prices, *CV* is a set of control variables, and CF represents capital flows; μ_t and η_i denote unobserved time- and country-specific effects, respectively; and ξ is the error term. To perform the estimations, I use pooled cross-country and time-series data panel that, I remind the reader, covers 40 developing and developed countries over the period 1990q1-2010q3. The panel is unbalanced, with some countries having more observations than others.

The control variables represent factors that can, potentially, be associated with *booms* in asset prices. To correctly estimate the association between capital inflows and booms in asset prices these factors need to be controlled for. I control for factors that can be directly associated with asset prices. With regard to this group, the regressions include the growth rate of output and areas of monetary and fiscal policy, to capture the role of structural and stabilization policies. To control for the state of the economy, in each regression the corresponding growth rate of output is used. This is crucial to test whether the economy is booming, in which case it is more likely to see asset prices booming too.

Aggregate output is perhaps the most important variable representing the domestic economic condition, which may affect asset prices both through its association with capital inflows and through other channels. The consumer price index (CPI) inflation rate shows the nominal and monetary condition of the economy, which can also be associated with asset prices. Fiscal policy affects domestic investors´ decisions and thereby affects asset prices. To analyze the link between capital inflows and booms in asset prices it is essential that I control for these factors: if an important factor is not included in the model, there could be an omitted variable bias and all the effects of these factors may be captured as association between capital inflows and asset prices.

Table 5 reports in columns 1 through 3 the estimation for different groups of countries. Column 1 presents the regression using the entire sample of countries. With respect to the controls, they have the expected signs but are not always significant. While the growth rate of real GDP seems to be positively associated with *booms*, inflation is negatively associated with them, though the association is not always significant. The growth rate of government expenditure is, in general, statistically insignificant. Also, column 1 indicates that all categories of net capital inflows are positively associated with *booms* in real asset prices. However the coefficients in the regression hide interesting variation across countries. Therefore, to account for the variations columns 2 and 3 divide the sample between advanced and emerging economies. Comparing columns 2 and 3 I observe that the strong association between capital inflows and booms in real asset prices holds only in emerging economies. In column 3, when I only use the sample of advanced economies, the association is not statistically significant.

Certainly the methodology used in Table 5 is subject to criticism. In particular, there are problems of endogeneity because some variables affect asset prices but they also affect capital inflows. I try to take care of this issue by using instrumental variables. The method of instrumental variables provides a simple solution to the problem of the endogeneity of capital inflows. To use this approach we need observable variables, not present in the previous estimation, that satisfy two conditions. First, they should not be correlated with the error term; in other words, they need to be completely exogenous. And second, they

need to be correlated with capital inflows. The instruments that I use satisfy the two conditions.

The instruments are the domestic factors but also the external factors, which can be associated with asset prices but mainly through their relation with capital inflows. This fact should be clear: in an economy totally closed to international financial markets, where by definition capital inflows are non-existent, external factor can not affect domestic financial markets. But when the economy opens and allows movement of foreign international flows, international factors affect domestic asset prices through their effect on capital flows.

Among the external factors, I consider international financial conditions, proxied by US interest rate, the VIX, and the growth rate of real world GDP. The inclusion of the VIX variable is important because, as shown by Forbes and Warnock (2011), a measure of global risk is the most consistent driver of capital flows. Since these variables only affect asset prices through capital inflows, I only considered them in the first stage of the two-stage least square -when I instrument for capital inflows. I report the results using instrumental variables in columns 1 through 3 of Table 6.

Comparing with previous results, using the sample of all countries the findings in column 3 indicate that not all types of capital inflows can be associated with *booms* in real asset prices. Here, I find that only Net Portfolio Debt inflows are positively and significantly associated with booms in real asset prices. Once again, the results show that this association is significant only in emerging economies. Column 3 shows that for developed countries all categories of capital inflows remain insignificant.

To summarize, Tables 5 and 6 provide the first two statements of the paper: not all types of capital inflows can be associated with booms in real asset prices; and the association is only relevant for emerging economies. This result contrasts with the findings of Aizenman and Jinjarak (2009) and Sá et al. (2011) who find that in OECD countries the current account balance (a close measure of total net capital inflows) is significantly associated with booms in real estate prices. Theory provides the reasons why emerging economies are more likely to be associated with booms in asset prices. First, these economies tend to have underdeveloped financial markets and poor regulation, which amplify the problems of moral hazard and adverse selection that feed the cycle described in

section II. It is now appropriate to study whether these factors influence the association. Furthermore, motivated by theory, it is also pertinent to explore the roll of the exchange rate regime and financial openness.

In the framework of the panel data methodology, I now assess these issues by allowing the association of each measure of capital inflows and booms in asset prices to vary with quality of institutions, the level of financial development and financial openness, and the exchange rate regime. I do this by interacting each capital inflow measure with linear measures of the variables in each country and each period. The regression equation I estimate in this case is the following,

$$Boom_{i,t} = \beta_0 + \beta_1 CV_{i,t} + \beta_2 CF_{i,t} + \beta_3 (CF_{i,t} * Interactions_{i,t}) + \mu_t + \eta_i + \varepsilon_{i,t}. \quad (3.2)$$

The variables I use as interactions are: quality of institutions, exchange rate regime, Financial Depth and Financial Openness. Table 7 reports in columns 1 through 4 the estimations including the interactions individually. Column 1 interacts capital inflows with a measure of financial depth; column 2 with the measure of financial openness of Chinn and Ito (2008); column 3 with the exchange rate regime, as defined by Reinhart and Rogoff (2004); and column 4 with a measure of institutional quality. Finally, column 5 includes all the interactions simultaneously. In all columns I control for other macroeconomic factors.

In general, the results presented in Table 7 are in harmony with our expectations. The first insight is that net inflows of portfolio debt are significantly associated with booms in real asset prices in all regressions. This reinforces the findings reported in Tables 5 and 6.

Portfolio equity also comes out significant and positive in all the estimations except the one in column 3. Column 3 includes only the interaction between capital inflows and the exchange rate regime. A surprising result of column 3 is that *booms* in real asset prices seem to be more likely in countries with flexible exchange rates; reflected in the coefficient accompanying the measure of *Exchange rate regime*. Other inflows only appear significant in columns 1 and 2.

On the other hand, I find that Inflows of FDI are not significantly associated with booms in asset prices. This result was expected. Krugman (2000) argues that FDI inflows help smooth cycles in domestic asset prices, indeed, they should not be linked to *booms*.

For the case of the control variables, I find that not all these factors are significantly associated with booms in asset prices. Only the growth rate of real GDP is significant in all regressions. An expected result indicating that asset prices are more likely to *boom* when the economy as a whole is booming.

When I interact with the measure of financial depth only –a proxy for financial development- I find that the coefficient is negative but statistically significant only in the case of portfolio inflows (column 1). The level of financial development seems to reduce the link between booms in asset prices and portfolio inflows, both equity and debt. But there is no significant effect for FDI or other inflows.

In the case of financial openness, the interaction is negative and significant for all types of capital inflows (column 2). This suggests that more capital controls increase the association between capital inflows and booms in asset prices. A surprising result I discuss below.

The coefficients for the interactions of capital inflows and the measure of the exchange rate regime (column 3) are never significant. If this estimation was correct, the exchange rate regime would not influence the link between booms in assert prices and capital inflows.

When it comes to the quality of institutions the evidence provided by these estimations is also weak. The interaction of capital inflows and the quality of institutions is not statistically significant, except for portfolio debt. The association between debt portfolio inflows and booms in real stock prices is lower the higher the quality of the economy´s institutions.

Finally, when we include all the interactions in the same regression (column 5), the results indicate that the only two factors that influence the degree of association between capital inflows and booms are the level of financial development and the degree of financial openness. The only significant coefficients in column 5 correspond to the interaction between portfolio equity and financial depth, and the interaction of financial openness with other flows and portfolio debt.

The estimations presented in Table 7 suffer potential endogeneity problems. To control for potential endogeneity I now estimate equation (3.2) using instrumental

variables. The instruments that I use are the control variables (domestic factors) and external factors, such as the growth rate of World output, the interest rate from the US, and time dummies. I present this exercise, the final of the paper, in Table 8.

Once again, I find that *booms* in real stock prices are strongly associated with capital inflows, but composition matters. For example the association with FDI inflows is not statistically significant. In contrast, the association with debt portfolio inflows is positive, significant and robust. The positive association with other inflows is also significant and robust. For equity portfolio inflows the results are mixed but not robust.

Regarding the interactions, Table 8 shows that, when included individually, the coefficients are in general negative and significant, except for the exchange rate regime. Columns 1 and 2 display negative and significant coefficients for the interactions of financial depth and financial openness with all types of capital inflows except FDI. In column 4, quality of institutions is negative and significant when interacted with debt inflows (both portfolio and other). When combined in the same regression, as is done in column 5, the patterns of the interactions change slightly. While financial openness never emerges significant when interacted with capital inflows, the other three country characteristics are always negative and significant when interacted with of debt inflows.

D. Discussion of the results in light of previous works

Most of the findings are consistent with theory. Specifically, the results confirm previous theoretical findings that large capital inflows can potentially be linked to *booms* in real stock prices, particularly in countries with underdeveloped and poor regulated financial markets –low quality of institutions.

The results are also consistent with the empirical literature. In particular the findings that debt flows are the more dangerous type of capital. Tong and Wei (2010) show that the volume of total capital flows has no significant effect on the severity of stock market declines, but that the composition matters: large pre-crisis exposure to debt inflows tends to be associated with a more severe decline in stock prices during the crisis. This paper suggests an explanation for Tong and Wei (2010)´s result –that there a more severe decline in stock prices after debt flows- since it shows that debt flows are more likely to have been

involved in the development of a *boom* in stock prices before the crisis. The findings in this paper also provide some evidence that what links debt flows with booms in asset prices is the ability of the financial sector to intermediate the debt flows. But it could also be the case that debt flows are not being intermediated through the financial system and directly buying government bonds. If this is the case, the impact to real stock prices would be through the interest rate. Although analyzing this transmission channel is out of the scope of this paper, I provide evidence that this can potentially be the case in Table 9. Table 9 shows that debt related inflows are negatively related to interest rates on government bonds, and since interest rates are negatively related to stock prices, it may be the case that the association with booms in stock prices is through the interest rate. However, to support this argument more evidence is required and is an area for future research.

A perhaps surprising result is that higher capital controls (less financial openness) do not appear to reduce the probability of large capital inflows being associated with *booms* in real asset prices. This result is robust; it holds in all estimations. But it goes against previous theoretical findings (see Korinek, 2010). The story told, at least, since Diaz-Alejandro in "Goodbye financial repression, hello financial crash", is that when emerging economies open up to financial markets, they increase the probability of asset price *bubbles* and financial crisis. However, the result is consistent with other empirical works. For example Edwards (2011) finds that capital controls are an ineffective tool for isolating countries from global financial shocks. The intuition of why capital controls may not be useful to reduce the association between capital inflows and booms is found in Kamisnky and Schmukler (2008). Kamisnky and Schmukler show that financial deregulation creates forces that favor more efficient financial markets over the long run, such as improvements in institutions and accountability of investors. In the long run, financial liberalization promotes more stable financial markets and growth. It is true, however, that in the short run financial liberation may still trigger *booms* (and subsequent *busts*) in economies with distortions in capital markets as protected domestic financial institutions obtain access to new funds. In light of the evidence presented in this paper, these developments are more likely related to the degree of financial development and quality of institutions than to lower regulation of capital flows.

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IV. FINAL REMARKS

As a consequence of the global financial crisis, policy makers are reassessing regulatory policies to reduce systemic vulnerabilities and costly financial crises. A key lesson we learned from the crisis is that wrong macroeconomic policy, weak regulation and market failures pose a great risk to financial stability. In this context this paper makes a significant contribution for policy analysis; it contributes to our understanding of the role institutions and policies can play in moderating the vulnerabilities associated with large capital inflows. The paper´s findings can, potentially, help policymakers choose the appropriate policy options to handle large capital flows.

A major implication of this paper is that capital inflows, in particular debt related inflows, are associated with *booms* in asset prices; and, therefore, can potentially increase the risk of financial crisis. Nonetheless, there are some factors that can help reduce this association. Consider as an example the prescription given in a recent IMF paper by Ostry et al. (2011). Ostry et al. (2011) claim countries "may have incentives to establish administrative controls to capital inflows if they increase the risk of financial distress." Since financial distress is one of the (undesired) consequences of *booms* in asset price (see Kaminsky and Reinhart, 1999), one could reinterpret this claim as: *if capital inflows were found to be associated with booms in asset prices, policymakers may have incentives to establish capital controls*. This inquiry can, in part, be answered by the findings of this paper.

If this paper is any guide, capital controls –implying a lower degree of financial openness- do not contribute to reduce the association between capital inflows and *booms* in asset prices. Although they may be useful for other reasons, capital controls will not be able to prevent capital inflows from increasing the vulnerabilities in domestic financial markets created by *booms* in asset prices. In fact the introduction of capital controls may help amplify financial market imperfections and should, therefore, be used with care.

Moreover, the findings in this paper suggest countries should improve the quality of their institutions and regulations, and adopt more flexible exchange rates before making use of capital controls; evidence suggests they are a more efficient tool to handle large and volatile capital inflows.

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Figure 1: Association between real asset prices and capital inflows vs the level of development

$y = -3.5488x + 9.9563$
$R^2 = 0.4903$

GDP per capita (in logs)

Association between real appreciation of asset pricess and net capital inflows
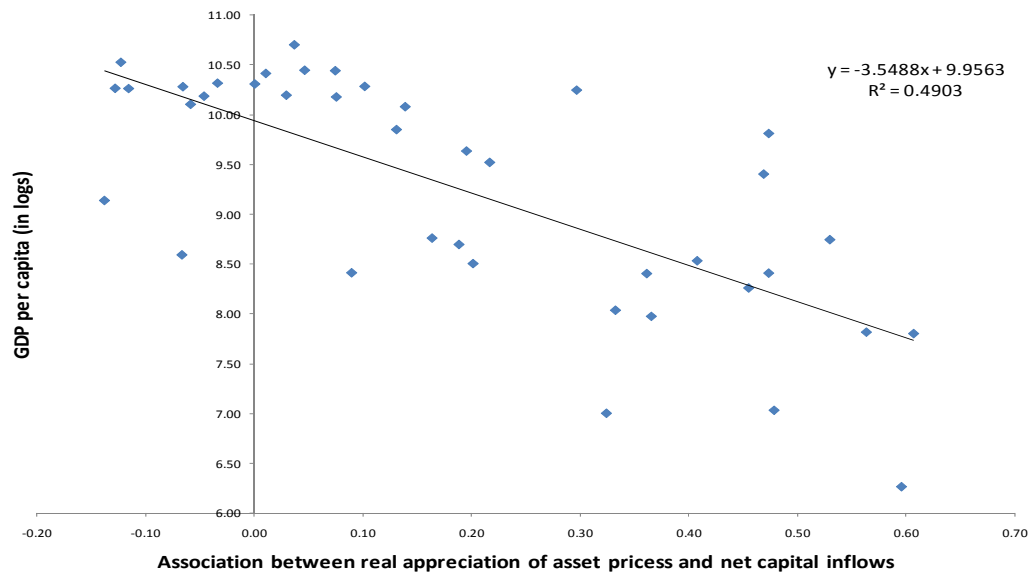
Figure 2: Association between real asset prices and capital inflows vs the level of financial development

$y = -3.5683x + 5.7842$
$R^2 = 0.1771$

Financial Depth (in logs)

Associations between real asset prices and capital inflows
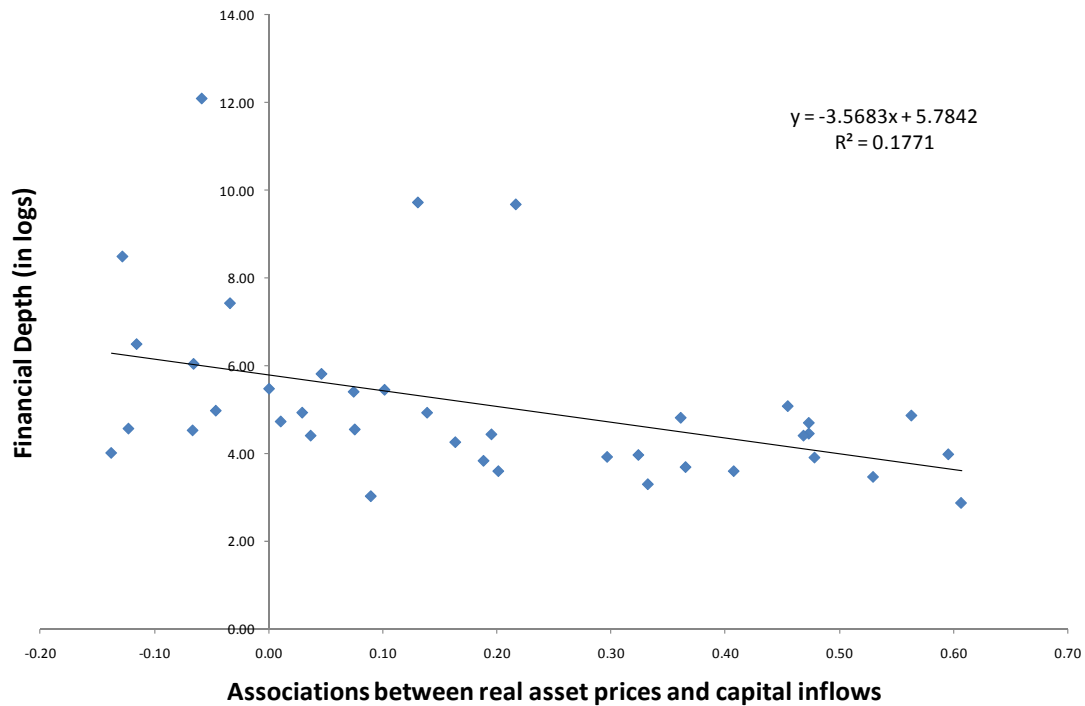
Figure 3: Association between real asset prices and capital inflows vs the level of financial openness

y = -3.335x + 1.8238
R² = 0.3607

Financial Openness (Chinn and Ito)

Association between real asset prices and capital inflows
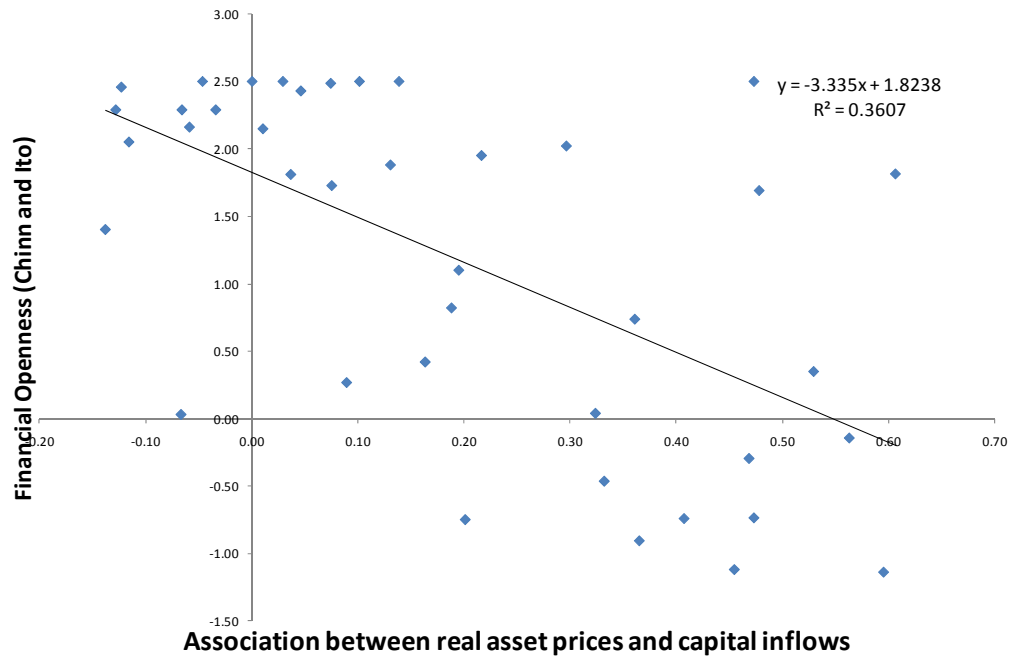
Figure 4: Association between real asset prices and capital inflows vs the quality of institutions

y = -3.7828x + 5.3225
R² = 0.4395

Quality of institutions

Association between real asset prices and capital inflows
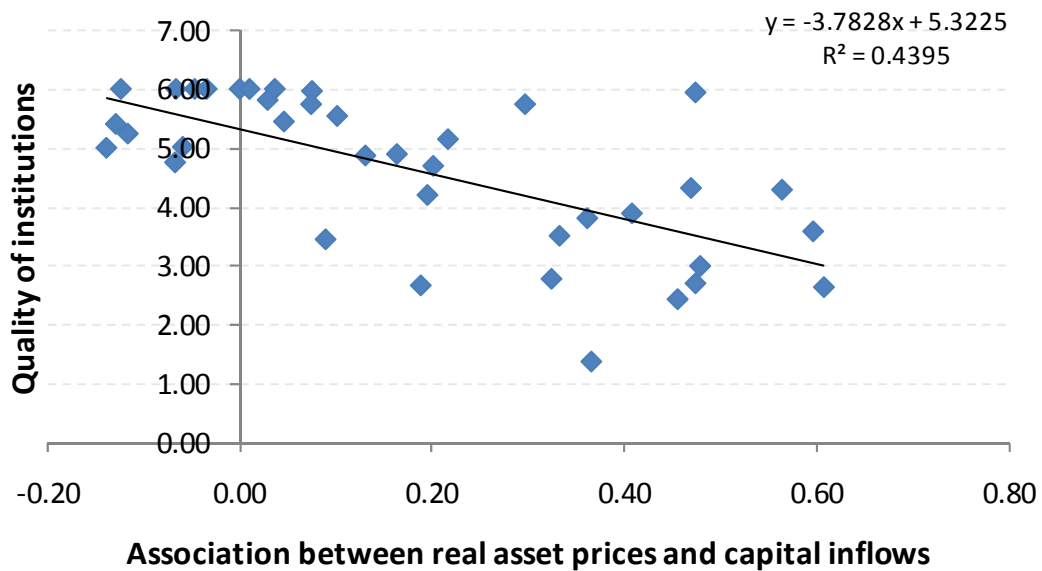
Figure 5: Association between real asset prices and capital inflows vs the exchange rate regime

$$y = 1.7581x + 2.4835$$
$$R^2 = 0.1596$$

Exchange rate regime (y-axis)

Association between real asset prices and capital inflows (x-axis)
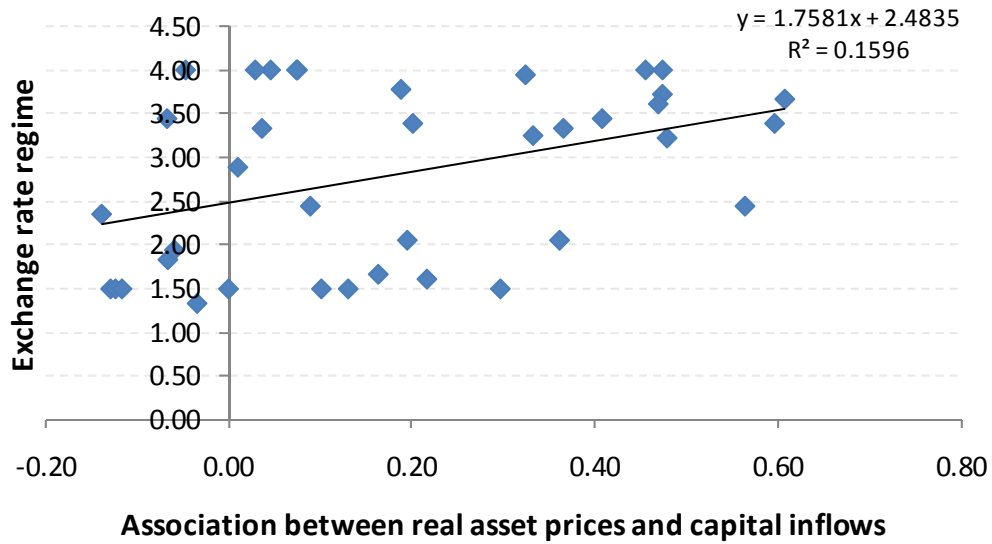
Figure 6: Association between real asset prices and different categories of Capital Inflows

FDI   Other   Portfolio Debt   Portfolio Equity
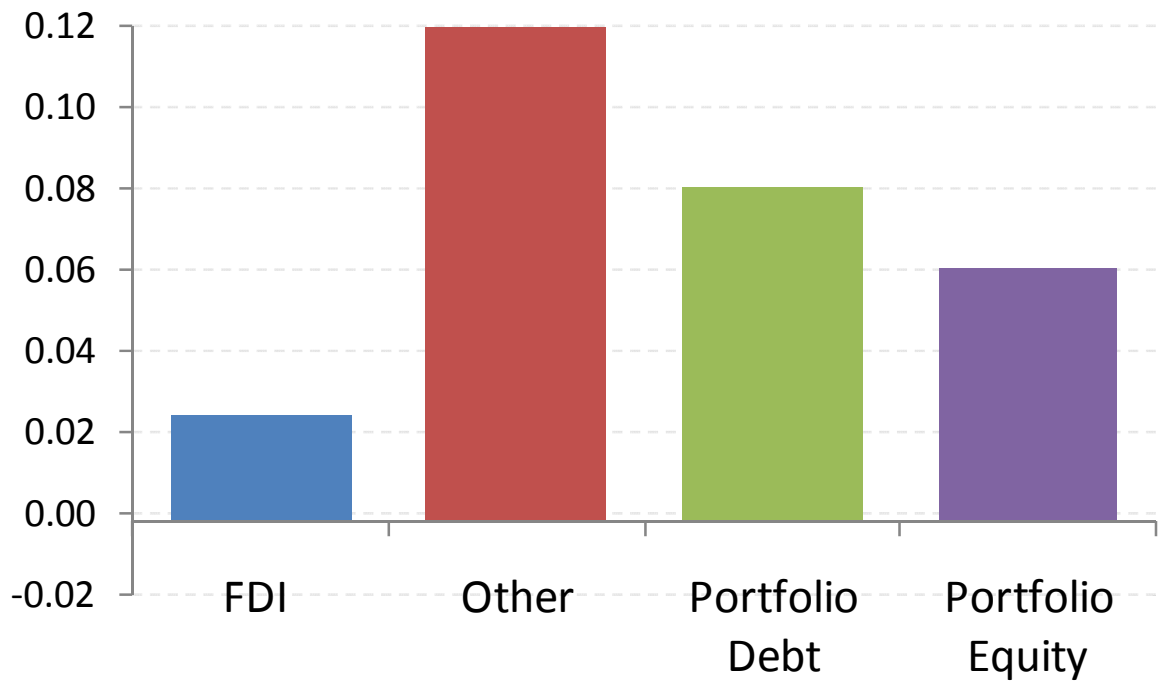
Figure 7: Examples of *Booms* in real stock prices
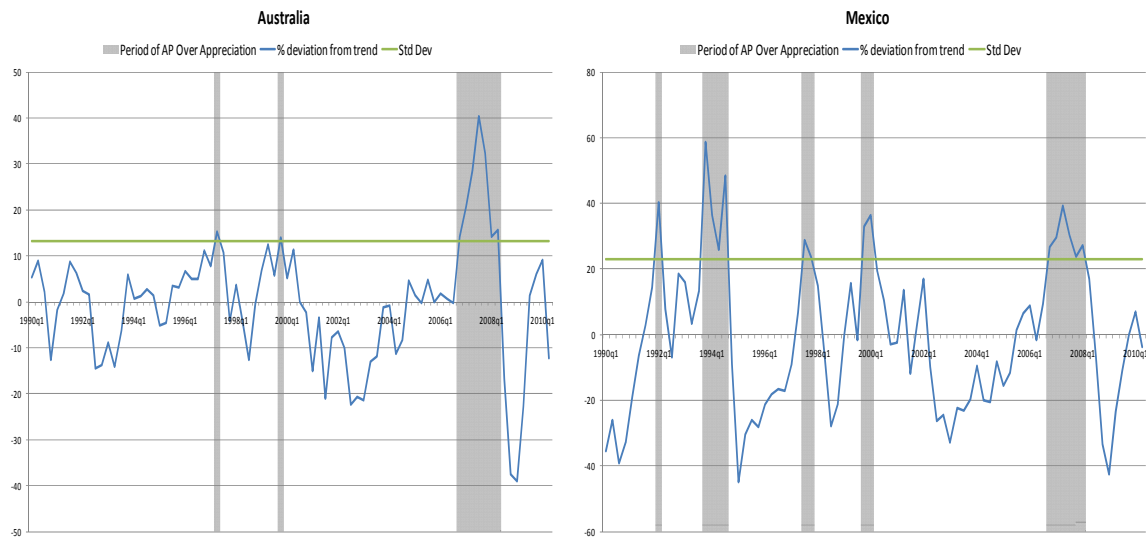
Table 1: Sample of Countries

Emerging Economies		Developed Economies		
Argentina	Mexico	Australia	Ireland	United States
Brazil	Peru	Austria	Italy	
Chile	Philippines	Belgium	Japan	
Colombia	Poland	Canada	Netherlands	
Hong Kong SAR	Russia	Czech Republic	New Zealand	
Hungary	South Africa	Denmark	Norway	
India	Thailand	Finland	Portugal	
Indonesia	Turkey	France	Spain	
Korea	Venezuela	Germany	Sweden	
Malaysia		Greece	United Kingdom	

Table 2: Data Definition and Sources

Capital inflows	Description	Source
FDI Inflows	Foreign Direct Investment (Liab.)	IFS
FDI Outflows	Foreign Direct Investment abroad	IFS
Equity Inflows	PI Equity Securities (liab.)	IFS
Equity Outflows	PI Equity Securities (ass.)	IFS
Debt inflows	PI Debt Securities (liab.)	IFS
Debt Outflows	PI Debt Securities (ass.)	IFS
Other Inflows	Other Investment Liab. NIE	IFS
Other Outflows	Other Investment Assets	IFS
Stock Price Index	MSCI in LCU	Bloomberg
Nominal GDP	Annual GDP in US$ dollars	WEO (2011)
Inflation	Growth rate of CPI (end of the period)	IFS
Real GDP	Quarterly real GDP	IFS
Echange Rate Regime	Reinhart and Rogoff Classification (2008)	Reinhart´s Web-page
Financial Openness	Chinn and Ito (2010)	
Quality of Institutions	Scores of Law & Order	International Country Risk Guide (ICRG)

Table 3: Summary Statistics and unit Root Tests Real Stock Prices Appreciation

Country	MSCI Index/CPI (Appreciation)			MSCI Index/CPI (HP filtered)		
	obs.	avg.	p-value*	obs.	avg.	p-value*
Argentina	81	4.47	0.000	82	-2.76	0.011
Australia	81	1.32	0.000	82	-0.44	0.010
Austria	61	0.65	0.000	62	-1.79	0.200
Belgium	61	0.62	0.000	62	-1.35	0.276
Brazil	81	6.50	0.000	82	-1.45	0.000
Canada	81	1.64	0.000	82	-0.43	0.025
Chile	81	3.12	0.000	56	-1.41	0.004
Colombia	70	4.18	0.000	71	-3.35	0.040
Czech Republic	62	2.97	0.000	63	-1.14	0.066
Denmark	81	1.67	0.000	82	-0.68	0.064
Finland	61	3.57	0.000	62	3.06	0.000
France	61	1.21	0.000	62	-0.89	0.138
Germany	61	1.50	0.000	62	-1.23	0.110
Greece	46	-1.38	0.000	47	-2.42	0.434
Hong Kong SAR	81	2.17	0.000	82	-0.60	0.001
Hungary	62	4.25	0.000	63	-2.02	0.081
India	70	2.95	0.000	71	-0.84	0.033
Indonesia	81	2.48	0.000	82	-3.41	0.011
Ireland	61	-0.64	0.000	62	-2.10	0.230
Italy	61	0.53	0.000	62	-0.97	0.132
Japan	81	-0.34	0.000	82	-0.44	0.031
Korea	81	2.59	0.000	82	-1.04	0.012
Malaysia	81	1.80	0.000	82	-1.17	0.020
Mexico	81	4.10	0.000	82	-1.14	0.005
Netherlands	61	1.14	0.000	62	-1.11	0.153
New Zealand	81	0.06	0.000	82	-1.37	0.037
Norway	81	0.92	0.000	82	-0.91	0.022
Peru	70	4.19	0.000	69	-1.72	0.018
Philippines	81	1.52	0.000	82	-2.47	0.000
Poland	70	5.25	0.000	71	-1.54	0.002
Portugal	61	0.92	0.000	62	-1.30	0.135
Russia	61	9.41	0.000	62	-2.06	0.047
Singapore	81	1.44	0.000	82	-0.72	0.015
South Africa	70	2.36	0.000	71	-1.28	0.006
Spain	61	2.38	0.000	62	-1.26	0.071
Sweden	81	2.63	0.000	82	-0.74	0.020
Thailand	81	1.69	0.000	82	-3.02	0.013
Turkey	81	4.44	0.000	82	-1.78	0.001
United Kingdom	81	0.63	0.000	82	-0.55	0.051
United States	81	1.10	0.000	82	-0.45	0.058
Venezuela	70	2.01	0.000	71	-0.65	0.005

* Mackinnon approximate p-value from the Augmented Dickey-Fuller Test under the null of unit-root

Table 4: Summary Statistics and Unit Root Tests for Net Capital Inflows

Country	Total Net Inflows				Net FDI				Net Portfolio Inflows				Net Other Inflows			
	obs.	avg.	s.d.	p-value*	obs.	avg.	s.d.	p-value*	obs.	avg.	s.d.	p-value*	obs.	avg.	s.d.	p-value*
Argentina	83	-0.04	1.91	0.005	83	0.49	0.65	0.000	83	0.15	1.51	0.000	83	-0.69	1.29	0.000
Australia	78	1.08	0.63	0.000	78	0.22	0.74	0.000	78	0.75	1.23	0.000	78	0.12	0.79	0.000
Austria	83	0.08	1.05	0.000	83	-0.09	0.63	0.000	83	0.35	1.49	0.000	83	-0.19	1.69	0.000
Belgium	35	-0.34	1.20	0.000	35	0.42	2.26	0.000	35	-0.16	3.41	0.000	35	-0.60	3.55	0.000
Brazil	83	0.52	0.86	0.000	83	0.43	0.46	0.000	83	0.37	0.86	0.000	83	-0.29	0.84	0.000
Canada	83	0.01	0.75	0.000	83	-0.08	0.67	0.000	83	0.17	1.04	0.000	83	-0.09	0.87	0.000
Chile	79	0.58	1.60	0.000	79	0.94	0.88	0.000	79	-0.55	1.22	0.000	79	0.19	1.40	0.000
Colombia	59	0.68	0.62	0.000	59	0.61	0.40	0.001	79	0.01	0.40	0.000	59	0.06	0.59	0.000
Czech Republic	62	1.49	1.48	0.000	62	1.29	1.23	0.000	62	0.03	0.88	0.000	62	0.17	1.38	0.000
Denmark	83	-0.14	1.64	0.000	83	-0.11	0.84	0.000	83	-0.28	2.59	0.000	83	0.25	2.54	0.000
Finland	83	-0.36	1.78	0.000	83	-0.34	1.37	0.000	83	-0.02	2.29	0.000	83	0.00	2.48	0.000
France	83	-0.14	0.89	0.000	83	-0.49	0.73	0.000	83	0.03	1.61	0.000	83	0.32	1.55	0.000
Germany	83	-0.45	1.09	0.000	83	-0.20	0.94	0.000	83	0.15	1.43	0.000	83	-0.40	1.40	0.000
Greece	79	1.49	1.35	0.000	79	0.10	0.28	0.000	79	0.82	1.98	0.000	79	0.57	2.28	0.000
Hong Kong SAR	47	-1.89	3.79	0.000	48	0.06	2.99	0.000	47	-3.12	6.80	0.000	47	1.17	8.53	0.000
Hungary	83	1.77	1.96	0.000	83	1.00	1.24	0.000	83	0.52	1.48	0.000	83	0.25	1.71	0.000
India	53	0.77	0.63	0.002	73	0.17	0.14	0.001	53	0.21	0.32	0.002	81	0.35	0.43	0.000
Indonesia	78	0.01	1.19	0.000	81	0.11	0.37	0.003	78	0.13	0.66	0.000	80	-0.22	0.71	0.000
Ireland	83	0.03	2.87	0.000	83	0.33	3.30	0.000	83	-1.25	6.47	0.000	83	0.96	6.71	0.000
Italy	83	0.20	0.58	0.000	83	-0.11	0.32	0.000	83	0.37	1.13	0.000	83	-0.06	1.20	0.000
Japan	83	-0.46	0.52	0.000	83	-0.19	0.16	0.000	83	-0.22	1.06	0.000	83	-0.05	1.09	0.000
Korea	83	0.33	0.87	0.000	83	-0.06	0.23	0.001	83	0.34	0.67	0.000	83	0.06	0.93	0.000
Malaysia	45	-1.58	2.78	0.000	45	0.05	0.74	0.000	45	-0.12	2.10	0.000	45	-1.51	1.92	0.000
Mexico	75	0.92	0.74	0.000	75	0.52	0.31	0.000	83	0.30	0.83	0.000	83	-0.01	0.59	0.000
Netherlands	83	-0.80	1.43	0.000	83	-0.72	2.68	0.000	83	-0.22	3.27	0.000	83	0.14	2.39	0.000
New Zealand	82	1.08	1.44	0.000	82	0.64	1.01	0.000	82	0.21	1.41	0.000	82	0.22	1.43	0.000
Norway	75	-1.86	2.01	0.000	75	-0.42	0.99	0.000	75	-1.67	3.21	0.000	75	0.23	3.35	0.000
Peru	78	0.95	1.18	0.000	78	0.82	0.73	0.000	78	0.09	0.59	0.000	78	0.03	0.93	0.000
Philippines	83	0.89	1.60	0.000	83	0.32	0.43	0.000	83	0.25	0.87	0.000	83	0.32	1.34	0.000
Poland	65	0.73	1.90	0.000	65	0.52	0.54	0.000	65	0.29	0.74	0.000	65	-0.07	1.70	0.000
Portugal	83	1.37	1.36	0.000	83	0.15	0.75	0.000	83	0.28	2.17	0.000	83	0.94	2.40	0.000
Russia	67	-0.72	1.95	0.000	67	0.06	0.30	0.000	67	-0.01	0.81	0.000	67	-0.76	1.74	0.000
Singapore	60	-2.90	2.28	0.000	60	1.43	2.33	0.000	60	-2.61	1.72	0.019	60	-1.72	3.67	0.000
South Africa	83	0.54	0.92	0.000	83	0.17	1.20	0.000	83	0.39	1.28	0.000	83	-0.02	0.93	0.000
Spain	83	0.86	1.01	0.008	83	-0.21	0.77	0.000	83	0.61	1.99	0.000	83	0.45	1.75	0.000
Sweden	83	-0.28	1.78	0.000	83	-0.16	2.03	0.000	83	-0.46	2.43	0.000	83	0.33	2.31	0.000
Thailand	78	0.44	2.20	0.004	82	0.65	0.45	0.001	78	0.17	0.76	0.000	82	-0.30	2.30	0.046
Turkey	83	0.62	1.23	0.000	83	0.22	0.30	0.000	83	0.12	0.58	0.000	83	0.29	0.87	0.000
United Kingdom	83	0.44	1.04	0.000	83	-0.37	1.87	0.000	83	0.54	2.87	0.000	83	0.27	2.16	0.000
United States	83	0.73	0.56	0.000	83	-0.05	0.30	0.000	83	0.64	0.62	0.000	83	0.14	0.42	0.000
Venezuela	67	-1.29	1.89	0.000	67	0.33	0.72	1.120	67	-0.06	0.85	0.000	67	-1.56	1.44	0.000

* Mackinnon approximate p-value from the Augmented Dickey-Fuller Test under the null of unit-root

Table 5: Estimation of *Booms* in Real Asset Prices

Methodology: OLS with country fixed effects
Dependent Variable: Booms in real asset prices

Variables	(1) All Countries	(2) Emerging countries only	(3) Advanced countries only
FDI Inflows (% GDP)	0.006*	0.005	-0.004
	[1.668]	[1.006]	[-0.669]
Other Inflows (% GDP)	0.008***	0.009***	0.001
	[3.611]	[3.616]	[0.201]
Equity Inflows (% GDP)	0.009***	0.012***	0.000
	[2.991]	[2.993]	[0.057]
Debt Portfolio Inflows (% GDP)	0.008***	0.011***	-0.002
	[2.828]	[3.024]	[-0.464]
Growth rate of real GDP	0.001*	0.001	-0.004*
	[1.746]	[1.369]	[-1.709]
Growth rate of Govvernment Expenditures	0.000	0.000	-0.000
	[0.116]	[0.276]	[-0.226]
Inflation (CPI)	-0.000	0.002	-0.011
	[-0.065]	[1.471]	[-1.343]
Constant	-0.003	-0.009	0.024
	[-0.104]	[-0.214]	[0.514]
Observations	1,866	1,015	851
Number of ncode	36	17	19

z-statistics in brackets
*** p<0.01, ** p<0.05, * p<0.1

Table 6: Instrumental Variable estimation of *Booms* in Real Asset Prices

Methodology: Instrumental variables
Dependent Variable: Booms in real asset prices

Variables	(1) All Countries	(2) Emerging Only	(3) Developed Only
FDI Inflows (% GDP)	-0.004	0.006	-0.006
	[-0.325]	[0.339]	[-0.393]
Other Inflows (% GDP)	-0.001	0.002	0.009
	[-0.098]	[0.197]	[0.586]
Equity Inflows (% GDP)	0.017*	-0.004	0.004
	[1.698]	[-0.264]	[0.268]
Debt Portfolio Inflows (% GDP)	0.044***	0.063***	0.017
	[4.969]	[5.373]	[1.142]
Growth rate of real GDP	0.005***	0.005***	0.005*
	[4.780]	[4.515]	[1.877]
Growth rate of Govvernment Expenditures	-0.000	-0.000	-0.001
	[-0.623]	[-0.806]	[-0.858]
Inflation (CPI)	0.002	0.003*	-0.002
	[1.264]	[1.793]	[-0.227]
Constant	0.056***	0.052***	0.053***
	[7.647]	[4.653]	[3.883]
Observations	1,702	912	790
Number of ncode	36	17	19

z-statistics in brackets
*** p<0.01, ** p<0.05, * p<0.1

Table 7: Estimating the determinants of *booms* in real asset prices

Estimation Methodology: Panel with fixed Effects (xtreg)
Dependent Variable: Booms in real MSCI index

	(1) Fin Depth		(2) KAOPEN		(3) ExRate Regime		(4) Inst. Quality		(5) All Intercations	
Capital Inflow Variables										
NET FDI % GDP	0.025	[0.799]	0.016**	[2.197]	0.017	[1.561]	0.028	[1.559]	0.008	[0.198]
NET Other % GDP	0.032**	[2.084]	0.017***	[4.147]	0.012	[1.548]	0.017	[1.532]	0.013	[0.623]
NET Equity % GDP	0.109***	[2.971]	0.023**	[2.487]	0.011	[1.123]	0.039**	[1.984]	0.089*	[1.801]
NET Debt % GDP	0.045***	[2.584]	0.031***	[4.626]	0.016*	[1.853]	0.039***	[2.959]	0.050**	[2.000]
Control Variables										
Growth rate or real GDP	0.005***	[4.964]	0.005***	[4.878]	0.005***	[4.696]	0.005***	[5.384]	0.005***	[4.927]
Inflation (CPI)	0.001	[0.580]	0.002	[1.349]	0.000	[0.177]	0.001	[0.763]	0.003	[1.568]
Growth rate of Gov Exp	-0.000	[-1.065]	-0.000	[-0.888]	-0.000	[-0.974]	-0.000	[-1.084]	-0.000	[-0.617]
Financial Depth	0.042**	[2.338]							0.060***	[2.995]
Finacial Openness (Chinn-Ito)			0.002	[0.359]					0.001	[0.152]
Exchange Rate Ragime (Reinhart-Rogoff)					0.023***	[3.076]			0.022***	[2.787]
Institutional Quality							0.007	[1.027]	0.002	[0.307]
Interactions										
Net FDI * Financial Depth	-0.003	[-0.482]							0.002	[0.225]
Net Other * Financial Depth	-0.004	[-1.284]							-0.000	[-0.120]
Net Portfolio Equity * Financial Depth	-0.020**	[-2.578]							-0.016*	[-1.942]
Net Portfolio Debt* Financial Depth	-0.006*	[-1.718]							-0.002	[-0.413]
Net FDI * KAOPEN			-0.006*	[-1.839]					-0.003	[-0.705]
Net Other * KAOPEN			-0.005**	[-2.520]					-0.006**	[-2.171]
Net Portfolio Equity * KAOPEN			-0.008*	[-1.893]					-0.002	[-0.282]
Net Portfolio Debt* KAOPEN			-0.010***	[-3.362]					-0.009**	[-2.041]
Net FDI * Exchange Rate Regime					-0.002	[-0.530]			-0.002	[-0.420]
Net Other * Exchange Rate Regime					0.002	[0.653]			0.000	[0.127]
Net Portfolio Equity * Exchange Rate Regim					0.002	[0.571]			0.004	[0.865]
Net Portfolio Debt* Exchange Rate Regime					0.001	[0.229]			-0.001	[-0.429]
Net FDI * Institutional Quality							-0.004	[-1.188]	0.001	[0.143]
Net Other * Institutional Quality							-0.002	[-0.679]	0.002	[0.630]
Net Portfolio Equity * Institutional Quality							-0.006	[-1.484]	-0.001	[-0.083]
Net Portfolio Debt * Institutional Quality							-0.006**	[-2.111]	-0.001	[-0.225]
Constant	-0.145*	[-1.728]	0.045***	[4.516]	-0.022	[-0.864]	0.015	[0.479]	-0.314***	[-3.039]
Observations	1,703		1,715		1,611		1,854		1,565	
R-squared	0.039		0.041		0.037		0.034		0.055	
Number of ncode	36		36		36		36		36	

t-statistics in brackets
*** p<0.01, ** p<0.05, * p<0.1

Table 8: Estimating the determinants of *booms* in real asset prices using instrumental variables

Methodology: instrumental Variables

Dependent Variable: Booms in Real MSCI prices

	(1) Fin Depth		(2) KAOPEN		(3) ExRate Regime		(4) Inst. Quality		(5) All Intercations	
Capital Flows Variables:										
NET FDI % GDP	0.176	[1.167]	0.040	[1.213]	0.025	[0.557]	0.016	[0.195]	0.079	[0.358]
NET Other % GDP	0.365***	[5.118]	0.037**	[2.559]	-0.016	[-0.477]	0.099**	[2.275]	0.501***	[3.978]
NET Equity % GDP	0.380**	[1.999]	-0.092*	[-1.925]	-0.012	[-0.361]	0.037	[0.369]	0.348	[1.202]
NET Debt % GDP	0.260***	[3.369]	0.127***	[3.903]	0.027	[0.834]	0.318***	[4.896]	0.510***	[4.232]
Control Variables:										
Growth rrate of GDP	0.005***	[4.268]	0.004***	[3.751]	0.005***	[4.922]	0.004***	[4.165]	0.005***	[4.086]
Inflation (CPI)	0.007***	[3.097]	0.005**	[2.075]	0.002	[1.040]	0.004*	[1.816]	0.006***	[2.665]
Growth rate of Gov Exp	-0.000	[-0.037]	-0.000	[-0.162]	-0.000	[-1.236]	0.000	[0.228]	-0.000	[-0.075]
Financial Depth	0.101***	[3.896]							0.138***	[4.443]
Financial openness (Chinn-Ito)			0.006	[0.465]					-0.028**	[-2.498]
Exchange rate regime (Reinhart-Rogoff)					0.023**	[2.531]			0.036***	[3.574]
Institutional quality							-0.013	[-1.105]	-0.007	[-0.687]
Interactions:										
Net FDI * Financial Depth	-0.037	[-1.143]							0.001	[0.028]
Net Other * Financial Depth	-0.074***	[-4.929]							-0.062***	[-4.100]
Net Portfolio Equity * Financial Depth	-0.077**	[-1.969]							-0.042	[-1.052]
Net Portfolio Debt* Financial Depth	-0.053***	[-3.296]							-0.067***	[-4.216]
Net FDI * KAOPEN			-0.012	[-1.046]					0.000	[0.015]
Net Other * KAOPEN			-0.012**	[-2.193]					0.001	[0.261]
Net Portfolio Equity * KAOPEN			0.039**	[2.100]					0.008	[0.660]
Net Portfolio Debt* KAOPEN			-0.048***	[-3.550]					0.012	[1.639]
Net FDI * Exchange Rate Regime					-0.004	[-0.285]			-0.018*	[-1.695]
Net Other * Exchange Rate Regime					0.010	[1.007]			-0.028***	[-3.359]
Net Portfolio Equity * Exchange Rate Regim					0.009	[0.774]			-0.018*	[-1.794]
Net Portfolio Debt* Exchange Rate Regime					-0.002	[-0.235]			-0.025***	[-3.562]
Net FDI * Institutional Quality							-0.003	[-0.212]	-0.005	[-0.501]
Net Other * Institutional Quality							-0.019**	[-2.184]	-0.024**	[-2.516]
Net Portfolio Equity * Institutional Quality							-0.007	[-0.379]	-0.019	[-0.878]
Net Portfolio Debt * Institutional Quality							-0.059***	[-4.791]	-0.027**	[-2.457]
Constant	-0.433***	[-3.484]	0.031	[1.319]	-0.024	[-0.782]	0.108*	[1.771]	-0.644***	[-4.031]
Observations	1,664		1,702		1,594		1,691		1,553	
Number of ncode	36		36		36		36		36	

z-statistics in brackets

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

Table 9: Estimating the association of different types of capital inflows with interest rates
Methodology: Panel with fixed effects
Dependent Variable: Interest rate on T-bills

VARIABLES	(1) All Countries	(2) Emerging Only	(3) Developed Only
NET FDI % GDP	-0.444	-1.096	0.288**
	[-1.356]	[-1.371]	[2.042]
NET Other % GDP	-0.805***	-1.379***	-0.026
	[-3.634]	[-2.944]	[-0.255]
NET Equity % GDP	-0.612	-1.197	0.160
	[-1.327]	[-1.285]	[1.076]
NET Debt % GDP	-0.831***	-1.277**	-0.141
	[-3.211]	[-2.106]	[-1.261]
Constant	10.439***	17.629***	5.573***
	[4.521]	[3.190]	[9.961]
Observations	1,680	616	1,064
Number of ncode	28	11	17

z-statistics in brackets

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

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