INTERNATIONAL MONETARY FUND

# Fueling or Following Growth?

## Causal Effects of Capital Inflows On Recipient Economies

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**WP/24/15**



**2024**
JAN

WORKING PAPER

 WP/24/15

**IMF Working Paper**
Strategy, Policy, and Review Department

# Fueling or following growth?
# Causal effects of capital inflows on recipient economies

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Authorized for distribution by Azim M. Sadikov
January 2024



**ABSTRACT:** Identifying the causal impact of capital inflows on growth and development has been a perennial challenge. This paper proposes a new way to investigate the effect of capital flows on recipient emerging and developing economies, using shift-share instruments and correcting for indirect flows. It finds a significantly beneficial effect of loan and bond inflows on economic performance, which materializes after a few years. It also finds some confirmation that the absorptive capacity of recipient economies depends on their fundamentals.

**RECOMMENDED CITATION:** End, Nicolas (2024), "Fueling or following growth? Causal effects of capital inflows on recipient economies" *IMF Working Paper* 24/15.

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|---|---|
| JEL Classification Numbers: | E44, F21, F30 |
| Keywords: | Capital flows; economic growth; shift-share instrument |
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[1] The author is indebted to T. Onoda (Japan Bank for International Cooperation—JBIC), who participated in this research. The author would also like to thank, without implication: Y. Kikuchi, M. Araki (both JBIC), D. Velculescu, and A. Sadikov (both IMF) for their support and feedback; Xiang Gao for the invaluable comments provided at the 2nd CEPR Rising Asia workshop in July 2022, as well as all other participants in that workshop; and Samson Kwalingana, Federico Grinberg, Paula Beltran Saavedra, and other IMF colleagues for their review. All remaining errors are my own.

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## Glossary

| | |
|---|---|
| BIS | Bank of international settlement |
| BoP | Balance of payment |
| CBS | BIS 's Locational Banking Statistics |
| CDIS | IMF's Coordinated direct investment survey |
| CEPR | Centre for economic policy research |
| CPI | Consumer price index |
| CPIS | IMF's Coordinated portfolio investment survey |
| EMDE | Emerging market and developing economy |
| ETF | Exchange traded fund |
| FDI | Foreign direct investment |
| Fed | Federal reserve board |
| GDP | Gross domestic product |
| IMF | International monetary fund |
| IFS | IMF's International financial statistics |
| IIP | International investment position |
| IV | Instrumental variable |
| JBIC | Japan bank of international cooperation |
| JEL | Journal of economic literature |
| LBS | BIS 's Locational banking statistics |
| NBER | National bureau of economic research |
| NPL | Nonperforming loan |
| OLS | Ordinary least squares |
| RBEP | Restated bilateral external portfolios |
| TIC | Treasury's international capital |
| TSLS | Two-stage least square |
| USD | U.S. dollar |
| VAR | Vector auto-regressive |
| VIX | Chicago board options exchange's volatility index |

# 1. Introduction

With the world's gross external liabilities hovering above 200% of global GDP for more than a decade, countries, especially emerging markets and developing economies (EMDEs), are thought to be vulnerable to capital flow shocks. This vulnerability is heightened as the central banks of the major economies are unwinding their accommodative monetary policy stance in the face of global inflationary pressures. In 2013, the Fed's unforeseen tapering announcement had a forceful impact on EMDEs' capital inflows (IMF, 2013; Lim et al., 2014). The current wave of monetary tightening may have similar consequences, even though communication has since improved.

The conventional wisdom is that capital inflows are beneficial to recipient economies as they help them grow and share risks, as they ease financial conditions and boost credit and domestic demand (Ostry et al., 2011; Blanchard et al., 2016). Consequently, countries have made efforts to attract capital flows—especially foreign direct investment (FDI). At the same time, they come with exposure to reversals, volatility, boom-bust cycles, and debt sustainability risks (Korinek, 2012; Rey, 2015; Reinhart et al., 2016; IMF, 2018). There are also concerns, typically in the developing world, about the adverse effects of capital flows (especially when they are volatile), and authorities in a number of countries have adopted a gradual approach to capital account liberalization and employ capital controls to limit capital flows (Fernández et al., 2016; IMF, 2021).

Yet, the magnitude of the causal impact of capital flow fluctuations have on recipient economies remains uncertain; the empirical literature is largely inconclusive, most of it leaving aside the question of causality. This paper attempts to fill this gap by investigating whether capital inflows have a positive, causal impact on the economic performance of recipients economies. It focuses on EMDEs, where the effects are quantitatively and possibly qualitatively different from developed countries and where the research question is more relevant to policymakers.

The contributions of the paper to the literature are twofold. First, it proposes a new empirical methodology to ascertain causality. Estimating the causal effect of capital flows is empirically challenging, mainly because of the potential for reverse causality: if capital inflows may propel recipient economies, booming economies are in turn more likely to attract investors' interest and capital. Therefore, even without a causal effect of capital flows on recipient economies, a positive correlation may arise between inflows and economic performance. There is also a possibility that

confounding factors, typically associated with global financial conditions, may influence both capital flows and recipient economies. I alleviate these concerns with an instrumental variable (IV) that is a shift-share instrument *à la* Bartik (1991), a common technique in the trade and labor literature that has recently become practically applicable in international finance, thanks to data on bilateral investment positions.

The second contribution is a rigorous examination of the impact of capital inflows for each main type of instrument—portfolio investment (differentiating between debt and equity), FDI, and "other investments" (a BoP category that mostly comprise cross-border loans). Not all capital flows have the same impact on recipient economies because they affect domestic financing conditions differently at a given monetary policy rate (Blanchard et al., 2016), and are associated with various risks Becker et al. (in terms of stability and governance 2007). Such a differential effect across types of capital flows is also expected as a result of uneven absorptive capabilities, especially where financial development is incomplete and capital market imperfections remain (Baharumshah et al., 2017; Copelovitch and Singer, 2017). Capital inflows may help overcome these imperfections and thus contribute to economic growth, but on the other hand shallow domestic financial markets may be ill-equipped to absorb the volatility associated with some types of foreign investment.

To shed light on the heterogeneous impact of capital flows, I leverage various bilateral flow databases. In particular, this paper is the first one to use for such analysis capital flow data that filter out the distorting effect of tax heavens, thanks to Coppola et al. (2021). This is important as otherwise the true nature and direction of capital flows could be masked by the presence of intermediaries.

I find that bond inflows and "other investment inflows" have a significantly positive effect on output and investment and that these effects take a few years to fully materialize. This result contrasts with Blanchard et al. (2017), who predict theoretically and find empirically that only non-bond flows have a positive impact on recipient economies, while bond inflows are contractionary. This may be caused by their smaller sample of 19 emerging markets, while I cover more than 80 countries, including less developed economies where financial markets may be less sophisticated, monetary policy transmission weaker, and macroeconomic policy responses different. Such policy responses typically depend on policymakers' objectives and underlying distortions in the economy. I also find some confirmation that the absorption capacity of recipient economies depends on their

fundamentals: public debt, interest rates, and financial development. My results are inconclusive with respect to FDI.

The rest of the paper is organized as follows. The next section reviews the existing theoretical and empirical literature. Section 3 details my empirical approach, while Section 4 presents my main results. Section 5 concludes with some implication for policies aiming at fostering capital flows. For readers' convenience, charts and regression tables are reported in appendix.

## 2. Related literature

In the short term, capital inflows affect the economy through two channels, as captured in the Mundell-Fleming model: currency appreciation and cheaper financing. The former effect is contractionary for net exports, whereas the latter is expansionary for investment and consumption (Blanchard et al., 2015). In the longer term, foreign investment is generally considered a driving factor for economic growth, especially in developing economies—an expectation founded theoretically in growth models. International financial flows are thought to accelerate capital accumulation in developing countries until the marginal product of capital in recipient countries is equalized to that of advanced economies, leading to transitional increases in economic growth. Yet, recent studies argue that, due to financial frictions, capital inflows may be misallocated to firms that are not necessarily the most productive and contribute to a slower economic growth (Reis, 2013; Gopinath et al., 2017). My paper focuses on the effects of capital flows in the short and medium terms.

There is an extensive empirical literature that links capital inflows to economic fluctuations in recipient economies. Using a large sample of countries over 50 years, Reinhart and Reinhart (2008) find that, economic activity initially accelerates during capital flow *bonanzas* (large capital inflow episodes), and then returns to pre-bonanza levels. Cardarelli et al. (2010) report a similar pattern for episodes of large net private capital inflows. A number of studies describe a correlation between capital inflows and credit growth (*e.g.*, Mendoza and Terrones, 2008, 2012; Magud et al., 2014). Also, there are several studies that differentiate the behavior of macroeconomic variables depending on the type of capital flows (Aizenman et al., 2011; Lane and McQuade, 2014; Calderón and Kubota, 2012; Caballero, 2012), while there is a number of papers that focus on specific inflows—development finance and aid (Addison et al., 2005; Rajan and Subramanian, 2008; Te Velde, 2011; Massa, 2011)

and FDI (Blomström et al., 2003; Li and Liu, 2005; Carkovic and Levine, 2005) attracted most attention.

Evidence of causality is relatively difficult to tease out, preventing a clear consensus from emerging. Blanchard et al. (2017) posit that bond inflows have less impact than non-bond inflows on financing costs as bond market conditions are primarily determined by monetary policy. They confirm this with a panel of emerging economies, instrumenting capital inflows with the interaction term of global flows to other emerging market countries and country fixed effects; namely, they find that bond flows have on average a small negative effect on output, while equity and other flows have a positive impact. However, Davis (2015) arrives at a different result: in his structural VAR analysis (where the VIX index and economic and financial conditions in global financial centers serve as external instruments), an exogenous increase in foreign debt causes a significant increase in the output gap, inflation, stock prices, and credit growth, as well as an appreciation of the exchange rate, equity-based capital flows have almost no statistically significant effect. Lane and McQuade (2014) also try to tackle the causality question with lagged international capital flows as IVs (although admitting weak IV concerns). They find that net debt inflows retain a significant effect on domestic credit growth in some specifications.

Using also a shift-share instrument based on bilateral capital flows, Sanders et al. (2020) finds that both equity and debt inflows are expansionary, although through different channels: equity inflows raise investment while debt inflows boost consumption. My approach extends Sanders et al. (2020) in two directions. First, it covers not only portfolio investment flows but also other types of capital flows. Second, it studies *effective* capital flows from actual investors to ultimate recipients, filtering out intermediaries, thanks to the dataset by Coppola et al. (2021) that restate flows with firms' ownership information. For example, 15 percent of equity flows from the United States into the United Kingdom in 2017 ultimately arrived into third countries (Coppola et al., 2021). Using this dataset has two advantages. First, it is expected to strengthen the shift-share IV as the distorting effect of tax havens disappears. Second, it corrects the breakdown between equity and debt flows and helps estimate the effects more accurately.[1]

[1]Some type of assets and liabilities appear as FDI in the IIP, but behave rather like portfolio investments. For example, when an offshore subsidiary of a Japanese firm issues bonds that it on-lends to the parent company, normal BOP statistics record it as FDI into Japan, while it effectively is a portfolio investment.

This paper also relates to Aldasoro et al. (2023), who study bank lending flows only, using the BIS's locational banking statistics (LBS). They report that granular instrumental variables *à la* Gabaix and Koijen (2020) are preferable to shift-share instruments based on LBS, as the latter are correlated with the global financial cycle. As granular IVs are best suited for high-frequency data, I address this concern by including time fixed effects in addition to shift-share IVs, which should filter out the business and financial cycles from my regressions. By using all publicly available data in the LBS, which is another difference from them, I find that shift-share IVs can remain strong enough even after controlling for fixed effects.

My empirical methodology is substantially different from Blanchard et al. (2017), who employ interaction terms between country fixed effects and global capital flows as IVs. In Blanchard et al. (2017), the number of IVs is thus as large as the number of countries, raising concerns about weak IV and material bias in the coefficients (Stock and Yogo, 2005; Montiel Olea and Pflueger, 2013). My methodology limits the number of IVs to one by exploiting heterogeneous shares of investors across recipients, and it is more robust to this concern.

# 3. Empirical approach

## 3.1. Instrumenting capital inflows

I set on assessing empirically the impact of capital inflows on recipient economies. My starting point is a reduced-form panel regression model:

$$\Delta U_{i,t} = \beta \frac{F_{\rightarrow i,t}}{Y_{i,t-1}} + \gamma_i + \gamma_t + \varepsilon_{i,t} \tag{1}$$

where $\Delta$ is the first difference operator, $U_{i,t}$ denotes the economic variable of interest in country $i$ period $t$ (*e.g.*, the logarithm of GDP, investment, export, import, or the exchange rate), $F_{\rightarrow i,t} \equiv \sum_{j \in W \setminus \{i\}} F_{j \rightarrow i,t}$ is the total investment flow into country $i$, which I scale by GDP, $Y$. $\gamma_i$ and $\gamma_t$ are the country and time fixed effects; $W$, and $T$ are the sets of countries and periods, respectively. The main coefficients of interest are the $\beta$ for each type of flow—equity, bond, FDI, and other investment (a component largely composed of flows into banks and foreign loans). I estimate this equation with a two-stage least square (TSLS) procedure and cluster standard errors by countries (Correia, 2018).

The main roadblock in estimating this model is the possibility of reverse causality. Capital flows can affect recipient economies, but conversely booming economies attract capital flows. Therefore, even if capital flows had no causal effect on growth or other economic indicators, they could still be positively correlated to them. More generally, investment flows are driven by both push (situation in investor countries or global factors) and pull (economic circumstances in recipient economies) factors (Fernandez-Arias, 1996). The existence of pull factors implies that $\mathbb{E}[F_{\rightarrow i,t}\varepsilon_{i,t}] \neq 0$; in other words, capital inflows cannot be considered exogenous. An ordinary least square (OLS) estimation of equation (1) would thus suffer from a bias in the causal effect ($\beta$).

To alleviate this concern, I extract a push factor and use it as instrument. The shift-share IVs, which has been frequently used in the trade and labor literature (Bartik, 1991), have recently become practically applicable to international finance. This is because data on bilateral investment positions have become available for relatively longer periods. Shift-share instruments based on bilateral investment positions are thought to be correlated with push factors in investor countries but exogenous to pull factors in the recipient economy.

Using the instrument based on bilateral investment positions in the model with investment flows requires some manipulations of the model. If $P_{\rightarrow i,t} \equiv \sum_{j \in W \setminus \{i\}} P_{j \rightarrow i,t}$ is the investment position in the form of $k$ of the rest of the world in $i$, $\Delta P_{\rightarrow i,t} = P_{\rightarrow i,t} - P_{\rightarrow i,t-1} = F_{\rightarrow i,t} + \eta_{\rightarrow i,t}$ where $\eta_{\rightarrow i,t}$ captures valuation effects—changes in the stock in U.S. dollar that pertains to exchange rate fluctuations, market price fluctuations, and measurement errors. I let $p_{\rightarrow i,t} \equiv \frac{P_{\rightarrow i,t}}{Y_{i,t}}$ denote the inward investment position of country $i$ in percent of GDP. With these notations, equation (1) is equivalent to the following:

$$\Delta U_{i,t} = \beta \left[ \frac{\Delta P_{\rightarrow i,t}}{P_{\rightarrow i,t-1}} - \frac{\eta_{\rightarrow i,t}}{P_{\rightarrow i,t-1}} \right] p_{\rightarrow i,t-1} + \gamma_i + \gamma_t + \varepsilon_{i,t} \tag{2}$$

A shift-share instrument variable for $\frac{P_{\rightarrow i,t}}{P_{\rightarrow i,t-1}} p_{\rightarrow i,t-1}$ can be defined as:

$$Z_{i,t} \equiv \sum_{j \neq i} \frac{P_{j \rightarrow i,t-1}}{P_{\rightarrow i,t-1}} g\left(P_{j \rightarrow W \setminus i,t}\right) p_{\rightarrow i,t-1} \tag{3}$$

where $P_{j \rightarrow W \setminus i,t} \equiv \sum_{\ell \notin \{i,j\}} P_{j \rightarrow \ell,t}$. Abstracting from $p_{\rightarrow i,t-1}$, which I assume independent of $\varepsilon_{i,t}$ conditional on the controls, this instrument is the inner product of the shares of each foreign country

$j$ in the investment position received by country $i$ and the growth rates of the investment position of $j$ in the rest of the world, excluding country $i$. It is important to note that the instrument $Z_{i,t}$ does not contain the investment position in the same period $P_{j\to i,t}$ for any $j$, thereby addressing the endogeneity concern that a pull factor might drive the explanatory variable.

The instrument is expected to be relevant because international investment allocations are persistent. It is well documented that gravity factors, such as distance, language, or culture, explain a substantial part of asset holdings (see, *e.g.*, Portes and Rey, 2005). Mercado (2018) reports that the same gravity factors also influence bilateral capital flows. Thus, when there is an outward investment boom in one country, relatively high shares of the increased investment are expected to be directed to the 'nearest' countries, which also represented relatively high shares in the initial allocation of investment. These drivers of flows are independent of conditions in recipient countries, which is what my IV aims at capturing.

I address remaining potential endogeneity concerns with fixed effects. The exclusion restriction requires that investment flows toward third-party countries $P_{j\to\ell,t}$ not be correlated with $\varepsilon_{i,t}$, conditional on controls. Endogeneity could arise from common factors underlying international capital flows, such as the global business or financial cycles. Aldasoro et al. (2023) find, for instance, that the shift-share instrument based on cross-border lending is correlated with the global financial cycle. However, country and year fixed effects should capture such global cycles, so it is reasonable to consider the exclusion restriction satisfied—especially as most of the countries in my sample are relatively closed economies, so that it is less likely that other confounding factors (such as global financial conditions or risk appetite) may influence their economies if not through capital flows.[2]

## 3.2. Dynamic panel regressions

In addition to the *immediate* impact of capital inflows, I also want to investigate how the impact evolves in the medium-term. The effects of capital flows are likely to take time to fully materialize, since they are often associated with multiyear investment plans. I analyze the dynamic effects by employing local projections with instrumental variables (Jordà, 2005). Specifically, I estimate the

[2] As a robustness check, I have also run my regressions on a sample restricted to countries with a flexible exchange rate regime, which are better insulated from global financial cycles (Obstfeld et al., 2019).

following equation, which is similar to equation (2), but for varying time horizons $h \in H \equiv \{0, \ldots, 4\}$:

$$U_{i,t+h} - U_{i,t-1} = \beta^{(h)} \frac{\Delta P_{\to i,t}}{P_{\to i,t-1}} p_{\to i,t-1} + lags + \gamma_i^{(h)} + \gamma_t^{(h)} + \varepsilon_{i,t}^{(h)} \tag{4}$$

The left-hand side is the accumulated change in the variable of interest $U$ between years $t-1$ and $t+h$. The main coefficients of interest are $\beta^{(h)}$, which can be interpreted as the impact on the outcome variable $h$ years after a capital inflow. The impact of capital flows can be persistent, so I include lags. As is common practice with local projections, I include lags of both $\Delta U$ and the main explanatory variable (Jordà, 2005; Jordà and Taylor, 2016; Jordà et al., 2020).[3] With these controls, I can assume that $\mathbb{E}[Z_{i,t} \cdot g(P_{\to i,t-n}) p_{\to i,t-n-1}] = 0$ and $\mathbb{E}[Z_{i,t} \cdot \Delta U_{i,t-n}] = 0$ for all included lags $n$.

## 3.3. Data

To cover all types of capital flows, I rely on various sources and adapt the methodology accordingly. The data for the various outcome variables $U$ come from IMF and World Bank databases. The inward investment positions ($p_{\to i,t}$) are from the IMF's International Investment Position (IIP) Statistics, which offer the best coverage. For inflows ($F_{\to i,t}$), I use either the IMF's balance of payments (BoP) data or the restated flows by Coppola et al. (2021).[4] For the bilateral investment positions ($P_{j \to i,t}$) that are necessary to construct the IVs, I draw from various datasets, which are described in the rest of this subsection. More details are provided in Appendix C.

### Reported cross-border investments

To construct the IV for **portfolio investments (equity and bonds)**, I use the IMF's Coordinated Portfolio Investment Survey (CPIS). The survey covers end-year investment positions from 2001 onward; 67 economies responded for end-2001, 86 for end-2020. I use the liability data that are derived

[3] The best tradeoff between parsimony and fit leads me to choose 2 lags; as a robustness check, I checked that results with only one lag of the first difference of the explanatory variable are similar. Besides, for the sake of parsimony, I do not instrument lagged capital flows, the lags essentially neutralizing the risk of endogeneity.

[4] Inflows are defined as net sales of domestic financial instruments to foreign residents; they are positive when there is an increase in liabilities in the country's financial account, and negative if liabilities decrease.

by the IMF based on reported assets, which indirectly extends the coverage to non-participating economies.[5]

For **direct investments**, I use the IMF's Coordinated Direct Investment Survey (CDIS), which surveys outward and inward direct investment positions for 61 countries in 2009 and up to 85 economies in 2020.[6] Similarly to portfolio investment, I use FDI liability as derived from outward direct investment positions, to maximize coverage and reliability.

**Other investments** (in the BoP terminology) mostly comprise cross-border loans. I propose two versions of the related IV. The first is based on the BIS's Locational Banking Statistics (LBS). The LBS provides bilateral outstanding claims and liabilities of internationally active banks that locate in reporting countries, on a quarterly basis since 1977. The number of reporting countries grew from 28 in 2000 to 48 in 2020 and is estimated to cover more than 90 percent of all cross-border banking activity during 2000–2020. The BIS also calculates break- and exchange-rate-adjusted changes in these bilateral positions, filtering out the impact of methodological changes and exchange rate movements, and thereby approximating $F^{(OI)}_{i\to j,t}$. Thanks to this, an IV in terms of flows, free of valuation effects, is available:

$$Z^{(OI)}_{i,t} \equiv \left( \sum_{j \neq i} \frac{P^{(OI)}_{j\to i,t-1}}{P^{(OI)}_{\to i,t-1}} \frac{F^{(OI)}_{j\to W\setminus i,t}}{P^{(OI)}_{j\to W\setminus i,t-1}} \right) p^{(OI)}_{\to i,t-1} \tag{5}$$

The second IV for other investment is built with the BIS's Consolidated Banking Statistics (CBS). In 2000, 23 countries reported; in 2020 they were 31. The CBS measures international banking activity from a nationality rather than residency standpoint. For example, a loan to a Chilean firm made by the Spanish subsidiary of a banking group headquartered in France is counted as a loan from France to Chile in CBS, but from Spain to Chile in LBS. This dataset thus possibly creates a stronger IV than the LBS if the push factors behind international loan transactions stem from bank headquarters rather than from branches or subsidiaries.

[5] The CPIS also provides reported liability values by economies. However, bilateral data on holdings of portfolio investment are more reliable because it is usually easier for national statistics to know the destination of outward securities than the origin of incoming ones.

[6] CDIS and BoP/IIP data differ. Both follow the Sixth Edition of the Balance of Payments and International Investment Position Manual. However, the CDIS follows a directional principle while IIP and BoP use an asset/liability basis, which matters for reverse investments. Under the directional principle, the investment by a company in its direct investor (reverse investment) is netted out against investment by the direct investor. Under BoP, the same transaction increases the asset of the country.

### Restated external portfolios

For portfolio investments, the "Restated Bilateral External Portfolios" (RBEP) dataset by Coppola et al. (2021) is an alternative to CPIS.[7] It provides bilateral portfolio investment positions of countries in the CPIS from 2007 to 2017. It corrects notable flaws in officially reported data. Foremost, tax havens have sizable investment positions in the CPIS, majority of which are effectively the investments of other countries. The "Fund Holdings" methodology by Coppola et al. (2021) reallocates bilateral investment positions of the nine largest investor countries in the CPIS and the U.S. Treasury's International Capital (TIC) data, thanks to Morningstar data on the positions of mutual funds and exchange traded funds (ETF) and a parent-affiliate mapping.[8]

This dataset also captures better the effective nature of flows—some type of assets and liabilities appear as FDI in the IIP, but behave rather like portfolio investments. For example, when an offshore subsidiary of a Japanese firm issues bonds that it on-lends to its parent company, the flow is recorded as an increase in Japan's FDI liabilities in the IIP, while it is *de facto* a portfolio investment liability. This liability is reclassified as such in the RBEP. Coppola et al. (2021) report that such reclassification increases the relative importance of portfolio liabilities for large emerging markets. Similarly, Bertaut et al. (2019) estimates that CPIS likely understates global exposures to emerging bond and equity markets by roughly a third because of corporate bonds. As direct and portfolio investments are unlikely to impact recipient economies in the same way, the reclassified data should improve the accuracy of my results.

Since the dataset provides restated positions but not restated flows, I have to abstract from potential valuation effects and approximate $F_{\to i,t} \approx P_{\to i,t} - P_{\to i,t-1}$. The empirical model (2) thus becomes:

$$\Delta U_{i,t} = \beta g(P_{\to i,t}) p_{\to i,t-1} + \gamma_i + \gamma_t + \varepsilon_{i,t} \tag{6}$$

Although this explanatory variable ($g(P_{\to i,t}) p_{\to i,t-1}$) contains the valuation effects as a measurement error, the IV estimators should not be affected. Nevertheless, this approximation might raise a concern that my shift-share instrument is correlated with the valuation effect and becomes relevant only through it. My IVs are not directly affected by recipient-country-specific valuation changes by

[7] The data can be obtained at www.globalcapitalallocation.com.

[8] The nine countries or areas are Australia, Canada, Denmark, the European Monetary Union, Norway, Sweden, Switzerland, the U.K., and the U.S.

construction, but they could be influenced by common factors that drive valuation changes across recipient countries for a given investor country. The year fixed effects alleviate this concern to some extent.

To address this concern further, I inject the valuation effect that appears in IIP and BoP data into the RBEP data when constructing the instrument. Namely, comparing the change in the IIP and the BoP investment flow yields the aggregate valuation effect for given recipient country, year, and instrument: $\eta_{\to i,t} = \Delta P_{\to i,t}\Big|_{\text{IIP}} - F_{\to i,t}\Big|_{\text{BoP}}$. I then distribute these valuation effects across investor countries by assuming the valuation change is proportional to the opening bilateral investment position and can be applied to RBEP data—in other words, I posit $\forall\ j, i, t, k,\ \eta_{j\to i,t} \approx \eta_{\to i,t} P_{j\to i,t}/P_{\to i,t-1}$, which let us approximate flows as $F^{(k)}_{j\to i,t} \approx \Delta P_{j\to i,t} - \eta_{\to i,t} P_{j\to i,t}/P_{\to i,t-1}$. Finally, the instrument are constructed in the same way as that of other investment with the LBS (eq. (5)).

$$Z_{i,t} \equiv \left( \sum_{j \neq i} \frac{P^{(k)}_{j\to i,t-1}}{P^{(k)}_{\to i,t-1}} \frac{\sum_{\ell \notin \{i,j\}} F^{(k)}_{j\to \ell,t}}{P^{(k)}_{j\to W\setminus i,t}} \right) p^{(k)}_{\to i,t-1}$$

## 3.4. Sample and summary statistics

To have consistent samples across regressions while maximizing the sample size, I work with two samples—one for regressions based on reported flows (which covers 2009–2020 and encompasses the CPIS, LBS, and CBS data), another for RBEP-based regressions (2007–2017). Summary statistics are provided in Appendix D; the bottom four rows of Table D.3 compare the two samples.

FDI and 'other investment' dominate capital flows into the EMDEs, with mean values of 3.5 percent of GDP for FDI inflows and 2.6 percent of GDP for other investments. By contrast, the mean of bond and equity portfolio investments are 0.9 and 0.09 percent of GDP, respectively. Standard deviations are also substantially larger for FDI and other investments than for portfolio investments. These median sizes are similar in the RBEP-based sample. This alleviates the concern that the incomplete coverage of portfolio investment positions in the RBEP makes approximated investment flows substantially smaller than actual flows. Standard deviations, on the other hand, differ: in RBEP, they are slightly smaller for bond inflows and substantially greater for equity, which possibly reflects the fact that the RBEP-based flows contain valuation changes and the latter are likely more prevalent in equity than bond positions.

# 4. Regression results

In this section, I analyze the causal impact of each type of capital flows on real GDP growth and various other macroeconomic variables. Results are split between those obtained with reported data (flows from BoP, and IVs based on CPIS, CDIS, LBS, and CBS) and those obtained with the RBEP restated flows and positions.[9]

## 4.1. Regressions with officially reported flows

Correlations between real GDP growth and capital inflows vary across investment instruments. This can be seen in the OLS regression results that are summarized in the first four columns of Tables B.1–B.5. Direct investment inflows are strongly and persistently correlated with growth, with significantly positive coefficients for all horizons, even after controlling for year and country fixed effects, lagged values of the dependent variable and lagged inflows (Table B.3). By contrast, the coefficients of bond portfolio inflows and other investment inflows are insignificant, positive in the short run ($h = 0, 1$) and negative thereafter (Tables B.4 and B.1). Equity portfolio investment has a significantly positive coefficient in $h = 0$ and remains positive (but not statistically significant) for the rest of the horizon (Table B.2).

I turn to IV regressions to investigate causal effects, focusing first on confirming the validity of my instruments. The LBS-based IV for other investment flows appears strong throughout the local projection horizon, as evidenced by the first stage robust F-statistics in Table B.4 that are all above the rule-of-thumb threshold 10 and also above the critical value for 20% worst case bias in Montiel Olea and Pflueger (2013), which is 15. The CBS-based IV is also strong for $h = 0, 1, 2$, but not in $h = 3$. This difference in the strengths between the LBS and the CBS is likely attributable, at least partly, to the fact that LBS data is free of methodological breaks and exchange rate fluctuations. Given this result, in the following part of this subsection, I focus on the LBS-based regression for other investment.

Meanwhile, the IVs for portfolio investments and FDI are weak, with F-statistics below 4 (Tables B.1–B.3). This could be because valuation effect weakens the instruments. Suppose there is a substantial

[9] Results are robust to variations in trimming choices, country selection (*e.g.*, dropping small countries), and the addition of other types of capital inflows as lagged control variables.

amount of valuation effect in investment positions in recipient $l$ of investor $j$ ($\eta_{l\to j}$); while this would not reflect any push factor fluctuation in investor $j$, it would change the value of the instrument $Z_{i,t}$, weakening the instrument. Another possible reason is that gravity factors, such as distance or language, may not be as strong drivers of portfolio investment flows as they may be for loans, which would mean the correlation is weak between the allocation across recipients of new investments from a given country and that of its existing investment stock, in turn weakening the IV. Lastly, the effect of offshore intermediaries could prevent the IV that uses investors' locational information from appropriately capturing the persistence of capital flows and gravity factors, as tax havens bundle flows from various source countries.

The TSLS estimates suggest that other investment inflows cause significantly positive effects on real GDP growth in the short run, which dissipate after two years. The last four columns of Table B.5 show results with the LBS-based instruments; one percentage point of GDP of exogenous other investment inflows generates 0.35 and 0.49 percentage point in cumulative real GDP growth on impact ($h = 0$) and after one year ($h = 1$), respectively. This is economically significant: a standard deviation of other investment inflow in the sample is 4.5 percent of GDP. The coefficient becomes insignificant in $h = 2$ and $h = 3$.[10]

The same pattern is found with other macroeconomic outcome variables $U_{i,t}$ (Figure A.2).[11] Looking at the components of GDP, both private consumption and investment are significantly and positively impacted in the first three years (although the coefficient for investment on year $h = 0$ is significant only at the 10 percent level), then the effect dissipates. Real imports increase and real exports decrease in the first year, possibly due to the jump in domestic demand. Other investment inflows also cause inflation throughout the horizon.

My results show that a credit expansion follows an exogenous "other investment" inflow. Credit -to-GDP is estimated to rise by around 1.0 percentage point of GDP for the first three years and grow further in the fourth year. The estimated size of impact in $h = 0$ matches the size of the exogenous inflow of capital inflow, suggesting that exogenous foreign loans do not crowd out domestic credit

[10] Compared to the OLS estimates, the IV coefficients are greater in the first three years. This is consistent with the presumption that capital inflows are driven by push and pull factors. Capital inflows are expected to lift GDP growth and GDP growth is expected to attract capital inflows, so that GDP growth can be expressed as an increasing function of capital inflow in two ways. The OLS yields a weighted average of the slopes of these functions. When capital inflows are more sensitive to growth than growth to capital inflows, OLS estimates are smaller than TSLS's (Sanders et al., 2020).

[11] Results are summarized on impulse-response charts; detailed regression outputs are available on demand.

when they flow in. In the following years, both GDP and credit-to-GDP increase, which implies that the increase of foreign loans causes additional credit supply. While credit supply expands, nonperforming loan to total loan ratio declines in $h = 0, 1$ (which may reflect an increase of total loans), but then picks up in $h \geq 2$. Although the latter positive effect lacks statistical significance, it could suggest that an exogenous addition of loans that is driven by push factors is not used effectively and eventually undermines credit quality—ultimately offsetting initial GDP gains. This would also explain why impacts on real GDP, real investment, and real consumption dissipate over time.

Overall, these results resemble previous findings that growth in low- and middle-income countries rise during capital bonanzas, then return to pre-bonanza levels (for instance, Reinhart and Reinhart, 2008, although they do not establish causality). Aldasoro et al. (2023) also identify a positive causal effect of bank lending flows, and both Blanchard et al. (2017) and Davis (2015) find a positive impact on macroeconomic variables of the portion of capital flows that includes "other investments" (although they use broader aggregates).

## 4.2. Regressions with restated flows

With the RBEP data, the IV for bond portfolio investment becomes substantially stronger; the robust F-statistics are all around or above 10 (Table B.6). The estimated causal effect on real GDP gradually increases and reaches 1.05 in $h = 2$, which is significantly different from 0, before dropping to 0.58 in $h = 3$. Looking at other macro variables (Figure A.3), I find that neither real investment nor real private consumption receive a significant effect from a bond portfolio inflow. Nevertheless, the estimates of real private consumption are positive throughout the local projection horizon.

The causal effect of equity portfolio investment cannot be identified even with the restated RBEP data. The IV proves too weak, possibly because valuation effects, which are known to be larger for equity than bonds, invalidate my approximations to rebuild capital flows. The comparison of the bond results with previous findings in the literature is interesting. Similar to Sanders et al. (2020), I find that bond investment has a positive and long-lasting effect on real GDP growth.

This finding, however, contrasts with Blanchard et al. (2017), who find that bond inflows have small, negative impacts on output, arguing that the contractionary impact of the exchange rate

appreciation triggered such flows is not compensated by easier financing conditions (unlike with non-bond instruments).[12] To investigate this further, I filter out countries where appreciation effect cannot play. Figure A.4 plots the local projections for countries where the exchange rate is allowed to respond.[13] It shows a lasting appreciation of the exchange rate as a consequence of exogenous bond inflows (0.8 log point in $h = 0$); despite this, expansionary effects are still significant, transiting through both real investment and real private consumption, which seem stimulated by lower lending interest rates.

Compared with the 19 emerging markets studied by Blanchard et al. (2017), my sample is larger and covers less developed countries, which may explain why I find contrasting results. Bond investments are not necessarily determined by the monetary policy rate; the RBEP typically includes longer-term bonds. As my sample include countries where monetary policy transmission may be weaker and financial markets more shallow, bond inflows may then trigger an expansionary improvement in financing conditions. Another explanation is that policy responses, in terms of monetary policy, foreign exchange interventions, and capital flow management measures, may contribute to mute the contractionary effect of inflows on the exchange rate.

### 4.3. Role of economic fundamentals

The literature finds that the impact of capital inflows on a recipient country may depend on its absorptive capacity (Borensztein et al., 1998)—such as the quality of the economic, political, and social environment (Li and Liu, 2005; Choe, 2003). This heterogeneity is often cited as an explanation for the lack of consensual empirical results.

In this section, I revisit this idea by allowing the impact of capital flows to differ between countries depending on the soundness of their macroeconomic framework. Namely, I run the following regressions:

$$U_{i,t+h} - U_{i,t-1} = \beta^{(h)} g(P_{\to i,t}) p_{\to i,t-1} + \beta_{+}^{(h)} w g(P_{\to i,t}) p_{\to i,t-1} + lags + \gamma_i^{(h)} + \gamma_t^{(h)} + \varepsilon_{i,t}^{(h)} \tag{7}$$

[12] In their model, the increased demand for domestic bonds generates a sharp appreciation of the exchange rate when the central bank keeps constant the rate of return on (short-term) bonds. In turn, the appreciation triggers depreciation expectations that push the return on domestic non-bonds upward, which is contractionary.

[13] I run these regressions only with countries under a floating exchange rate regime; to maintain nonetheless enough observations, I use a sample that consistently covers horizons $h = 0 \dots 2$.

where $w$ is either the initial level of public debt or the risk premium—the first relates to macroeconomic imbalances, the latter proxies for domestic financing conditions.[14] I run these regressions as such on the entire sample, as well as with binary variables instead of $w$ that equal one when $w$ is above the top 30th percentile (in which case I run the regressions on the sub-sample that keeps only the top and low 30 percentiles for $w$). For ease of interpretation, I only report the latter; Figure A.5 plots the evolution of $\beta_+$ when $h$ varies.

Even when differentiating across country fundamentals, instruments remain weak and I cannot identify an impact for FDI or portfolio equity inflows. However, countries with higher financing costs seem to benefit more than others from loan and bond inflows (Table B.8). External finance thus seems to more usefully complement domestic markets when the latter suffer from tight financing conditions; otherwise, they may simply finance the less productive projects. I also find loan inflows are less favorable for countries with high public debt (Table B.9). This was expected: such countries have less absorptive capacity, and potentially use external investors to compensate for less public investment, rather than complement it.

The bottom panel of Figure A.5 plots the coefficient of interaction between other investment inflows and financial development (using the summary measure proposed by Sahay et al., 2015). It shows how the expansionary impact is dampened when financial markets are more developed. Even though these results are somewhat tentative as F-statistics are smaller and estimates less significant than for my main findings, they show signs that not all capital inflows are more expansionary, the lesser the level of financial development. Portfolio investments would on the contrary yield more growth dividends in countries better equipped with financial markets and institutions.

## 5. Conclusion

This paper sheds light on the impact of capital flows on recipient countries, with a new approach based on a shift-share instrument. I find that other investment and bond portfolio investment have positive causal effects on macroeconomic variables such as real GDP and real investment. These findings are consistent with most of the literature, but diverge from those of Blanchard et al. (2017).

[14] The risk premium is the spread between the lending rate to the private sector and the government.

As it uses annual data and estimates the medium-term responses of economic activity capital inflows, the paper also relates to the policy discussion on whether such flows contribute to development and how this contribution depends on country characteristics. It provides implications for the EMDEs to reap the benefits and mitigate the risks of capital flows. Namely. the empirical findings suggest that not all flows impact EMDEs alike; while countries often try to attract FDI because it is a more stable (hence less risky) source of funding, they should also consider attracting debt instruments (bonds and loans), which seems to be associated with more significant growth dividends. Other flows may well be more pro-cyclical, in the sense that they may come into countries that already growing rather fueling growth. Last, the economically significant positive effects of an exogenous capital inflow also imply that global monetary tightening in advanced economies may negatively affect EMDEs, especially with respect to bonds and loan inflows.

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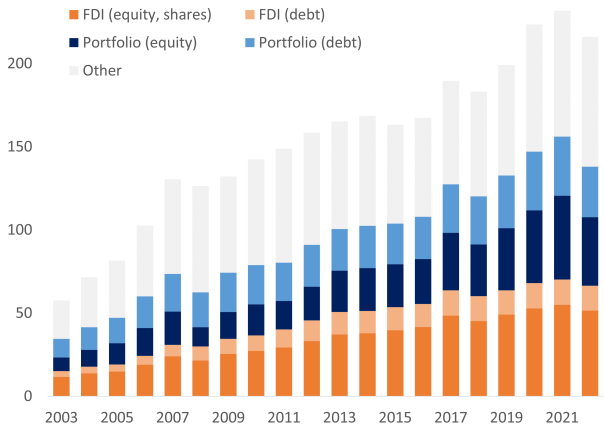
# Appendices

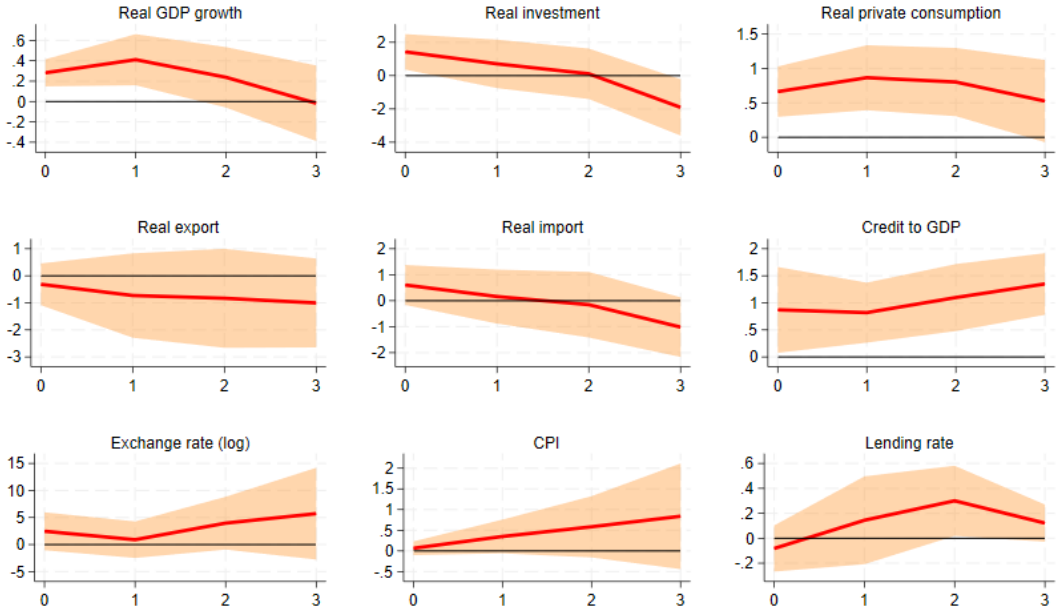
## A. Charts

***Figure A.1.*** *Gross capital flows in the world (in* USD *trillion)*



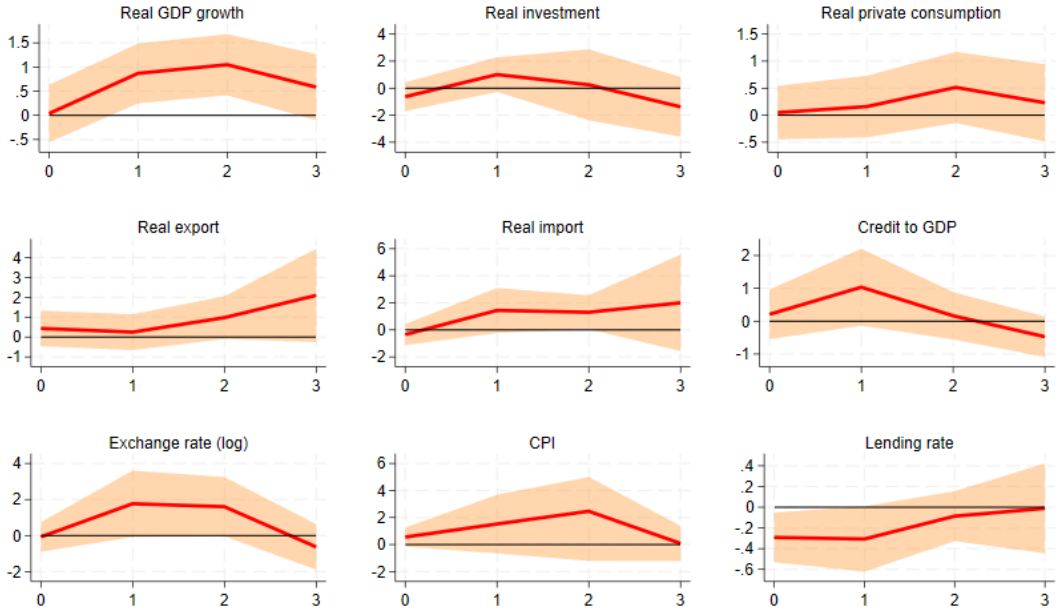

*Source:* IMF IIP data

***Figure A.2.*** *Responses to other investment inflow*



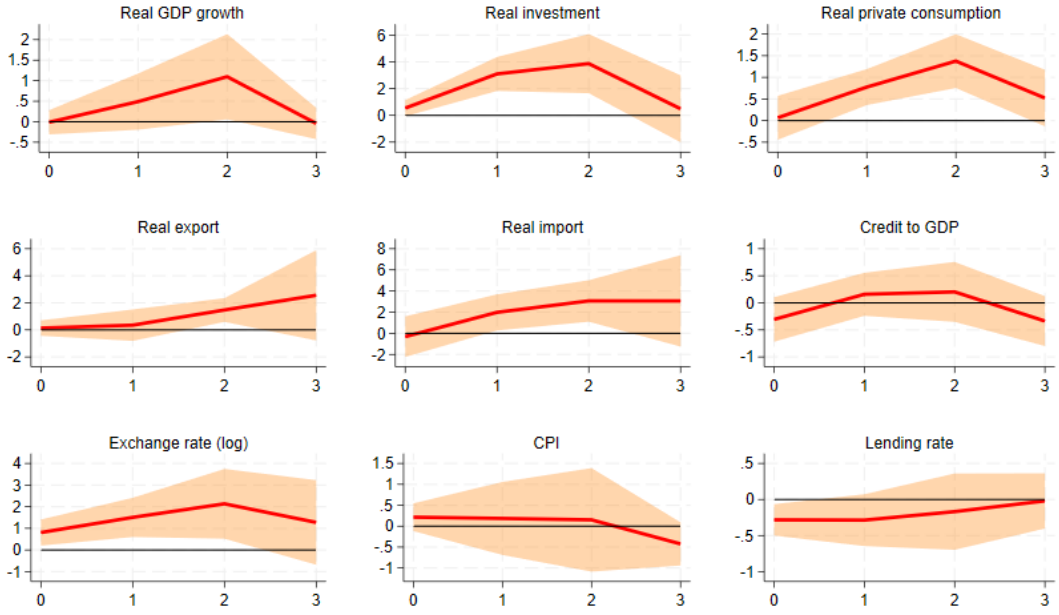

*Notes:* The charts plot the accumulated change of each variable observed after capital flows in (at year 0). Shaded areas represent the 90 percent confidence bands of the TSLS estimate. When estimates exceed the plot area, lines are not displayed. In all underlying regressions, country and year fixed-effects are controlled for, standard errors are clustered by countries.

***Figure A.3.*** *Responses to bond portfolio investment inflows*




*Notes:* The charts plot the accumulated change of each variable observed after capital flows in (at year 0). Shaded areas represent the 90 percent confidence bands of the TSLS estimate. When estimates exceed the plot area, lines are not displayed. In all underlying regressions, country and year fixed-effects are controlled for, standard errors are clustered by countries.

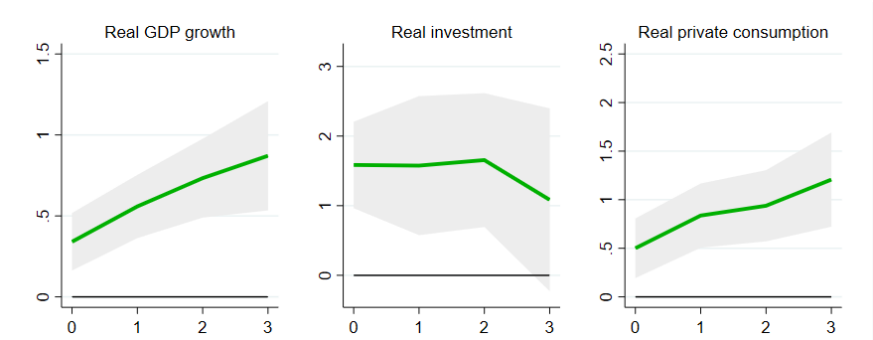
***Figure A.4.*** *Responses to bond portfolio investment inflows under floating regimes*



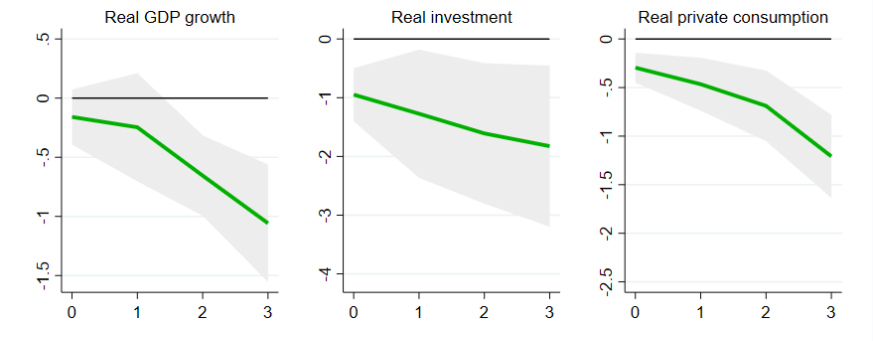

*Notes:* The charts plot the accumulated change of each variable observed after capital flows in (at year 0). Shaded areas represent the 90 percent confidence bands of the TSLS estimate. When estimates exceed the plot area, lines are not displayed. In all underlying regressions, country and year fixed-effects are controlled for, standard errors are clustered by countries.

***Figure A.5.*** *Heterogeneity of impact of other investment inflows (*LBS*-based* IV*)*

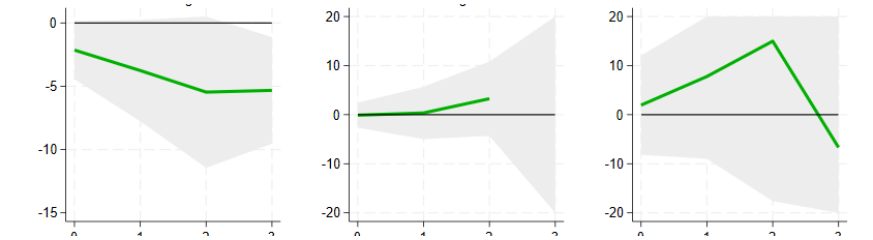
**(a)** Marginal effect on countries with high corporate spread




**(b)** Marginal effect on countries with high public debt




**(c)** Interaction with financial development



*Notes:* The charts plot the accumulated change of each variable observed after capital flows in (at year 0). Shaded areas represent the 90 percent confidence bands of the TSLS estimate. When estimates exceed the plot area, lines are not displayed. In all underlying regressions, country and year fixed-effects are controlled for, standard errors are clustered by countries

## B. Local projection tables

***Table B.1.*** *Effect of bond portfolio inflow on real* GDP *over time*

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| Debt inflow/GDP | 0.047 | 0.049 | -0.12 | -0.23 | -11.1 | -13.3 | -18.7 | -15.8 |
| | (0.062) | (0.14) | (0.17) | (0.25) | (29.9) | (30.9) | (56.2) | (29.4) |
| L.Debt inflow/GDP | -0.072 | -0.21** | -0.31** | -0.35** | 1.25 | 1.31 | 1.74 | 1.55 |
| | (0.050) | (0.10) | (0.14) | (0.17) | (3.13) | (3.12) | (5.60) | (3.20) |
| L2.Debt inflow/GDP | -0.17*** | -0.33*** | -0.47*** | -0.50** | 0.29 | 0.023 | -0.090 | -0.47 |
| | (0.058) | (0.12) | (0.17) | (0.20) | (1.36) | (1.05) | (1.45) | (1.04) |
| L.GDP growth | 0.25*** | 0.32*** | 0.31*** | 0.31* | 0.29 | 0.20 | 0.0099 | 0.032 |
| | (0.051) | (0.087) | (0.12) | (0.16) | (0.41) | (0.35) | (0.79) | (0.48) |
| L2.GDP growth | -0.016 | -0.018 | -0.11 | -0.26** | 0.27 | 0.27 | 0.38 | -0.014 |
| | (0.047) | (0.061) | (0.077) | (0.10) | (0.77) | (0.73) | (1.50) | (0.67) |
| Method | OLS | OLS | OLS | OLS | IV | IV | IV | IV |
| Horizon $h$ | 0 | 1 | 2 | 3 | 0 | 1 | 2 | 3 |
| N | 612 | 550 | 496 | 449 | 612 | 550 | 496 | 449 |
| 1st stage robust F stat | | | | | 0.1 | 0.2 | 0.1 | 0.3 |

*Notes:* Standard errors, clustered by countries, in parentheses; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. All regressions include country and year fixed-effects.

***Table B.2.*** *Effect of equity portfolio inflow on real* GDP *over time*

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| Equity inflow/GDP | 0.25* | 0.34 | 0.18 | 0.17 | 1.09 | 1.20 | 0.45 | 0.27 |
| | (0.14) | (0.28) | (0.47) | (0.55) | (0.97) | (1.41) | (1.41) | (1.90) |
| L.Equity inflow/GDP | 0.32* | 0.55 | 0.84 | 1.05 | 0.24 | 0.48 | 0.82 | 1.04 |
| | (0.19) | (0.40) | (0.58) | (0.70) | (0.23) | (0.43) | (0.61) | (0.73) |
| L2.Equity inflow/GDP | -0.27 | -0.31 | -0.41 | -0.44 | -0.24 | -0.25 | -0.40 | -0.44 |
| | (0.19) | (0.24) | (0.37) | (0.46) | (0.22) | (0.27) | (0.36) | (0.43) |
| L.GDP growth | 0.24*** | 0.29*** | 0.27** | 0.25 | 0.23*** | 0.28*** | 0.27** | 0.25 |
| | (0.047) | (0.089) | (0.12) | (0.17) | (0.047) | (0.092) | (0.13) | (0.18) |
| L2.GDP growth | -0.018 | -0.036 | -0.14* | -0.30*** | -0.028 | -0.048 | -0.15* | -0.30*** |
| | (0.046) | (0.065) | (0.079) | (0.091) | (0.049) | (0.067) | (0.083) | (0.092) |
| Method | OLS | OLS | OLS | OLS | IV | IV | IV | IV |
| Horizon $h$ | 0 | 1 | 2 | 3 | 0 | 1 | 2 | 3 |
| N | 612 | 550 | 496 | 449 | 612 | 550 | 496 | 449 |
| 1st stage robust F stat | | | | | 2.3 | 4.8 | 5.4 | 4.0 |

*Notes:* Standard errors, clustered by countries, in parentheses; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. All regressions include country and year fixed-effects.

***Table B.3.*** *Effect of* FDI *inflow on real* GDP *over time*

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| FDI inflow/GDP | 0.038 | 0.053 | 0.040 | 0.083 | 0.14 | -0.14 | -0.33 | 0.064 |
| | (0.038) | (0.077) | (0.12) | (0.13) | (0.24) | (0.51) | (1.79) | (0.34) |
| L.FDI inflow/GDP | -0.0041 | -0.0088 | -0.0036 | 0.053 | 0.0018 | 0.073 | 0.24 | 0.26** |
| | (0.0095) | (0.025) | (0.030) | (0.090) | (0.059) | (0.092) | (0.37) | (0.10) |
| L2.FDI inflow/GDP | 0.019 | 0.0051 | -0.051 | -0.29*** | 0.10 | -0.018 | -0.070 | -0.21** |
| | (0.022) | (0.028) | (0.052) | (0.057) | (0.14) | (0.16) | (0.43) | (0.079) |
| L.Real GDP growth | 0.24*** | 0.30*** | 0.30** | 0.26 | 0.15** | 0.19 | 0.041 | -0.14 |
| | (0.051) | (0.098) | (0.13) | (0.18) | (0.074) | (0.16) | (0.19) | (0.18) |
| L2.Real GDP growth | -0.037 | -0.052 | -0.15 | -0.26*** | -0.088 | -0.054 | -0.23 | -0.28* |
| | (0.052) | (0.072) | (0.091) | (0.094) | (0.087) | (0.12) | (0.17) | (0.16) |
| Method | OLS | OLS | OLS | OLS | IV | IV | IV | IV |
| Horizon $h$ | 0 | 1 | 2 | 3 | 0 | 1 | 2 | 3 |
| N | 612 | 550 | 496 | 449 | 485 | 423 | 368 | 321 |
| 1st stage robust F stat | | | | | 1.2 | 1.2 | 0.3 | 0.7 |

*Notes:* Standard errors, clustered by countries, in parentheses; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. All regressions include country and year fixed-effects.

***Table B.4.*** *Effect of other investment inflow on real GDP over time (*LBS*-based* IV*)*

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| OI inflow/GDP | 0.030 | 0.048 | -0.011 | 0.00023 | 0.28*** | 0.41*** | 0.24 | -0.017 |
| | (0.036) | (0.057) | (0.059) | (0.070) | (0.081) | (0.15) | (0.18) | (0.23) |
| L.OI inflow/GDP | -0.013 | -0.057 | -0.067 | -0.11* | -0.11*** | -0.19*** | -0.16** | -0.11 |
| | (0.018) | (0.039) | (0.041) | (0.065) | (0.039) | (0.072) | (0.063) | (0.089) |
| L2.OI inflow/GDP | -0.057** | -0.13*** | -0.27*** | -0.34*** | -0.059* | -0.13** | -0.27*** | -0.34*** |
| | (0.026) | (0.047) | (0.073) | (0.12) | (0.030) | (0.054) | (0.078) | (0.11) |
| L.GDP growth | 0.24*** | 0.30*** | 0.28** | 0.27 | 0.23*** | 0.29*** | 0.27** | 0.27 |
| | (0.050) | (0.092) | (0.12) | (0.17) | (0.055) | (0.10) | (0.13) | (0.17) |
| L2.GDP growth | -0.018 | -0.020 | -0.077 | -0.18 | -0.049 | -0.067 | -0.11 | -0.18 |
| | (0.049) | (0.069) | (0.093) | (0.12) | (0.062) | (0.088) | (0.11) | (0.13) |
| Method | OLS | OLS | OLS | OLS | IV | IV | IV | IV |
| Horizon $h$ | 0 | 1 | 2 | 3 | 0 | 1 | 2 | 3 |
| N | 612 | 550 | 496 | 449 | 612 | 550 | 496 | 449 |
| 1st stage robust F stat | | | | | 53.9 | 52.4 | 40.5 | 44.0 |

*Notes:* Standard errors, clustered by countries, in parentheses; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. All regressions include country and year fixed-effects.

***Table B.5.*** *Effect of other investment inflow on real GDP over time (*CBS*-based* IV*)*

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| OI inflow/GDP | 0.030 | 0.048 | -0.011 | 0.00023 | 1.64*** | 2.27*** | -1.58*** | 0.33 |
| | (0.036) | (0.057) | (0.059) | (0.070) | (0.36) | (0.64) | (0.55) | (2.54) |
| L.OI inflow/GDP | -0.013 | -0.057 | -0.067 | -0.11* | -0.62*** | -0.90*** | 0.55* | -0.21 |
| | (0.018) | (0.039) | (0.041) | (0.065) | (0.20) | (0.33) | (0.30) | (0.76) |
| L2.OI inflow/GDP | -0.057** | -0.13*** | -0.27*** | -0.34*** | -0.070 | -0.13 | -0.28*** | -0.37 |
| | (0.026) | (0.047) | (0.073) | (0.12) | (0.079) | (0.12) | (0.079) | (0.25) |
| L.GDP growth | 0.24*** | 0.30*** | 0.28** | 0.27 | 0.17* | 0.23 | 0.32** | 0.25 |
| | (0.050) | (0.092) | (0.12) | (0.17) | (0.098) | (0.16) | (0.13) | (0.20) |
| L2.GDP growth | -0.018 | -0.020 | -0.077 | -0.18 | -0.21 | -0.31 | 0.12 | -0.22 |
| | (0.049) | (0.069) | (0.093) | (0.12) | (0.18) | (0.25) | (0.17) | (0.28) |
| Method | OLS | OLS | OLS | OLS | IV | IV | IV | IV |
| Horizon $h$ | 0 | 1 | 2 | 3 | 0 | 1 | 2 | 3 |
| N | 612 | 550 | 496 | 449 | 612 | 550 | 496 | 449 |
| 1st stage robust F stat | | | | | 26.1 | 17.4 | 17.0 | 0.4 |

*Notes:* Standard errors, clustered by countries, in parentheses; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. All regressions include country and year fixed-effects.

***Table B.6.*** *Effect of portfolio bond investment inflow on real GDP over time (*RBEP*-based* IV*)*

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| Bond inflow/GDP | 0.091 | 0.22 | 0.28** | 0.35* | 0.038 | 0.87** | 1.05*** | 0.58 |
| | (0.14) | (0.17) | (0.13) | (0.19) | (0.36) | (0.38) | (0.39) | (0.42) |
| L.Bond inflow/GDP | 0.19 | 0.27 | 0.30** | 0.21 | 0.19 | 0.36 | 0.49*** | 0.30 |
| | (0.16) | (0.20) | (0.12) | (0.32) | (0.16) | (0.25) | (0.17) | (0.21) |
| L2.Bond inflow/GDP | 0.15 | 0.25** | 0.22 | 0.078 | 0.14 | 0.40** | 0.49** | 0.19 |
| | (0.11) | (0.12) | (0.20) | (0.49) | (0.12) | (0.16) | (0.20) | (0.36) |
| L.GDP growth | -0.83 | -0.63* | -0.24*** | -0.47*** | -0.82 | -0.65* | -0.27*** | -0.48*** |
| | (0.53) | (0.34) | (0.074) | (0.095) | (0.52) | (0.34) | (0.088) | (0.097) |
| L2.GDP growth | 0.045 | -0.55** | -0.56*** | -0.67*** | 0.045 | -0.55** | -0.57*** | -0.68*** |
| | (0.10) | (0.22) | (0.18) | (0.20) | (0.10) | (0.21) | (0.19) | (0.20) |
| Method | OLS | OLS | OLS | OLS | IV | IV | IV | IV |
| Horizon $h$ | 0 | 1 | 2 | 3 | 0 | 1 | 2 | 3 |
| N | 550 | 471 | 380 | 308 | 550 | 471 | 380 | 308 |
| 1st stage robust F stat | | | | | 15.5 | 47.4 | 55.0 | 9.8 |

*Notes:* Standard errors, clustered by countries, in parentheses; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. All regressions include country and region-year fixed effects.

***Table B.7.*** *Effect of portfolio equity investment inflow on real GDP over time (*RBEP*-based* IV*)*

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| Equity inflow/GDP | -0.11** | -0.0100 | 0.11*** | 0.18*** | -0.62 | -0.35 | 0.51 | 0.63 |
| | (0.051) | (0.043) | (0.018) | (0.021) | (0.68) | (0.50) | (0.73) | (0.76) |
| L.Equity inflow/GDP | 0.047** | 0.068 | 0.21*** | 0.25*** | -0.12 | -0.044 | 0.35 | 0.41 |
| | (0.019) | (0.050) | (0.028) | (0.033) | (0.22) | (0.17) | (0.24) | (0.27) |
| L2.Equity inflow/GDP | 0.086** | 0.11*** | 0.17*** | 0.15*** | -0.017 | 0.036 | 0.25* | 0.26 |
| | (0.043) | (0.023) | (0.031) | (0.026) | (0.10) | (0.100) | (0.15) | (0.18) |
| L.GDP growth | -0.83 | -0.61* | -0.19*** | -0.41*** | -0.87 | -0.64* | -0.14 | -0.34* |
| | (0.53) | (0.34) | (0.072) | (0.10) | (0.56) | (0.34) | (0.11) | (0.18) |
| L2.GDP growth | 0.059 | -0.53** | -0.48** | -0.60*** | 0.033 | -0.55** | -0.44** | -0.54** |
| | (0.11) | (0.23) | (0.19) | (0.21) | (0.089) | (0.23) | (0.22) | (0.25) |
| Method | OLS | OLS | OLS | OLS | IV | IV | IV | IV |
| Horizon $h$ | 0 | 1 | 2 | 3 | 0 | 1 | 2 | 3 |
| N | 550 | 471 | 380 | 308 | 550 | 471 | 380 | 308 |
| 1st stage robust F stat | | | | | 6.7 | 1.5 | 1.2 | 1.1 |

*Notes:* Standard errors, clustered by countries, in parentheses; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. All regressions include country and region-year fixed effects.

***Table B.8.*** *Other investment inflow effect vs. domestic spread*

| | Real GDP growth | | | | | Real investment growth | | | | | Real consumption growth | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) |
| OI Inflow/GDP | 0.036 | -0.0023 | -0.28 | -0.69*** | -1.08*** | 0.26 | -0.93 | -1.35 | -3.36*** | -5.20*** | 0.35* | 0.40 | 0.21 | -0.37 | -1.31*** |
| | (0.080) | (0.12) | (0.17) | (0.21) | (0.25) | (0.62) | (0.80) | (0.89) | (1.17) | (1.59) | (0.19) | (0.26) | (0.32) | (0.36) | (0.41) |
| OI Inflow/GDP × large spread | 0.34*** | 0.56*** | 0.73*** | 0.87*** | 0.97*** | 1.59*** | 1.58** | 1.66*** | 1.08 | 1.43 | 0.50** | 0.84*** | 0.94*** | 1.21*** | 1.55*** |
| | (0.11) | (0.12) | (0.15) | (0.20) | (0.27) | (0.38) | (0.61) | (0.58) | (0.80) | (1.06) | (0.19) | (0.20) | (0.22) | (0.29) | (0.42) |
| L.OI Inflow/GDP | -0.14** | -0.27** | -0.21* | -0.075 | 0.083 | -0.69 | -0.65 | -0.13 | 0.93 | 1.24 | -0.34 | -0.63** | -0.55** | -0.28 | 0.11 |
| | (0.055) | (0.10) | (0.11) | (0.13) | (0.13) | (0.45) | (0.69) | (0.59) | (0.70) | (1.11) | (0.21) | (0.26) | (0.22) | (0.24) | (0.36) |
| L2.OI Inflow/GDP | -0.065* | -0.087 | -0.21** | -0.30** | -0.35** | -0.46** | -0.34 | -1.03*** | -1.73*** | -1.83*** | -0.15 | -0.14 | -0.25 | -0.42 | -0.50 |
| | (0.035) | (0.079) | (0.10) | (0.13) | (0.15) | (0.18) | (0.28) | (0.32) | (0.39) | (0.46) | (0.10) | (0.12) | (0.17) | (0.27) | (0.35) |
| L.GDP growth | 0.20*** | 0.22** | 0.22 | 0.17 | 0.018 | | | | | | | | | | |
| | (0.054) | (0.11) | (0.14) | (0.20) | (0.24) | | | | | | | | | | |
| L2.GDP growth | -0.039 | -0.050 | -0.19 | -0.28** | -0.40** | | | | | | | | | | |
| | (0.070) | (0.093) | (0.12) | (0.14) | (0.16) | | | | | | | | | | |
| L.Investment growth | | | | | | 0.035 | 0.11 | 0.070 | 0.040 | -0.045 | | | | | |
| | | | | | | (0.060) | (0.086) | (0.13) | (0.18) | (0.21) | | | | | |
| L2.Investment growth | | | | | | -0.090 | 0.024 | -0.011 | 0.17 | 0.024 | | | | | |
| | | | | | | (0.078) | (0.089) | (0.11) | (0.18) | (0.19) | | | | | |
| L.Consumption growth | | | | | | | | | | | -0.081 | 0.026 | 0.19 | -0.0056 | 0.083 |
| | | | | | | | | | | | (0.11) | (0.18) | (0.26) | (0.24) | (0.20) |
| L2.Consumption growth | | | | | | | | | | | -0.15* | -0.16 | -0.45** | -0.47* | -0.45 |
| | | | | | | | | | | | (0.084) | (0.18) | (0.20) | (0.24) | (0.32) |
| Dept var. | rGDP | rGDP | rGDP | rGDP | rGDP | rInv_ifs | rInv_ifs | rInv_ifs | rInv_ifs | rInv_ifs | rCpriv | rCpriv | rCpriv | rCpriv | rCpriv |
| Horizon $h$ | 0 | 1 | 2 | 3 | 4 | 0 | 1 | 2 | 3 | 4 | 0 | 1 | 2 | 3 | 4 |
| N | 505 | 451 | 406 | 368 | 332 | 337 | 297 | 265 | 238 | 214 | 382 | 339 | 303 | 273 | 246 |
| 1st stage rob. F stat | 22.9 | 20.1 | 16.2 | 21.3 | 19.4 | 10.1 | 7.6 | 10.9 | 11.8 | 8.7 | 16.9 | 15.2 | 16.1 | 22.6 | 17.4 |

*Notes:* Standard errors, clustered by countries, in parentheses; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. These regressions rely on the LBS-based IVs. The spread variable is the difference between private and sovereign interest rates.

***Table B.9.*** *Other investment inflow effect vs. public debt*

| Dept var. | Real GDP growth | | | | | Real investment growth | | | | | Real consumption growth | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) |
| OI inflow/GDP | 0.24*** | 0.32 | 0.15 | 0.18 | -0.25 | 1.27* | 0.36 | -0.34 | -1.00 | -1.29 | 0.39* | 0.60* | 0.39 | 0.36 | 0.19 |
| | (0.084) | (0.19) | (0.19) | (0.27) | (0.24) | (0.65) | (1.24) | (1.06) | (1.22) | (1.65) | (0.22) | (0.32) | (0.38) | (0.42) | (0.53) |
| OI inflow/GDP × large public debt | -0.16 | -0.25 | -0.66*** | -1.06*** | -1.10*** | -0.95*** | -1.27* | -1.61** | -1.82** | -2.97*** | -0.30*** | -0.47*** | -0.69*** | -1.21*** | -1.77*** |
| | (0.14) | (0.28) | (0.21) | (0.30) | (0.26) | (0.27) | (0.66) | (0.73) | (0.83) | (0.71) | (0.093) | (0.17) | (0.22) | (0.26) | (0.33) |
| L.OI inflow/GDP | -0.046 | -0.096 | -0.024 | -0.13 | 0.29** | -0.15 | -0.17 | 0.66 | 0.72 | 0.50 | -0.16 | -0.29 | -0.22 | -0.10 | 0.0033 |
| | (0.046) | (0.10) | (0.11) | (0.21) | (0.14) | (0.34) | (0.64) | (0.69) | (0.84) | (1.11) | (0.19) | (0.27) | (0.27) | (0.27) | (0.33) |
| L2.OI inflow/GDP | -0.077* | -0.19** | -0.37*** | -0.36** | -0.50*** | -0.50** | -0.41 | -1.20*** | -1.42** | -1.16 | -0.11* | -0.23* | -0.37* | -0.51* | -0.50 |
| | (0.041) | (0.072) | (0.085) | (0.16) | (0.16) | (0.19) | (0.38) | (0.40) | (0.58) | (0.71) | (0.066) | (0.13) | (0.20) | (0.28) | (0.32) |
| L.GDP growth | 0.27*** | 0.23** | 0.17 | 0.072 | -0.050 | | | | | | | | | | |
| | (0.066) | (0.11) | (0.12) | (0.16) | (0.20) | | | | | | | | | | |
| L2.GDP growth | -0.089 | -0.086 | -0.076 | -0.24 | -0.50* | | | | | | | | | | |
| | (0.090) | (0.12) | (0.15) | (0.23) | (0.25) | | | | | | | | | | |
| L.Investment growth | | | | | | -0.055 | -0.20 | -0.33* | -0.44** | -0.61*** | | | | | |
| | | | | | | (0.059) | (0.17) | (0.18) | (0.18) | (0.20) | | | | | |
| L2.Investment growth | | | | | | -0.048 | 0.026 | -0.096 | -0.094 | -0.20 | | | | | |
| | | | | | | (0.087) | (0.15) | (0.17) | (0.21) | (0.21) | | | | | |
| L.Consumption growth | | | | | | | | | | | 0.00009 | 0.41* | 0.32 | 0.078 | -0.054 |
| | | | | | | | | | | | (0.16) | (0.23) | (0.29) | (0.26) | (0.26) |
| L2.Consumption growth | | | | | | | | | | | 0.097 | -0.16 | -0.17 | -0.36 | -0.72 |
| | | | | | | | | | | | (0.13) | (0.20) | (0.32) | (0.33) | (0.43) |
| Horizon $h$ | 0 | 1 | 2 | 3 | 4 | 0 | 1 | 2 | 3 | 4 | 0 | 1 | 2 | 3 | 4 |
| N | 333 | 302 | 276 | 251 | 222 | 225 | 203 | 186 | 170 | 151 | 240 | 215 | 196 | 178 | 157 |
| 1st stage rob. F stat | 5.2 | 5.9 | 6.4 | 31.4 | 6.0 | 4.6 | 4.0 | 3.4 | 3.0 | 2.5 | 5.2 | 5.3 | 4.1 | 5.5 | 4.1 |

*Notes:* Standard errors, clustered by countries, in parentheses; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. These regressions rely on the LBS-based IVs.

# C. Notes on data

## Dependent and macroeconomic variables

Real GDP and CPI are from the World Economic Outlook database. The lending risk premium, real investment, real consumption, real export, real import, the nominal effective exchange rate, and the NPL ratio are from the IMF's international finance statistics (IFS). The financial development index comes from Sahay et al. (2015), and other financial variables are taken from the World Bank's world development indicators.

## Investment flows and positions

From the CBS data, I use the international claims of domestic banks', which comprise cross-border claims in any currency plus local claims of foreign affiliates denominated in non-local currencies. The data of only bilateral cross-border claims are not publicly available.

In RBEP, I use different restated positions for $g(P_{\rightarrow i,t})$ and the IV. Since the "Fund Holdings" methodology by Coppola et al. (2021) covers only nine investor countries, it is not suitable to construct the total investment inflows $P_{\rightarrow i,t}$. Instead, I use values restated with the "Issuance" methodology, which uses a parent-affiliate mapping and Dealogic, Factset, and Refinitiv's Worldscope data on global outstanding securities. While this methodology reallocates investment positions in a given recipient country in the same way regardless of the investor country, this provides restated investment positions for all the CPIS countries. Meanwhile, I use the "Fund Holdings" restated values to derive $g(P_{j\rightarrow W\setminus i}t)$ for an IV as this should capture large investor countries' investment more accurately and contribute to the strength of the IV.

I exclude observations that could be materially affected by issues surrounding Australian and Norwegian data that Coppola et al. (2021) identified. Namely, the investment stocks of Australia and Norway are only available from 2017 and 2014, respectively. This brings about two issues. First, the missing data cause a measurement error in $P_{\rightarrow i,t}$, which I address by dropping recipients for which either country represents more than 20 percent of total investment positions at any time. Second, the discontinuity in the time series from the two countries cause a blip in total investment stocks, which does not represent any actual change. As I expect this may cause a severe bias, I

use a stricter threshold: I drop observations in 2014 and in 2017 of countries where the investment stock share of Norway and Australia, respectively, is greater than 10 percent at any point in time. Additionally, I drop data points with negative bilateral investment positions.

## Sample selection

After constructing the various IVs using all countries available as investor countries, I drop recipient countries that are included in the tax haven list of Coppola et al. (2021) (which is identical to Hines (2010) for emerging markets). I ensure that samples are consistent across regressions, while aiming at maintaining as many observations as possible. That is why I construct two samples—one for regressions based on reported flows (which covers 2009–2020 and encompasses the CPIS, LBS, and CBS data), another for RBEP-based regressions (2007–2017). Resulting country samples are in Table C.1.

***Table C.1.*** *Country coverage of the two samples*

| BOP sample (66 countries) | RBEP sample (82 countries) |
|---|---|
| Albania, Argentina, Armenia, Bangladesh, Belarus, Benin, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, Bulgaria, Burkina Faso, Cameroon, Chile, Colombia, Croatia, Côte d'Ivoire, Ecuador, Egypt, Georgia, Guinea, Hungary, India, Indonesia, Iraq, Jamaica, Kazakhstan, Kenya, Kuwait, Kyrgyz Republic, Malawi, Malaysia, Mali, Mexico, Moldova, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nicaragua, Niger, Nigeria, North Macedonia, Pakistan, Peru, Philippines, Poland, Russia, Rwanda, Senegal, Serbia, South Africa, Sri Lanka, Tajikistan, Tanzania, Thailand, Trinidad and Tobago, Tunisia, Türkiye, Uganda, Ukraine, Uruguay, Uzbekistan, Venezuela, and Zambia | Albania, Algeria, Angola, Argentina, Armenia, Belarus, Benin, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, Brunei Darussalam, Bulgaria, Burundi, Cambodia, Chile, China, Colombia, Dominican Republic, Ecuador, El Salvador, Eswatini, Ethiopia, Georgia, Guatemala, Guyana, Hungary, India, Indonesia, Iraq, Islamic Republic of Iran, Jamaica, Kazakhstan, Kuwait, Kyrgyz Republic, Lao P.D.R., Libya, Malawi, Malaysia, Mali, Mauritania, Mexico, Moldova, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nepal, Nicaragua, Nigeria, North Macedonia, Oman, Pakistan, Papua New Guinea, Paraguay, Peru, Poland, Qatar, Republic of Congo, Russia, Saudi Arabia, Senegal, Serbia, South Africa, Sri Lanka, Sudan, Tajikistan, Thailand, The Gambia, Togo, Trinidad and Tobago, Tunisia, Türkiye, Uganda, Ukraine, United Arab Emirates, Uruguay, Uzbekistan, Venezuela, Vietnam, Yemen, Zambia, and Zimbabwe |

## D. Summary statistics

***Table D.1.*** *Summary statistics for* BoP*-based sample (in percent of* GDP*)*

| | N | Mean | SD | p5 | p25 | p50 | p75 | p95 |
|---|---|---|---|---|---|---|---|---|
| Bond inflow (BoP) | 616 | 0.90 | 1.87 | -1.25 | -0.06 | 0.38 | 1.82 | 4.36 |
| Equity inflow (BoP) | 616 | 0.15 | 0.73 | -0.56 | -0.04 | 0.02 | 0.24 | 1.25 |
| FDI inflow (BoP) | 489 | 3.56 | 7.78 | 0.08 | 1.27 | 2.40 | 3.96 | 9.84 |
| Other investment inflow (BoP) | 616 | 2.59 | 4.78 | -1.87 | 0.24 | 1.71 | 3.59 | 10.01 |

***Table D.2.*** *Summary statistics for macroeconomic variables in* BoP*-based sample*

| | N | Mean | SD | p5 | p25 | p50 | p75 | p95 |
|---|---|---|---|---|---|---|---|---|
| Real GDP growth (percent) | 616 | 3.26 | 3.96 | -4.96 | 1.73 | 3.87 | 5.64 | 8.52 |
| Real investment growth (percent) | 406 | 4.05 | 12.54 | -15.64 | -2.23 | 4.53 | 10.67 | 24.18 |
| Real consumption growth (percent) | 446 | 3.09 | 7.16 | -4.97 | 1.21 | 3.66 | 5.69 | 10.07 |
| Real export growth (percent) | 470 | 3.36 | 11.79 | -14.95 | -0.64 | 3.93 | 8.19 | 16.62 |
| Real import growth (percent) | 470 | 4.40 | 12.46 | -14.38 | -0.69 | 4.85 | 10.06 | 21.77 |
| Change in credit/GDP (percentage point) | 501 | 0.99 | 4.71 | -5.61 | -0.80 | 0.77 | 2.68 | 7.74 |
| Exchange rate change (log point) | 248 | -2.47 | 8.72 | -19.52 | -4.82 | -0.83 | 2.23 | 7.05 |
| CPI change (log point) | 613 | 5.57 | 6.21 | -0.02 | 2.32 | 4.21 | 7.25 | 13.49 |
| NPL share change (percentage point) | 377 | 0.03 | 2.38 | -2.72 | -0.80 | -0.00 | 0.68 | 3.06 |
| Risk premium change (percentage point) | 233 | -0.10 | 2.43 | -3.44 | -0.73 | -0.10 | 0.61 | 3.16 |

***Table D.3.*** *Summary statistics for* RBEP*-based sample and joint sample (in percent of* GDP*)*

| | N | Mean | SD | p5 | p25 | p50 | p75 | p95 |
|---|---|---|---|---|---|---|---|---|
| Bond inflow (RBEP) | 550 | 0.59 | 2.06 | -1.64 | -0.10 | 0.20 | 1.22 | 3.70 |
| Equity inflow (RBEP) | 550 | 0.22 | 3.80 | -1.48 | -0.12 | 0.01 | 0.32 | 1.97 |
| Bond (RBEP; joint sample) | 438 | 0.68 | 2.15 | -1.68 | -0.12 | 0.36 | 1.35 | 3.73 |
| Equity (RBEP; joint sample) | 438 | 0.28 | 4.17 | -1.49 | -0.13 | 0.00 | 0.33 | 2.26 |
| Bond (BoP; joint sample) | 438 | 1.24 | 2.39 | -1.02 | 0.00 | 0.36 | 2.11 | 5.35 |
| Equity (BoP; joint sample) | 438 | 0.18 | 0.87 | -0.26 | -0.01 | 0.01 | 0.19 | 1.20 |

*Note:* The last four rows of this table show the RBEP- and BoP-based summary statistics, on the sample restricted to observations available for both.

***Table D.4.*** *Summary statistics for macroeconomic variables in* RBEP*-based sample*

| | N | Mean | SD | p5 | p25 | p50 | p75 | p95 |
|---|---|---|---|---|---|---|---|---|
| Real GDP growth (percent) | 550 | 3.88 | 7.50 | -1.92 | 1.78 | 3.80 | 5.81 | 8.98 |
| Real investment growth (percent) | 321 | 4.85 | 11.25 | -11.49 | -1.70 | 4.95 | 10.18 | 24.85 |
| Real consumption growth (percent) | 336 | 3.45 | 4.37 | -3.19 | 1.76 | 3.66 | 5.49 | 10.44 |
| Real export growth (percent) | 354 | 4.74 | 7.97 | -6.34 | 0.46 | 4.19 | 8.41 | 18.03 |
| Real import growth (percent) | 354 | 4.90 | 9.92 | -10.23 | -0.12 | 4.70 | 9.95 | 20.29 |
| Change in credit/GDP (percentage point) | 518 | 0.76 | 8.35 | -6.11 | -1.01 | 0.85 | 2.84 | 8.91 |
| Exchange rate change (log point) | 270 | -2.33 | 9.03 | -19.52 | -4.72 | -0.95 | 2.33 | 9.10 |
| CPI change (log point) | 548 | 6.12 | 11.00 | -0.26 | 2.01 | 4.00 | 7.12 | 16.64 |
| NPL share change (percentage point) | 387 | 0.19 | 2.30 | -2.74 | -0.61 | -0.01 | 0.61 | 3.64 |
| Risk premium change (percentage point) | 220 | -0.08 | 2.56 | -3.34 | -0.74 | -0.12 | 0.34 | 3.65 |

PUBLICATIONS

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Working Paper No. WP/2024/015