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Expectations-Based Capital Inflow Shocks

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Abstract

Identifying the impact of capital inflows on output is challenging because inflows are forward-looking and respond to expectations about future economic conditions. We develop a new measure of capital inflow shocks using a simple and broadly applicable expectations-based framework that isolates the unexpected component of inflows by purging movements predicted by professional forecasters' expectations. Estimates using the new measure for 27 emerging market economies indicate that capital inflows have sizable expansionary effects on output, operating through stronger domestic consumption and investment and easier financing conditions. Additional analysis indicates that equity-type inflows generate greater and more persistent effects than debt-type inflows, while large inflow reversals result in more pronounced effects than comparable increases in inflows. These results are robust to a wide range of alternative specifications.

Keywords

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Expectations-based Capital Inflow Shocks

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"The interplay between expectations and decisions is at the heart of every macroeconomic model in which most decisions are forward looking and depend on beliefs about the future. Indeed, how much to save, how to set prices, what technology to use, how to allocate investment across assets and many other decisions depend on what households, firms, traders, etc. predict about economic conditions..." Olivier Coibion and Yuriy Gorodnichenko, 2026, p.58

1. Introduction

Expectations are everywhere in economics. Inflation expectations influence borrowing costs and price-setting, income expectations shape household consumption and saving, and expectations about future demand and profitability affect firms' investment and hiring decisions. In international macroeconomics, exchange rate expectations are key to interpreting the Uncovered Interest Parity (UIP) premium (Kalemli-Özcan and Varela 2026).

Expectations also matter for capital flows. Capital inflows are widely viewed as an important driver of macroeconomic outcomes, yet establishing their causal impact remains challenging.[1] A central reason is that capital inflows are inherently forward-looking: countries with stronger growth expectations systematically attract more capital inflows.[2] The correlation between inflows and expectations can introduce a significant bias in empirical analyses that employ aggregate inflows as explanatory variables.

Progress on the challenging identification issue has often depended on specialized data sets that are either narrowly focused (on, for example, a particular type of capital inflow) or not widely available to researchers and policymakers. For example, researchers have exploited natural experiments such as sovereign debt index rebalancing episodes (Williams, 2018; Pandolfi and Williams, 2019; Broner et al., 2021), data on U.S. broker-dealers' leverage (Cesa-Bianchi et al., 2018), and confidential BIS banking data to construct granular instruments based on lender-specific shocks (Aldasoro et al., 2023).[3]

[1] Throughout the paper, our focus is on one- to two-year horizons. Unless otherwise noted, we use the term "capital inflows" to refer to gross capital inflows (net foreign purchases of domestic assets) and "capital outflows" to refer to gross capital outflows (net purchases of foreign assets by domestic investors).
[2] Empirical evidence indicates that shifts in expected future productivity and sentiment account for a large share of the variation in gross capital flows (Benhima and Cordonier, 2022). Likewise, the sharp retrenchment in capital inflows during the global financial crisis has been linked to downward revisions in growth expectations (Milesi-Ferretti and Tille, 2011).
[3] Additional identification strategies have relied on external instruments based on global variables, including the VIX and financial conditions in global financial centers (Davis, 2015) and global flows to other emerging markets (Blanchard et al., 2017), or shift–share instruments utilizing bilateral data (Sander, 2023; End, 2024). Endogeneity concerns may also arise in studies focusing on longer-term growth effects of capital inflows, such as those using system GMM estimators (Kose et al., 2009b).

We address this challenge by developing *expectations-based capital inflow shocks* using a simple, transparent and broadly applicable expectations-based framework that isolates the unexpected component of capital inflows. Applying this approach to readily available data on 27 emerging market economies over 1990Q1–2024Q4, we find that capital inflows exert sizable and statistically significant expansionary effects on output.

Our framework for identifying expectations-based capital inflow shocks follows the narrative approach of Romer and Romer (2004) for isolating monetary policy shocks. In their setting, exogenous shocks are obtained by removing the portion of federal funds rate changes predicted by the Federal Reserve's Greenbook forecasts. Analogously, we use Consensus forecasts—professional forecasters' expectations about future economic conditions—to approximate investors' information set.[4]

Consensus forecasts constitute a valuable proxy for the information set underlying investment decisions because professional forecasters and foreign investors are exposed to broadly similar macroeconomic information, including data releases, policy announcements, and developments in domestic and global economic conditions. Although some investors may possess private information at certain points in time, it is unlikely that foreign investors are systematically and consistently better informed than professional forecasters. Moreover, Consensus forecasts, readily available for a reasonably large set of countries, closely track central banks' forecasts, suggesting that they provide a reasonable proxy for the information set of sophisticated economic agents.[5]

The proof, of course, will be in the pudding. We use the forecasts to isolate the component of capital inflows that cannot be explained by expected macroeconomic conditions. Our measure—expectations-purged capital inflow shocks—should be orthogonal to the recipient country's expected domestic macroeconomic developments. As our measure is unlikely to reflect anticipated domestic economic developments, it plausibly captures exogenous capital inflow shocks.

We illustrate in the Online Appendix (OA) how our identification strategy recovers causal effects in a simple small open economy model in which capital inflows respond endogenously to expectations about future macroeconomic conditions. Econometric approaches based on actual capital inflows can confound the causal effect of inflows on output with changes in expectations, while regressions using global instruments likely fail because global financial conditions can affect output directly through channels other than

[4] To our knowledge, this paper is the first to apply the Romer and Romer identification framework to the study the impact of capital flows.
[5] Empirical evidence indicates that forecasts by market participants are highly correlated with central banks' forecasts (Cloyne and Hürtgen, 2016; Holm et al., 2021).

capital flows. The simple model clarifies why purging capital inflows of expectations-driven components can improve identification of their effects on output.

Specifically, we construct expectations-based capital inflow shocks as residuals from country-level regressions of inflows on one-year-ahead forecasts of real GDP growth, inflation, and the current account balance. The resulting residuals capture the portion of inflows not driven by anticipated macroeconomic developments. If these forecasts incorporate information about domestic and global factors affecting output, regressing output on the residuals provides an unbiased estimate of the impact of capital inflows. By removing components of inflows driven by expected domestic conditions and global developments that influence output, our method isolates innovations that are plausibly exogenous with respect to expected economic conditions.[6]

Armed with our new measure of capital inflow shocks, we employ panel local projections to estimate their dynamic effects on macroeconomic and financial variables. We find that unexpected capital inflows have economically meaningful expansionary effects on output. Our analysis of transmission channels shows that these effects operate primarily through stronger consumption and investment and easier financing conditions, despite exchange rate appreciation and weaker net exports.

These findings highlight the contrasting mechanisms emphasized in traditional and modern open economy models and offer empirical evidence on the aggregate effects of capital inflows. Whereas the standard Mundell–Fleming model predicts that inflows appreciate the currency and contract output through a fall in net exports, modern small open-economy dynamic stochastic general equilibrium (DSGE) models generate expansionary effects (e.g., Correia et al., 1995; Cesa-Bianchi et al., 2018; Cuadra and Menna, 2019). In these models, capital inflows stimulate consumption and investment by lowering financing costs, easing borrowing constraints, and raising collateral values through asset-price appreciation, thereby offsetting the contractionary impact of currency appreciation. Our results align with this latter view: for the emerging market economies in our sample, these expansionary forces outweigh the contractionary effects associated with currency appreciation.

To shed light on the heterogeneous effects of different types of capital inflows, we construct separate inflow shocks for FDI, portfolio equity, portfolio debt, and other

[6] Our identifying assumption is conditional orthogonality rather than full structural exogeneity: conditional on forecast variables, residual inflow innovations are assumed to be orthogonal to anticipated domestic macroeconomic developments affecting output.

investment flows and examine their impact on output.[7] We find no evidence that for any category of capital inflows an increase in flows is contractionary. Rather, all major categories exert expansionary effects on output, although the effect of other investment is somewhat weaker and statistically less significant. Notably, equity-type inflows (FDI and portfolio equity) exhibit stronger and more persistent effects than debt-type inflows (portfolio debt and other investment).

These results help reconcile mixed findings in the macro literature, where studies using aggregate data reach divergent conclusions about which flow types are expansionary or contractionary.[8] Our findings also align closely with a growing body of literature at both firm and industry levels, documenting sizable output gains from a wide range of capital inflows, not only from FDI but also from portfolio and bank flows.[9]

We also find evidence of asymmetric and nonlinear effects: large declines in capital inflows (i.e., capital reversals) lead to substantially greater contractions in output than the expansionary effects associated with positive inflows of similar magnitude. These asymmetric and nonlinear patterns are consistent with a substantial body of literature emphasizing the adverse effects of sudden stops (see, e.g., Calvo, 1998; Hutchison and Noy, 2006; and Mendoza, 2010).

We examine the robustness of our findings using several alternative specifications, including net rather than gross flows, the exclusion of the post-pandemic period, and an instrumental-variables approach. We also show that our capital inflow shocks substantially reduce the estimation bias present in regressions using actual inflows by comparing the respective output responses. In addition, we apply our methodology to identify bank-lending shocks and estimate their effects on output, showing that our identification strategy is robust to a different type of capital inflows.

The remainder of the paper is organized as follows. Section 2 outlines the conceptual framework. Section 3 describes the data. Section 4 details the construction of our capital inflow shocks. Section 5 estimates their effects on output and examines the transmission channels. Section 6 analyzes the impact of different types of capital inflows. Section 7

[7] Other investment includes all cross-border financial transactions other than FDI, portfolio flows, and derivatives, and primarily consists of banking and firm-to-firm flows such as loans, deposits, and trade credit.

[8] Empirical evidence using aggregate macroeconomic data on the effects of capital inflows remains mixed, with studies reporting expansionary, contractionary, or insignificant effects depending on inflow type and identification strategy (e.g., Davis, 2015; Blanchard et al., 2017; Aldasoro et al., 2023; End, 2024). More broadly, the literature on the growth effects of financial integration also delivers mixed findings and faces persistent endogeneity concerns (Henry, 2007; Kose et al., 2009a).

[9] This literature provides evidence that capital inflows of different types can boost output through various channels (see, e.g., CGFS, 2021, Bekaert et al., 2005; Larrain and Stumpner, 2017; Varela, 2018; Calomiris et al., 2021; Cingano and Hassan, 2022; and Bau and Matray, 2023).

considers asymmetric and nonlinear output responses to capital inflows. Section 8 presents a broad set of robustness checks. Section 9 concludes. The OA provides greater details and a simple open economy model that motivates our identification strategy.

2. Conceptual Framework

This section outlines the conceptual framework underpinning our analysis. Consider the following reduced form representation of how capital inflows affect output growth:

$$\begin{aligned} \Delta Y_t &= \alpha + \beta CF_t + \epsilon_t \\ &= \alpha + \beta CF_t + \sum_{j=1}^{J} \epsilon_t^j \ , \end{aligned} \tag{1}$$

where Y_t is the logarithm of real GDP (so that ΔY_t denotes real GDP growth), CF_t is a measure of capital inflows, and ϵ_t captures all other factors, $\{\epsilon_t^j\}_{j=1}^{J}$, that might affect GDP growth. Some of the factors in ϵ_t might also be correlated with capital inflows:

$$CF_t = \sum_{j=1}^{J} b_t^j \epsilon_t^j + e_t \ . \tag{2}$$

Equations (1) and (2) together capture that capital inflows impact output growth, but they also respond to factors that can themselves affect output growth. These include domestic pull factors and global push factors.[10] For example, domestic pull factors, including the implementation of growth-enhancing structural reforms, may attract capital inflows. Similarly, global push factors, such as changes in U.S. monetary policy, can affect both output growth and capital inflows. Consistent with this mechanism, there is indeed a positive contemporaneous correlation between capital inflows and GDP growth forecasts, indicating that stronger growth expectations tend to attract more foreign capital (Figures A1 and A2 in the OA).

The implication of these observations is that simply regressing output growth on capital inflows can yield a biased estimate of the effect of capital inflows on output growth, as some components of capital inflows are correlated with the error term in the regression. However, the second equation also captures the idea that certain components of capital inflows are unrelated to factors that can affect output. For instance, the relaxation of

[10] Pull factors reflect domestic conditions that attract capital inflows, while push factors capture external drivers such as global liquidity and risk sentiment (Calvo et al. 1993; Fernandez-Arias 1996). Together, these factors offer a simple framework for classifying the determinants of capital flows and have been shown to be empirically important in explaining their behavior (Koepke, 2019).

restrictions on capital outflows in a source country may lead to an increase in capital inflows to destination countries, even though such regulatory changes need not have any direct bearing on output growth in those recipient countries.

Our identification strategy relies on the assumption that macroeconomic forecasts can be thought of as a function of, or a summary statistic for, $\{\epsilon_t^j\}_{j=1}^J$. For example, output growth forecasts can be considered a projection of output growth based on all available information in period t, including past capital inflows. However, it is reasonable to assume that information about contemporaneous capital inflows is unavailable at the time macroeconomic forecasts are made. Therefore, we construct our new measure of capital inflow shocks by taking the residuals $\hat{e}_t$—the portion of capital inflows unlikely to be correlated with factors directly affecting output growth—after regressing capital inflows on macroeconomic forecasts. Provided that the forecasts reflect developments in domestic and global factors that can affect output growth, a regression of output growth on $\hat{e}_t$ can yield an unbiased estimate of the impact of capital inflows on output growth.

Our approach, which leverages market participants' macroeconomic forecasts to estimate the investor's information set, is analogous to Romer and Romer's (2004) use of the Federal Reserve's internal economic forecasts to capture the Fed's information about future economic developments.[11] They construct a measure of exogenous monetary policy shocks by isolating the component of federal funds rate changes that is orthogonal to the Federal Reserve's Greenbook forecasts of output and inflation. Specifically, they regress intended changes in the federal funds rate on these internal forecasts and interpret the residuals as unanticipated policy shocks—those not driven by the Fed s systemic response to expected macroeconomic conditions.

Similarly, the key idea in our approach is that the identified capital inflow shocks reflect unexpected fluctuations in capital inflows that are uncorrelated with macroeconomic expectations. Consequently, we measure capital inflow shocks as the residuals obtained after regressing capital inflows on macroeconomic forecast data. In his discussion of the Romer and Romer paper, Cochrane (2004) highlights that if the Greenbook forecast of future GDP growth contains all the information used by the Federal Open Market Committee (FOMC) to make its decisions, then that forecast serves as a "sufficient statistic." Similarly, we address reverse causality by using market participants' macroeconomic forecasts as a sufficient statistic. Movements in capital inflows that are

[11] Their approach has also been adopted in some other studies in different contexts (see, e.g., Cloyne and Hürtgen, 2016; Champagne and Sekkel, 2018; Ha, Kim, Kose, and Prasad, 2025).

orthogonal to observed macroeconomic forecasts are less likely to reflect anticipated domestic macroeconomic conditions.

Our identifying assumption is not that the estimated inflow innovations are fully exogenous structural shocks. Rather, conditional on the forecast variables, the residual variation in capital inflows is assumed to be orthogonal to anticipated domestic macroeconomic developments affecting output. Under this assumption, purging inflows of their expectations-driven component substantially mitigates reverse-causality concerns and improves identification of their effects on output.

In the OA, we present a simple small open economy model that highlights the endogeneity of capital inflows and illustrates how our identification strategy recovers their causal effects. The model shows that a simple regression of output on capital inflows is biased because observed inflows contain an endogenous component driven by expectations about future output. The model also clarifies why empirical strategies based on global instruments generally fail to identify the causal effect of capital inflows on output. Global financial conditions affect output not only through capital inflows but also directly through other channels, and global instruments are correlated with expected future output. In contrast, our empirical strategy purges capital inflows of their predictable component using output forecasts, allowing us to isolate exogenous variation in capital inflows and recover their causal effects on output. While imperfect measurement of expectations may attenuate the estimated effects, it is unlikely to reverse their sign.

3. Database

We utilize a wide range of sources to compile a comprehensive dataset.

Economic forecasts. Economic forecasts are sourced from Consensus Economics, which compiles projections from financial institutions on key macroeconomic variables, including real GDP growth, consumer prices, and the current account balance. Consensus forecasts are available for both the current and the following year.[12] A key advantage of using consensus forecasts is that they are consistent over time and comparable across countries. We convert monthly consensus forecasts to quarterly frequency by averaging within each quarter.

Capital flows. We obtain quarterly capital flows by type from BPM6-based data in the IMF's International Financial Statistics (IFS), accessed via Haver Analytics, and

[12] To ensure a constant one-year ahead horizon and avoid breaks in the time series, we construct a synthetic forecast as a month-specific linear combination of current-year and next-year mean consensus projections.

supplement missing observations with BPM5 data. To reduce volatility from fluctuations in the denominator, capital flows are scaled by annualized trend GDP. Specifically, we apply the Hodrick–Prescott filter ($\lambda = 1{,}600$) to the quarterly nominal GDP series in U.S. dollars and annualize the resulting trend by summing the past four quarters.[13]

Macroeconomic and financial series. We obtain macroeconomic and financial data primarily through Haver Analytics. These include real GDP, consumption, investment, exports, imports, foreign exchange rates, the nominal effective exchange rate, short- and long-term interest rates, equity prices, and house prices. Additionally, government debt data are sourced from the IMF Global Debt Database, where public debt is used as the primary measure. If public debt data are unavailable, central government debt is used as a substitute.

Financial development is assessed using the Financial Development Index from the IMF Financial Development Index Database. This index provides a relative ranking of countries based on the depth, access, and efficiency of their financial institutions and markets, with values ranging from 0 to 1. Capital account openness is captured by the Chinn-Ito Index developed by Chinn and Ito (2006). This index quantifies the degree of capital account openness using the first principal component of variables related to regulatory controls on current and capital account transactions.

Country coverage. Our dataset covers 27 emerging market economies from 1990Q1 to 2024Q4.[14] Country selection is primarily driven by data availability over the study period. The country sample includes: Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Croatia, Czech Republic, Estonia, India, Indonesia, Israel, the Republic of Korea, Latvia, Lithuania, Malaysia, Mexico, Peru, the Philippines, Poland, Romania, the Russian Federation, the Slovak Republic, Slovenia, South Africa, Thailand, and Türkiye. Summary statistics are provided in Table C1 and detailed data availability by country and variable is presented in Tables C2–C6 in the OA.

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[13] Our results are robust to the choice of the filtering method. For example, using Hamilton's (2018) linear projection filter or simply summing the past four quarters of nominal GDP yield similar results.

[14] 18 countries are currently classified as emerging market and developing economies (EMDEs) under the World Bank s 2024-25 classification, while 9 countries were classified as EMDEs earlier in the sample period but were later reclassified as advanced economies. Focusing on these economies helps mitigate the issue of high correlation between gross inflows and outflows, as documented by Broner et al. (2013). In many advanced economies and key financial centers, this correlation is especially strong—often close to 1—suggesting that a significant portion of inflows reflects pass-through capital rather than funds directed to the domestic economy.

4. Capital Inflow Shocks

4.1. Identification and Estimation

The first step in deriving our measure of capital inflow shocks is to isolate the portion of capital inflows that responds to macroeconomic forecasts. To achieve this, we estimate the following simple regression for each country in our sample:

$$CF_t = \alpha + \beta_0 CF_{t-1} + \beta_1 E_t[Y_{t+4}] + \beta_2 E_t[\pi_{t+4}] + \beta_3 E_t[CA_{t+4}] + \sum_{k=1}^{3} \delta_k q_k + e_t , \qquad (3)$$

where CF_t denotes capital inflows scaled by annualized trend GDP, $E_t[Y_{t+4}]$ is the one-year-ahead real GDP growth forecast, $E_t[\pi_{t+4}]$ is the one-year-ahead inflation forecast, and $E_t[CA_{t+4}]$ is the one-year-ahead forecast of the current account (CA) balance (as a percentage of GDP). The set $\{q_k\}_{k=1}^{3}$ consists of quarterly dummy variables to control for seasonality. Note that we also utilize inflation and current account balance forecasts. CA balance forecasts offer insights into a country s expected external imbalances, which in turn influence capital flows.

We construct our measure of capital inflow shocks by taking the residuals from equation (3), denoted as $\hat{e}_t$. This series represents the *exogenous* component of capital inflows, as it consists of capital inflows orthogonal to the macroeconomic forecasts. Conversely, we refer to the fitted values from equation (3) as the *endogenous* component of capital inflows, representing the portion predicted by these forecasts.

The objective of this first-stage is to isolate the component of capital inflows associated with anticipated macroeconomic conditions, thereby reducing reverse-causality concerns in subsequent output regressions. Our identification strategy does not rely on the sign or statistical significance of the coefficient on growth forecasts. In some cases, growth forecasts may have little or no impact on capital inflows—a weak or insignificant relationship that can arise for several reasons. First, in countries with highly uncertain macroeconomic environments, forecast quality may be low, reducing their usefulness as predictors of capital flows. Second, capital controls may limit the responsiveness of inflows to growth expectations. Third, underdeveloped financial systems may impede efficient allocation of capital, weakening the link between inflows and forecasts. Finally, in economies dominated by resource-seeking investments, capital inflows may respond more to commodity price movements than to expected growth. In these types of cases, endogeneity concerns are reduced, as capital inflows are less likely to reflect anticipatory responses to future economic conditions.

4.2. Estimation Results

The results from estimating Equation (3) are shown in Table A1. Output growth forecasts are positively correlated with capital inflows, suggesting that higher growth expectations attract more foreign capital. The estimated coefficients are statistically significant for most countries, with a few exceptions. CA balance forecasts exhibit a negative association with capital inflows, as expected. This negative relationship suggests that an anticipated CA deficit signals an increase in external financing needs, leading to higher capital inflows. Finally, the coefficients on inflation forecasts show mixed results and are not statistically significant in many cases.

The R^2 values vary considerably across countries, ranging from 0.1 to 0.5. The average R^2 is about 0.3, indicating that forecasts explain a sizable portion of the variation in capital inflows.[15] Given the strong correlation between economic forecasts and capital inflows, as well as the observed R^2 values, failing to control for expectations can introduce significant omitted variable bias. We indeed observe substantial bias in the estimated impact of capital inflows on output when economic forecasts are not accounted for, a concern that we discuss in detail below. At the same time, the fact that the R^2 values remain well below one suggests that a large portion of fluctuations in gross capital inflows is not related to economic expectations.

To systematically examine the relationship between capital inflows and macroeconomic forecasts, we extend our analysis to panel regressions. Table 1 presents the estimation results. Consistent with the country-level regressions, we find a strong positive relationship between output growth forecasts and capital inflows, and a negative relationship between CA balance forecasts and inflows. Specifically, a one percentage point increase in output growth forecasts is associated with a 0.2–0.3 percentage point increase in the ratio of capital inflows to GDP, while a one percentage point increase in the CA balance-to-GDP forecast corresponds to a 0.1–0.2 percentage point decline in the inflow ratio. The coefficients on inflation forecasts are consistently positive and statistically significant, but their magnitudes are small—around 0.01—indicating that, although a relationship is statistically detectable, the economic relevance of inflation forecasts for explaining capital inflow dynamics is limited.

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[15] The reported R^2 values are relatively high given the limited number of explanatory variables. Studies in the monetary policy literature adopting the Romer and Romer approach typically report R^2 values around 0.3 despite including more than ten variables. Capital flows regressions tend to have very low R^2 values (Cerutti et al. 2019). If the lagged dependent variable and quarterly dummies are excluded, the average R^2 falls to 0.2.

4.3. Features of Capital Inflow Shocks

Our new measures of capital inflow shocks—constructed as the residuals from Equation (3)—represent the exogenous component of capital inflows, capturing the portion orthogonal to expectations.[16] Importantly, the estimated shocks from the first-stage regression do not simply reflect random behavior by foreign investors; rather, they encompass all factors affecting capital inflows not accounted for by our specification. By conditioning on macroeconomic forecasts, we remove the endogenous component of capital inflows associated with anticipated economic developments, whether driven by domestic pull factors or by global push factors that influence domestic economic conditions. The resulting residuals are therefore well suited for studying the causal impact of capital inflows on output. In the analysis below, we show that these shocks are orthogonal to domestic pull factors, while remaining systematically related to global financial conditions.

We do not attempt to explicitly identify the structural sources of these shocks.[17] As long as our measures remain orthogonal to domestic pull factors that directly affect output growth, they serve as valid instruments for estimating the impact of capital inflows on output. While the shocks may correlate with global push factors, they should be uncorrelated with country-specific pull factors. Importantly, any global or domestic factors that directly influence output growth are reflected in changes to macroeconomic forecasts and are thus already accounted for in our framework.

To validate our approach, it is essential to show that our new measures are uncorrelated with domestic pull factors. To this end, we regress our shock measures on five variables commonly considered pull factors: real GDP growth, inflation, government debt to GDP ratio, financial development, and capital account openness.[18] Panel (a) of Table 2 first presents results from regressing actual capital inflows on these same variables. We find that real GDP growth, government debt, and financial development are strongly correlated with capital inflows—as expected, growth and financial development are positively associated with inflows, while higher government indebtedness is negatively associated. The strong positive link between GDP growth and capital inflows underscores

[16] The country-specific series are shown in Figure A3 in the OA.

[17] An analysis not shown here examines the correlation between our shock measures and several global financial indicators, including the U.S. shadow rate, the global financial cycle measure of Miranda-Agrippino and Rey (2020), the VIX, and the risk aversion index of Bekaert et al. (2021). Among these variables, we find that the shocks exhibit a strong positive correlation with the global financial cycle measure.

[18] To convert annual data into quarterly data, the government debt-to-GDP ratio, financial development, and capital account openness are linearly interpolated. Financial development and capital account openness enter the regressions in first differences, as these variables evolve slowly and display pronounced upward trends over time.

the endogeneity problem in estimating the effects of capital inflows on output, as domestic growth is itself a key driver of inflows.

The R^2 in column (6) suggests that domestic pull factors account for about 20% of the variation in capital inflows. Column (7) indicates that global factors also play a role: when time fixed effects are included to capture unobserved common shocks across countries, the R^2 increases by 0.11 (to 0.30 from 0.19). This implies that common global push factors explain an additional 11% of the variation in capital inflows.

We now turn to the regression results using our measures of capital inflow shocks in place of actual capital inflows. Panel (b) of Table 2 presents the estimation results. In contrast to the findings based on actual capital inflows, domestic pull factors jointly explain virtually none of the variation in our estimated shock measures. Although individual coefficients occasionally reach marginal significance, the estimated coefficients are generally small, and the R^2 values remain close to zero when only domestic pull factors are included, indicating that these factors do not drive fluctuations in our capital inflow shocks.

By contrast, the shock measures remain systematically related to global push factors. When time fixed effects are included, the R^2 value increases to 0.13, suggesting that common global financial conditions account for a meaningful share of the variation in our estimated shocks. Overall, the results support our argument that global push factors—rather than domestic pull factors—are the primary source of our estimated shocks.

To further validate our measures as capital inflow shocks, we examine the relationship between domestic pull factors at time t and capital inflows from $t+1$ to $t+8$. While the previous results confirm that our measures of capital inflow shocks are not contemporaneously correlated with domestic pull factors, potential correlations could arise with lags. The regression results using actual capital inflows are presented in Panel (a) of Table 3, while results based on our measures of capital inflow shocks are shown in Panel (b). We again find that domestic pull factors influence future capital inflows: an increase in current GDP growth attracts capital inflows over a two-year horizon, whereas an increase in the government debt-to-GDP ratio reduces future capital inflows.

In contrast, our measures remain uncorrelated with current domestic pull factors for at least one year ahead. The coefficients on GDP growth are close to zero and statistically insignificant up to the one-year horizon. Although the coefficients on GDP growth beyond one year are statistically significant, they are much smaller than those obtained using actual capital inflows, indicating that the endogeneity concerns are largely mitigated. One possible explanation for why the correlation is not fully eliminated is that we use one-year-ahead market forecasts. Consistent with the regression results on contemporaneous correlations, coefficients on other variables remain statistically insignificant or negligible in magnitude, and the R^2 values are much lower compared to those regressions using actual capital inflows.

One potential concern is that our measure may primarily capture time-varying country-specific risk premia or changes in external financing conditions. If this were the case, we would expect it to be systematically related to sovereign spreads, exchange-rate expectations, or interest rate differentials. However, our measure exhibits no statistically significant relationship with any of these variables, whether included separately or jointly (Table A2 in the OA). These results suggest that our measure is not simply capturing fluctuations in country-specific risk premia, expected currency movements, or external financing conditions reflected in these indicators.

Another concern is that our measure may reflect omitted information about future economic fundamentals known to investors but not incorporated into professional forecasts. If this were the case, we would expect positive inflow shocks to systematically predict subsequent upward revisions in growth expectations. However, we find that the relationships between our measure and subsequent forecast revisions are not statistically significant in most specifications after controlling for global growth forecast revisions, changes in the VIX, and realized domestic growth (Table A3 in the OA). These findings suggest that subsequent forecast revisions reflect updates in response to global and domestic economic developments—which may partly include the effects of capital inflow shocks. Thus, the results alleviate concerns that our measure primarily captures omitted information about future fundamentals.[19]

4.4. Behavior of Endogenous vs Exogenous Components

We complement the previous statistical validation with a narrative examination of how the endogenous and exogenous components of capital inflows evolve over the business cycle. The endogenous component corresponds to the predicted values from Equation (3), capturing the portion of inflows explained by economic expectations, whereas the exogenous component consists of the residuals, which we interpret as capital inflow shocks.

We highlight two illustrative country cases—Thailand and Brazil. Figure A4 in the OA shows that periods of strong growth expectations are associated with capital inflows driven largely by the endogenous component, while major global risk-off episodes—such

[19] While this exercise cannot fully rule out the possibility that some long-horizon private information remains embedded in our measure, the evidence suggests that such information is unlikely to be the dominant source of variation in our identified inflow shocks, especially given that our focus is on the short-term macroeconomic effects of capital inflow shocks.

as the Asian Financial Crisis and the Global Financial Crisis—coincide with sharp reversals in the exogenous component. These reversals typically occur abruptly and precede broader declines in the endogenous component, indicating that sudden stops during global shocks are primarily driven by capital inflow shocks rather than gradual adjustments in domestic fundamentals. In contrast, more protracted declines in capital inflows, such as those observed during Brazil's downturn following the commodity price collapse, are mainly linked to movements in the endogenous component reflecting deteriorating domestic growth prospects. Overall, these case studies reinforce our interpretation of the residuals as capturing economically meaningful capital inflow shocks.

5. The Effect of Capital Inflows

We now examine the impact of capital inflows on macroeconomic and financial variables using the identified capital inflow shocks. To flexibly estimate these effects and explore potential nonlinearities, we employ the local projections method proposed by Jordá (2005). This method has the added advantage of being less sensitive to model misspecification than the traditional vector autoregression framework (Montiel Olea et al., 2025). We first estimate the impact on output, highlighting how our approach effectively addresses endogeneity concerns. Subsequently, we examine effects on other macroeconomic and financial variables to better understand the transmission channels through which capital inflows affect output.

5.1. Effect on Output

To examine the effect of capital inflows on output, we estimate the following panel regressions for horizons $h = 0,1,\dots,8$:

$$y_{i,t+h} - y_{i,t-1} = \alpha_i^h + \beta^h \hat{e}_{i,t} + \sum_{k=1}^{K} \beta_k^h \hat{e}_{i,t-k} + \Gamma^h X_{i,t} + \delta_t^h + \varepsilon_{i,t+h}\,, \tag{4}$$

where $y_{i,t+h}$ is the log of real gross domestic product for country i in quarter $t+h$, α_i^h represents country fixed effects to capture time-invariant country characteristics, δ_t^h are time fixed effects to control for time-varying common global macroeconomic shocks, and $\hat{e}$ refers to the measures of capital inflow shocks estimated from Equation (3).

A set of lagged GDP growth and capital outflows is included as control variables in $X_{i,t}$. We include four lags of GDP growth to control for potential autocorrelation, as well as eight lags of capital inflow shocks and capital outflows.[20] Incorporating lagged GDP growth helps account for GDP dynamics and other omitted factors that may influence GDP growth. The lagged values of the shock series are included to capture any delayed effects of the shocks on the dependent variable. Finally, standard errors are double-clustered by country and time to account for potential correlation in the error term, $\varepsilon_{i,t+h}$.

The key parameters of interest are the sequence of local projection impulse responses $\{\beta^h\}$, which measure the percent change in GDP between $t-1$ and $t+h$ in response to a one-percentage-point increase in the ratio of capital inflows to trend GDP in period t over an 8-quarter horizon. The OLS estimation results, along with the 68% and 90% confidence intervals, are presented in Panel (a) of Figure 1. The estimated cumulative effects remain positive and statistically significant throughout the entire horizon. The immediate impact is approximately 0.1 percent, rising steadily over the first four quarters, peaking at 0.2 percent in the fourth quarter, and declining slightly thereafter.[21]

To assess the economic significance of these estimates, we relate the magnitude of the impulse responses to the empirical distribution of capital inflow shocks and output fluctuations. The standard deviation of capital inflow shocks in our sample is 1.7 percentage points of trend GDP. Scaling the impulse responses accordingly implies that a one-standard-deviation inflow shock raises output by about 0.3 percent in the fourth quarter. Relative to the historical distribution of four-quarter real GDP growth, which has a mean of 3.5 percent and a standard deviation of 4.4 percent, this effect is moderate in size but clearly non-negligible, indicating that capital inflow shocks contribute meaningfully to short-run output dynamics.[22]

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[20] While no well-established method exists for determining the optimal number of lags in the local projections (Jordá and Taylor, 2024), Jordá (2023) recommends including a sufficient number of lags to ensure accurate inference in practice. Lag augmentation is a simple way to address residual serial correlation, which can affect the construction of standard errors in local projections. Our results are not sensitive to the specific number of lags chosen.

[21] Our estimation results are comparable to the quantitative exercise of Cuadra and Menna (2019), who develop a small open-economy New Keynesian model in which capital inflows driven by global shocks are expansionary despite the currency appreciation. In their quantitative exercise, a shock that increases capital inflows by 1 percent of annual output raises output by 0.4 percent. Given the rough calibration of their model, this magnitude is broadly comparable to our empirical estimates.

[22] A reasonable concern is that global shocks affect output through channels other than capital flows, thereby contaminating our estimated effects. In this regard, the inclusion of time fixed effects in our baseline specification is critical, as they absorb common global shocks affecting all countries. Moreover, our results remain robust if we (i) replace time fixed effects with observable global factors, including U.S. monetary policy shocks from Bauer and Swanson (2023), VIX, and commodity price changes or (ii) control for EMBI spreads, which capture changes in country-specific risk premia and external financing conditions. (see Figure A5 in the OA). We prefer our baseline specification with time fixed effects, which is the most reliable way to control for global shocks, whereas using a limited set of observable global variables may fail to capture other relevant global disturbances. Moreover, including EMBI spreads, unavailable for some countries and periods, would reduce the sample size.

It is informative to compare the impulse responses obtained using our measure of capital inflow shocks with those obtained under alternative identification strategies. Panels (b)-(d) of Figure 1 contrast our baseline estimates with results based on actual capital inflows and a Blanchard-style global instrument, which instruments domestic capital inflows using global inflows to other emerging markets interacted with country dummies, as in Blanchard et al., (2017).

The naïve specification using actual capital inflows (OLS) substantially overstates the output response, with the peak effect roughly twice as large as the baseline. This upward bias reflects the endogenous response of capital inflows to expectations of future economic conditions, leading the regression to attribute anticipated inflows to exogenous shocks. Estimates based on the global-instrument approach differ sharply from both the baseline and the OLS results. In addition to exhibiting a markedly different dynamic pattern—turning negative at medium horizons—the global-IV estimates are accompanied by considerably wider confidence intervals, indicating substantial estimation uncertainty. This likely reflects weaker instrument relevance, contamination from alternative transmission channels, or both.

Taken together, these comparisons underscore two points. First, failing to account for expectation-driven endogeneity leads to a systematic overstatement of the effects of capital inflows on output. Second, while global instruments aim to address endogeneity, they can introduce substantial imprecision when global factors affect domestic output through channels beyond capital flows. By purging capital inflows of expectation-driven components, our approach delivers more stable and precisely estimated impulse responses, enabling a clearer assessment of the causal effects of capital inflows.

Overall, the results indicate that capital inflows have statistically significant expansionary effects on output and that these effects are not driven by endogeneity bias, as our identification strategy isolates the component of inflows that is orthogonal to economic expectations.

5.2. Transmission Mechanisms

We find that exogenous capital inflows have an expansionary effect on output. A natural next step is to explore the transmission mechanism of this positive effect. To this end, we examine the responses of GDP components and key financial variables to our measure of exogenous capital inflows. Using the same specification employed to estimate the effect on output, we replace the GDP with each variable of interest. Specifically, we analyze investment, private consumption, exports, imports, the nominal effective exchange rate (NEER), foreign exchange rates (FX), equity prices, house prices, and inflation, as well as net exports as a share of GDP, short-term interest rates, and long-term interest rates.

Lagged first differences of the variables are used as control variables when the dependent variable is logged, while lagged levels are included as controls for non-logged dependent variables. As before, we include four lags.

Figure 2 presents the responses of the GDP components, Headline CPI, and several key financial variables to the capital inflow shock. Investment exhibits the strongest response, peaking at around 0.3–0.4 percent during the first year. Private consumption also exhibits a positive response, with a maximum increase of 0.2 percent, comparable to the peak rise in output. Because imports respond strongly and persistently, whereas exports do not respond significantly, net exports (the trade balance) deteriorate by about 0.2 percentage points of GDP.

The headline CPI response exhibits a statistically significant decline, with consumer prices reaching a trough of approximately –0.1 percent after four quarters. This pattern suggests that capital inflows operate in part as a supply-side shock, generating short-run disinflationary pressures by lowering firms' production and financing costs. Cheaper imported inputs, driven by currency appreciation, and reduced borrowing costs both contribute to easing cost pressures, resulting in a temporary decline in consumer prices.

Examining how financial variables such as exchange rates and interest rates respond to capital inflows is crucial, as capital inflows influence the real economy through the exchange rate and credit channels. The first key observation is that capital inflows lead to an appreciation of the currency. The bilateral exchange rate against the U.S. dollar (FX) and the nominal effective exchange rate (NEER) appreciate, although they are not statistically significant. This currency appreciation is consistent with the contraction in net exports shown earlier.[23] Both short-term (3-Month or nearest equivalent) and long-term (10-Year or nearest equivalent) interest rates initially decline but turn insignificant or rise afterward. In terms of magnitude, the response of short-term interest rates is stronger than that of long-term interest rates, indicating that capital inflows primarily reduce short-term financing costs.

Equity prices exhibit a significant increase of about 1 percent in response to capital inflows during the first year. However, these positive effects decline over time and become insignificant after six quarters. This pattern suggests potential overvaluation in the short run, followed by corrections in equity prices. In contrast, house prices grow steadily throughout the examined period, peaking at responses of 0.4 percent. The increase in asset

[23] The results align with the predictions of standard Mundell-Fleming models, which suggest that capital inflows lead to currency appreciation and, consequently, a contraction in net exports (Blanchard et al., 2017).

prices, along with falling interest rates, highlights the role of capital inflows in stimulating domestic financial markets, potentially fueling investment and consumption.

The responses of macroeconomic and financial variables are broadly consistent with modern small open-economy DSGE models, in which capital inflows boost domestic demand by lowering financing costs, relaxing borrowing constraints, and raising collateral values. In these frameworks, stronger domestic demand and currency appreciation lead to higher imports and a worsening trade balance. Our empirical results align with these theoretical mechanisms.

In sum, our estimates indicate that capital inflows have significant expansionary effects on output by stimulating domestic demand and easing financing conditions, despite the accompanying currency appreciation and decline in net exports. These findings deviate from the predictions of the standard Mundell–Fleming model but align with modern small open economy models (e.g., Cesa-Bianchi et al., 2018; Cuadra and Menna, 2019), which generate expansionary effects of capital inflows even in the presence of currency appreciation.[24] Overall, the results suggest that, for the emerging market economies in our sample, capital inflows stimulate domestic demand through lower financing costs and stronger balance sheets to an extent that more than offsets the contractionary effects associated with exchange-rate appreciation and weaker net exports.

6. Effects of Different Types of Capital Inflows

Previous studies have also examined whether different types of capital inflows have distinct effects on recipient economies. Theoretical work generally tends to favor equity-based inflows. For example, Blanchard et al. (2017) argue that bond inflows can be contractionary because they appreciate the currency, whereas non-bond inflows are expansionary as they lower borrowing costs despite the appreciation. Korinek (2018) shows that debt-based flows generate sizable negative pecuniary externalities during financial crises, as large repayment obligations and sharp depreciations exacerbate downturns, whereas equity-based flows are largely benign due to their risk-sharing properties.

Empirical evidence, however, is mixed, with results differing across flow types and empirical strategies. For example, while Blanchard et al. (2017) find that non-bond inflows

[24] In contrast to the standard Mundell-Fleming model, Cesa-Bianchi et al. (2018) demonstrate that appreciation can instead amplify the expansionary effects of capital inflows: higher inflows raise house prices and the real exchange rate, increasing collateral values, relaxing borrowing constraints, and boosting consumption and output.

are expansionary and bond inflows contractionary, Davis (2015) reports opposite results. These discrepancies likely reflect differences in instruments, identification strategies, and sample composition across studies.[25] To help reconcile these mixed findings, we use disaggregated capital-flow data that distinguish among FDI, portfolio equity, portfolio debt, and other investment.

We construct capital inflow shocks separately by each type by running the first-stage regressions at the country level for each flow category.[26] To systematically assess the relationship between each type of capital inflow and economic forecasts, we also conduct panel regressions. The results, shown in Table 4, indicate that FDI and other investment inflows exhibit similar relationships with growth expectations as total capital inflows, suggesting that higher growth expectations attract more foreign capital in these forms. In contrast, portfolio equity and debt inflows display weak or insignificant relationships with growth expectations. The R^2 values further suggest that domestic economic forecasts explain a substantial portion of the variation in FDI and other investment inflows but account for little of the fluctuations in portfolio investment inflows.

FDI inflows show a strong relationship with growth expectations because investors acquire long-term stakes in businesses and base their decisions on expected sustained expansion. Other investment inflows respond similarly, as cross-border banking activities and trade credit tend to rise when higher expected growth signals stronger demand for credit and improved balance sheets. In contrast, portfolio inflows exhibit only a weak relationship with growth expectations due to their high liquidity and greater sensitivity to short-term factors such as global risk sentiment, interest rate differentials, and financial conditions. Because FDI and other investments are relatively illiquid and costly to reverse, investors in these categories rely more heavily on long-term fundamentals before committing capital. Portfolio investors, however, may even view weaker growth expectations as an opportunity if asset prices adjust downward, reinforcing the limited link between portfolio flows and one-year-ahead GDP forecasts.

Next, we examine the effects of each type of capital inflow on output using our identified capital inflow shocks. Instead of total capital inflow shocks, we include all types of capital inflow shocks in Equation (4), controlling for GDP growth lags and

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[25] For instance, Blanchard et al. (2017) use a sample of 19 emerging market economies over 2000–2014 in a panel-regression framework, whereas Davis (2015) analyzes a mixed sample of 16 advanced economies and 14 emerging market economies over 2005Q1–2013Q4 using a structural VAR model. The instrument sets also differ: Blanchard et al. (2017) use global flows to other emerging markets, while Davis (2015) relies on the VIX and financial conditions in major financial centers. Aldasoro et al. (2023), however, show that such instruments based on global financial conditions can yield substantial bias and may even reverse the sign of the impact.

[26] The first-stage regression results are presented in Tables A4-7 in the OA.

corresponding capital outflows. Figure 3 presents the impulse responses. The results indicate that all types of capital inflows are expansionary. While the effects are similar across flow types, FDI inflows exhibit somewhat stronger and more persistent effects, peaking at 0.3 percent after three quarters and remaining at that level. Portfolio equity inflows also sizeable short-run effects—peaking at roughly 0.4 percent within the first year—though the estimates are no longer statistically significant at longer horizons. Debt-based inflows—portfolio debt inflows and other investment inflows—also have expansionary effects, reaching 0.1–0.3 percent, though the effect of other investment is smaller and statistically insignificant.[27]

When we conduct a similar exercise by distinguishing capital inflows into two types—equity-type inflows (FDI and portfolio equity) and debt-type inflows (portfolio debt and other investment)—we find that equity-type inflows have stronger and more persistent expansionary effects. Figure 4 shows that GDP responds more quickly and more strongly to equity-type inflows, with the cumulative effect peaking around 0.3 percent after three quarters and remaining elevated throughout the horizon. In contrast, the response to debt-type inflows is more modest and short-lived, peaking around 0.15 percent and gradually tapering off. While both types of capital inflows have statistically significant positive effects on output, these results suggest that equity-type flows are more effective in supporting sustained economic expansion. Overall, we find no evidence that any type of capital inflows is contractionary, though their expansionary effects differ by flow type.

Taken together, these results bring coherence to the mixed evidence in the existing literature. Once we isolate the unexpected component of capital inflows, none of the major flow types appear contractionary in the short run.[28] At the same time, the stronger and

[27] We also find that the transmission mechanisms differ across types of capital inflows. Figure A6 in the OA presents the responses of GDP components and key financial variables to each inflow category. All types of inflows stimulate investment and consumption, although the magnitude and persistence of the responses differ. The effects on interest rates, exchange rates, and asset prices vary across flow types. FDI inflows tend to lower long-term interest rates and raise both equity and house prices. Portfolio equity inflows primarily boost equity prices, whereas portfolio debt inflows mainly reduce interest rates. Other investment inflows do not appear to lower interest rates but do increase asset prices modestly. In contrast to other types of capital inflows, other investment inflows have no significant short-run impact on the exchange rate but lead to depreciation after four to five quarters. This pattern can be explained by hedging motives of financial intermediaries—where currency exposures are offset in offshore markets—and with the repayment pressures associated with short-term liabilities during periods of tightening financial conditions. Finally, equity-type inflows do not reduce exports in the short run; if anything, exports rise slightly, even though net exports decline due to stronger import demand. This pattern may indicate that equity inflows are more likely to be allocated toward the tradable sector, whereas debt-type inflows disproportionately support spending in the non-tradable sector.

[28] These findings are also consistent with studies focusing on specific categories and document expansionary effects—for example, international bank lending (Aldasoro et al., 2023) and equity portfolio inflows (Sander, 2023).

more persistent effects of equity-type inflows are consistent with theoretical mechanisms emphasizing their benefits through risk-sharing, balance-sheet strengthening, and lower repayment pressures. Our findings also align with a growing firm- and industry-level literature documenting substantial benefits from a wide range of foreign capital inflows—not only FDI, but also more volatile portfolio and bank inflows (CGFS, 2021).[29]

7. Asymmetric and Nonlinear Effects

We now explore whether the effects of capital inflows are asymmetric or nonlinear. The sudden-stop literature emphasizes that capital flow reversals can trigger disproportionately large contractions in output. In models with occasionally binding borrowing constraints (e.g., Mendoza, 2010; Bianchi, 2011; Korinek and Mendoza, 2014), negative shocks—capital outflows or reversals—tighten financial constraints, trigger fire sales, and lead to sharp declines in economic activity, whereas positive shocks generate more modest expansions. Motivated by these theoretical insights, we examine whether similar asymmetric and nonlinear patterns emerge in the data.

We first assess whether positive and negative capital inflows of the same magnitude have symmetric effects. Figure 5 shows that negative inflows—that is, net selling of domestic assets by foreign investors—produce substantially larger contractions than the expansions generated by positive inflows. Although the immediate effects appear roughly symmetric, the divergence becomes evident over time: a one-percentage-point decline in the ratio of capital inflows to annualized trend GDP leads to a peak GDP drop of roughly 0.3 percent—almost three times the 0.1 percent increase associated with an equally sized positive inflow.

We then investigate whether the magnitude of shocks matters for output dynamics. To do so, we classify capital inflow shocks into five bins based on country-specific standard deviations (s.d.): less than –1 s.d., –1 to –0.25 s.d., –0.25 to 0.25 s.d., 0.25 to 1 s.d., and greater than 1 s.d. This binning reduces sensitivity to outliers and allows us to trace nonlinearities. The omitted category includes shocks between –0.25 and 0.25 s.d., which we interpret as neutral inflows.

[29] While these micro-level studies primarily examine medium- to long-run outcomes—such as productivity gains, improved resource allocation, and innovation, which unfold over longer horizons—they nonetheless provide broader support for the view that foreign capital can enhance economic performance. The mechanisms emphasized in this literature (e.g., Bekaert et al., 2005; Larraín and Stumpner, 2017; Varela, 2018; Calomiris et al., 2021; Cingano and Hassan, 2022; Bau and Matray, 2023) complement our short-run results by showing that various forms of foreign capital improve firm- and sector-level outcomes once frictions are relaxed, consistent with the expansionary short-run effects we document.

Figure 6 displays the cumulative GDP responses associated with each shock magnitude, with Table 5 reporting the corresponding coefficients. The results provide evidence of nonlinearity. Larger positive inflows generate only modest incremental gains beyond those associated with neutral inflows, whereas large negative shocks are followed by steep and persistent contractions. These patterns are consistent with the convex response predicted by models with occasionally binding constraints: when inflows dry up sharply, borrowing limits bind, balance sheets deteriorate, and output falls more than proportionally; by contrast, when inflows increase, the gains are more moderate because the economy is often operating away from its constraints. The empirical evidence therefore aligns closely with theoretical frameworks and earlier work documenting the large real costs of capital flow reversals (Calvo, 1998; Hutchison and Noy, 2006; Mendoza, 2010).

8. Robustness

We test the robustness of our findings by examining their sensitivity to several alternative approaches and datasets. We consider a range of specification changes—including using net instead of gross capital flows, excluding the post-pandemic period, and employing an instrumental-variables approach. We also apply our identification strategy to a dataset of international bank-lending flows, enabling us to test the methodology on a different type of capital flows. Across these exercises, our headline results remain robust to variations in model specification and sample choice.

Using Net Capital Flows: We applied our first-stage regressions to gross capital inflows. Alternatively, we could construct a measure of net capital flows under the assumption that both foreign and domestic residents respond similarly to economic forecasts. Using net capital flows could help address the issue of the high correlation between gross capital inflows and outflows, as documented by Broner et al. (2013). In many advanced economies and key global financial centers, this correlation is particularly strong—often close to 1—suggesting that a significant portion of inflows may represent pass-through capital rather than funds genuinely directed to the recipient country. This issue is mitigated in our exercise, as we focus on emerging market economies and exclude economies exhibiting high correlations. However, using net capital flows could further mitigate this concern. Additionally, from the recipient country s perspective, what ultimately matters may simply be net capital inflows. Thus, it is meaningful to examine whether the results differ when using net capital inflows instead of gross capital flows.

The first-stage regression results are similar to those obtained using gross capital inflows (see Table A8 in the OA). Output growth forecasts are positively associated with net capital inflows, suggesting that higher growth expectations attract more capital. CA balance forecasts are negatively related to net capital inflows, while inflation forecasts yield mixed results and are often statistically insignificant at the 10% level. The average R^2 is 0.36, indicating that economic forecasts account for more than one-third of the variation in net capital flows. We find that impulse responses to net capital flow shocks are nearly identical to the baseline results (Panel (a) of Figure 7), suggesting that the estimation results using gross capital inflows while controlling for gross capital outflows are consistent with those obtained using net capital inflows in our sample.

Excluding the Post-Pandemic Period: The COVID-19 pandemic introduced unprecedented disruptions to global financial markets and economies, significantly altering capital flow dynamics and their macroeconomic effects. To ensure our findings are not driven by the unique characteristics of the post-pandemic period, we re-estimate our models by excluding data after 2020Q1. This approach allows us to assess whether the observed relationships between capital inflows and macroeconomic variables hold in a more stable economic environment, largely unaffected by the exceptional shocks and policy interventions triggered by the pandemic.

To this end, we exclude the post-pandemic period from the first-stage regressions used to construct the measures of capital inflow shocks. The approach completely removes the influence of the post-pandemic period, allowing us to assess the robustness of our findings to the exclusion of this extraordinary time frame. The results, presented in Panel (b) of Figure 7, indicate that our findings remain robust when the post-pandemic period is excluded.

Instrumental Variables Approach: Recent studies use identified exogenous movements in the shock of interest as instrumental variables rather than treating them as primitive structural shocks. In the context of the vector autoregression (VAR) framework, the proxy SVAR method—which incorporates exogenous variation in the shock of interest estimated outside the VAR model for identification—has been widely used following Stock and Watson (2012), Mertens and Ravn (2013 and 2014). In many applications, exogenous measures are constructed as proxies for the shock of interest. However, as discussed in Mertens and Ravn (2014) and Stock and Watson (2018), these constructed measures often contain measurement error. Such errors can lead to bias if the measure is treated as the true shock, as they are noisy approximations of the underlying structural shock. Mertens and Ravn (2014) argue that the instrumental variable (IV) approach is more robust to various types of measurement error.

A similar approach has been developed in the context of the local projections method, known as LP-IV, which has been widely used since Jorda, Schularick, and Taylor (2015).[30] We test the robustness of our results by using our measures as external instruments, acknowledging that they are also subject to measurement error. The impulse response functions from this robustness check are notably similar to the baseline findings (Panel (c) of Figure 7). We therefore conclude that any potential bias stemming from measurement error in our baseline results is minimal.

Panel (d) of Figure 7 compares the response of real GDP in our baseline specification to three alternative approaches discussed above. Across all cases, the impulse responses are remarkably similar in both magnitude and dynamics. This consistency confirms that the estimated expansionary effect of capital inflows on output is robust to variations in model specification and sample choice.[31]

Other Robustness Checks: We conduct several additional robustness exercises. First, we apply the corrected local projection approach proposed by Teulings and Zubanov (2014), which incorporates forward shocks within the estimation horizon. As they note, omitting information within the horizon can bias local projection estimates. Figure A8 in the OA shows that the estimated responses based on our capital inflow shocks are robust to whether standard or corrected local projections are used, whereas estimates based on actual capital inflows or global instrumental variables are considerably more sensitive to this choice. Second, we verify that our results are robust to excluding the Global Financial Crisis period (2009–10). Third, we examine impulse responses over longer horizons of three and four years. The responses remain very similar to the baseline over the first two years but become statistically insignificant beyond that horizon.

Finally, we validate our methodology by applying our identification strategy to the data of international bank-lending flows from the BIS Locational Banking Statistics by Residence (LBSR) for 22 EMEs over 1990Q1–2018Q4. This is the same database employed by Aldasoro et al. (2023) (ABGM, hereafter). This exercise provides an out-of-sample test of our approach in a completely different empirical setting, using a distinct type of capital flow. Using their data, we construct our measure of exogenous bank-lending shocks and estimate their effects in the same local-projection framework employed by ABGM.

This validation exercise is particularly informative because it allows us to assess how closely our method can recover the causal effect estimated by a benchmark approach. While the true causal effect is unknown, we treat the granular lender-specific instrument

[30] One advantage of IV estimation in local projections over VARs is that identification can be achieved even in non-invertible settings (Stock and Watson, 2018; Plagborg-Møller and Wolf, 2022).
[31] The responses of key macroeconomic and financial variables are also robust (see Figure A7 in the OA).

used by ABGM as a benchmark and evaluate whether our method delivers comparable dynamics. As shown in Figure D1 in the OA, the estimated output responses obtained using our identification strategy align closely with those reported by ABGM, both in terms of magnitude and timing: international bank-lending shocks generate a short-run expansion that peaks around the third quarter and gradually fades thereafter. This close correspondence indicates that our expectations-based method performs well outside our baseline dataset and can recover effects consistent with those from an established benchmark. Overall, this out-of-sample validation provides strong support for the reliability of our methodology. Further details are provided in the OA.

9. Conclusions

We develop a simple, transparent, and broadly applicable expectations-based framework for identifying the causal effects of capital inflows on short-term economic activity. By purging movements in capital inflows predicted by professional forecasters' growth expectations, we isolate unexpected inflow shocks that are plausibly exogenous to domestic macroeconomic conditions. Applying this approach to 27 emerging market economies over more than three decades, we find that capital inflows have sizable and statistically significant expansionary effects on output, operating primarily through stronger domestic demand and easier financing conditions despite currency appreciation.

Our results shed new light on long-standing debates about the macroeconomic implications of capital flows. The expansionary effects we uncover are consistent with modern small open-economy DSGE models, where capital inflows relax borrowing constraints, lower financing costs, and boost consumption and investment, rather than the contractionary outcomes predicted by the traditional Mundell–Fleming model. We find no evidence that any category of capital inflows is contractionary. Instead, all major categories exert expansionary effects on output, although the effect of other investment is somewhat weaker and statistically less significant. Notably, equity-type inflows exhibit stronger and more persistent effects than debt-type inflows. We also document pronounced asymmetries, with inflow reversals generating much larger output contractions than the expansions associated with increases in inflows of similar magnitude.

Beyond providing new empirical evidence, our identification strategy offers a scalable and data-efficient framework for studying the macroeconomic effects of cross-border capital movements. By circumventing the limitations of approaches that rely on confidential bilateral positions or narrowly defined flow categories, the framework can be readily applied to a wide range of settings, including other forms of cross-border finance, interactions with financial frictions, and the role of global risk cycles. An important avenue for future research is to combine this approach with micro-level credit data to study transmission mechanisms in greater detail—for example, by examining which financing costs adjust, which types of firms benefit, how effects differ across sectors, and whether lending terms respond. Future work may also leverage this framework to analyze the interaction between capital inflows and macroprudential policies, as well as the implications of capital inflows for longer-term growth outcomes.

References

Aldasoro, I., Beltrán, P., Grinberg, F., and Mancini-Griffoli, T. (2023). "The macro-financial effects of international bank lending on emerging markets." *Journal of International Economics*, 142: 103733.

Bau, N. and Matray, A. (2023). "Misallocation and Capital Market Integration: Evidence from India." *Econometrica*, 91(1): 67–106.

Bauer, M. and Swanson, E. (2023). "A Reassessment of Monetary Policy Surprises and High-Frequency Identification." *NBER Macroeconomics Annual* 37: 87-155.

Bekaert, G., Engstrom, E.C., and Xu, N.R. (2021). "The time variation in risk appetite and uncertainty." *Management Science*, 68(6): 3975-4004.

Bekaert, G., Harvey, C.R., and Lundbald, C. (2005). "Does Financial Liberalization Spur Growth?" *Journal of Financial Economics*, 77(1): 3–55.

Benhima, K. and Cordonier, R. (2022). "News, sentiment and capital flows." *Journal of International Economics*, 137: 103621.

Bianchi, J. (2011). "Overborrowing and systemic externalities in the business cycle." *American Economic Review*, 101(7): 3400-3426.

Blanchard, O., Ostry, J.D., Ghosh, A.R., and Chamon, M. (2017). "Are capital inflows expansionary or contractionary? Theory, policy implications, and some evidence." *IMF Economic Review*, 65(3): 563–585.

Broner, F., Didier, T., Erce, A., and Schmukler, S.L. (2013). "Gross capital flows: dynamics and crises." *Journal of Monetary Economics*, 60(1): 113–133.

Broner, F., Martin, A., Pandolfi, L., and Williams, T. (2021). "Winners and losers from sovereign debt inflows." *Journal of International Economics*, 130: 103446.

Calomiris, C.W., Larrain, M., and Schmukler, S.L. (2021). "Capital Inflows, Equity Issuance Activity, and Corporate Investment." *Journal of Financial Intermediation*, 46: 100845.

Calvo, G.A. (1998). "Capital flows and capital-market crises: the simple economics of sudden stops." *Journal of Applied Economics*, 1(1): 35–54.

Calvo, G.A., Leiderman, L., and Reinhart, C.M. (1993). "Capital inflows and real exchange rate appreciation in Latin America: the role of external factors." IMF Staff Papers, 40(1): 108–151.

Cerutti, E., Claessens, S., and Rose, A. (2019). "How important is the Global Financial Cycle? Evidence from Capital Flows." *IMF Economic Review* 67: 24-60.

Cesa-Bianchi, A., Ferrero, A., and Rebucci, A. (2018). "International credit supply shocks." *Journal of International Economics*, 112: 219–237.

Champagne, J. and Sekkel, R. (2018). "Changes in monetary regimes and the identification of monetary policy shocks: Narrative evidence from Canada." *Journal of Monetary Economics*, 99: 72–87.

Chinn, M.D. and Ito, H. (2006). "What matters for financial development? Capital controls, institutions, and interactions." *Journal of Development Economics*, 81(1): 163–192.

Cingano, F. and Hassan, F. (2022). "International financial flows and misallocation: evidence from micro data." CEPR Discussion Paper No. 17186. CEPR Press, Paris & London.

Cloyne, J. and Hürtgen, P. (2016). "The macroeconomic effects of monetary policy: a new measure for the United Kingdom." *American Economic Journal: Macroeconomics*, 8(4): 75–102.

Cochrane, J. (2004). "Comment on 'A new measure of monetary shocks: derivation and implications' by Christina Romer and David Romer." Presented at NBER EFG Meeting, July 17, 2004.

Coibion, O. and Gorodnichenko, Y. (2026). Expectations matter: The new causal macroeconomics of surveys and experiments. Princeton University Press.

Committee on the Global Financial System (2021). "Changing patterns of capital flows." CGFS Papers, Bank for International Settlements, Basel.

Correia, I., Neves, J.C., and Rebelo, S. (1995). "Business cycles in a small open economy." *European Economic Review*, 39: 1089-1113.

Cuadra, G. and Menna, L. (2019). "Capital flows and the business cycle." *Journal of Economic Dynamics & Control*, 106: 103717.

Davis, J.S. (2015). "The macroeconomic effects of debt- and equity-based capital inflows." *Journal of Macroeconomics*, 46: 81–95.

End, N. (2024). "Fueling or following growth? Causal effects of capital inflows on recipient economies." IMF Working Paper WP/24/15, International Monetary Fund, Washington, DC.

Fernández-Arias, E. (1996). "The new wave of private capital inflows: push or pull?" *Journal of Development Economics*, 48(2): 389–418.

Ha, J., Kim, D., Kose, M.A., and Prasad, E.S. (2025). "Resolving puzzles of monetary policy transmission in emerging markets." *European Economic Review*, 173: 104957.

Hamilton, J.D. (2018). "Why you should never use the Hodrick-Prescott filter." *Review of Economics and Statistics*, 100(5): 831-843.

Henry, P.B. (2007). "Capital account liberalization: theory, evidence, and speculation." *Journal of Economic Literature*, 45(4): 887–935.

Holm, M.B., Paul, P., and Tischbirek, A. (2021). "The transmission of monetary policy under the microscope." *Journal of Political Economy*, 129(10): 2861-2904.

Hutchison, M.M. and Noy, I. (2006). "Sudden stops and the Mexican wave: currency crises, capital flow reversals and output loss in emerging markets." *Journal of Development Economics*, 79: 225-248.

Jordá, Ò. (2005). "Estimation and inference of impulse responses by local projections." *American Economic Review*, 95(1): 161–182.

Jordá, Ò. (2023). "Local projections for applied economics." *Annual Review of Economics*, 15: 607–631.

Jordá, Ò. and Taylor, A.M. (2024). "Local projections." NBER Working Paper, 32822.

Jordá, Ò., Schularick, M., and Taylor, A.M. (2015). "Betting the house." *Journal of International Economics*, 96(S1): S2–S18.

Kalemli-Özcan, S. and Varela, L. (2026). "Five facts about the UIP premium." Unpublished Working Paper.

Koepke, R. (2019). "What drives capital flows to emerging markets? A survey of the empirical literature." *Journal of Economic Surveys*, 33(2): 516–540.

Korinek, A. (2018). "Regulating capital flows to emerging markets: An externality view." *Journal of International Economics*, 111: 61-80.

Korinek, A. and Mendoza, E.G. (2014). "From sudden stops to Fisherian deflation: Quantitative theory and policy." *Annual Review of Economics*, 6: 299-332.

Kose, M.A., Prasad, E.S., Rogoff, K., and Wei, S-J. (2009a). "Financial globalization: a reappraisal." *IMF Staff Papers*, 56(1): 8–62.

Kose, M.A., Prasad, E.S., and Terrones, M.E. (2009b). "Does openness to international financial flows raise productivity growth?" *Journal of International Money and Finance*, 28(4): 554–580.

Larrain, M. and Stumpner, S. (2017). "Capital account liberalization and aggregate productivity: The role of firm capital allocation." *Journal of Finance*, 72(4): 1825–1858.

Mendoza, E.G. (2010). "Sudden stops, financial crises, and leverage." *American Economic Review*, 100: 1941-1966.

Mertens, K. and Ravn, M.O. (2013). "The dynamic effects of personal and corporate income tax changes in the United States." *American Economic Review*, 103(4): 1212–1247.

Mertens, K. and Ravn, M.O. (2014). "A reconciliation of SVAR and narrative estimates of tax multipliers." *Journal of Monetary Economics*, 68: S1–S19.

Milesi-Ferretti, G.M. and Tille, C. (2011). "The great retrenchment: international capital flows during the global financial crisis." *Economic Policy*, 26(66): 289-346.

Miranda-Agrippino, S. and Rey, H. (2020). "U.S. monetary policy and the global financial cycle." *Review of Economic Studies*, 87: 2754-2776.

Montiel Olea, J.L., Plagborg-Møller, M., Qian, E., and Wolf, C.K. (2025). "Local Projections or VARs? A Primer for Macroeconomists." NBER Working Paper, 33871.

Pandolfi, L. and Williams, T. (2019). "Capital flows and sovereign debt markets: Evidence from index rebalancings." *Journal of Financial Economics*, 132(2): 384–403.

Plagborg-Møller, M. and Wolf, C.K. (2022). "Instrumental variable identification of dynamic variance decompositions." *Journal of Political Economy*, 130(8): 2164–2202.

Romer, C.D. and Romer, D.H. (2004). "A new measure of monetary shocks: Derivation and implications." *American Economic Review*, 94(4): 1055–1084.

Sander, N. (2023). “The macroeconomic effects of portfolio equity inflows.” Staff Working Paper 2023-31, Bank of Canada.

Stock, J.H. and Watson, M.W. (2012). “Disentangling the channels of the 2007-2009 recession.” NBER Working Paper, 18094.

Stock, J.H. and Watson, M.W. (2018). “Identification and estimation of dynamic causal effects in macroeconomics using external instruments.” *Economic Journal*, 128(610): 917–948.

Svirydzenka, K. (2016). Introducing a new broad-based index of financial development. IMF Working Paper WP/16/5, International Monetary Fund, Washington, DC.

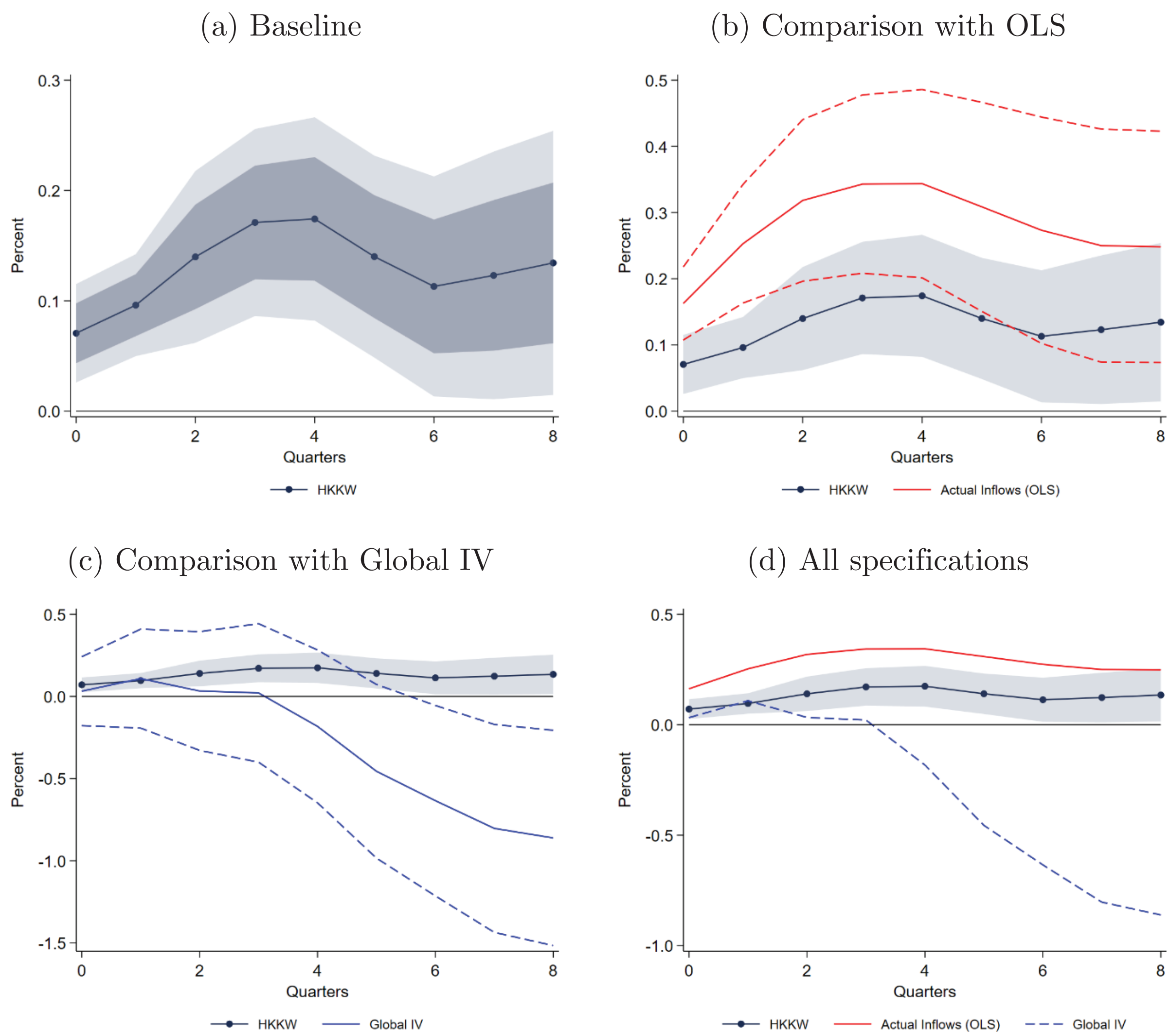
Teulings, C.N. and Zubanov, N. (2014). “Is economy recovery a myth? Robust estimation of impulse responses.” *Journal of Applied Econometrics*, 29(3): 497–514.

Varela, L. (2018). “Reallocation, Competition, and Productivity: Evidence from a Financial Liberalization Episode.” *Review of Economic Studies*, 85: 1279–1313.

Williams, T. (2018). “Capital inflows, sovereign debt and bank lending: micro-evidence from an emerging market.” *Review of Financial Studies*, 31(12): 4958–4994.

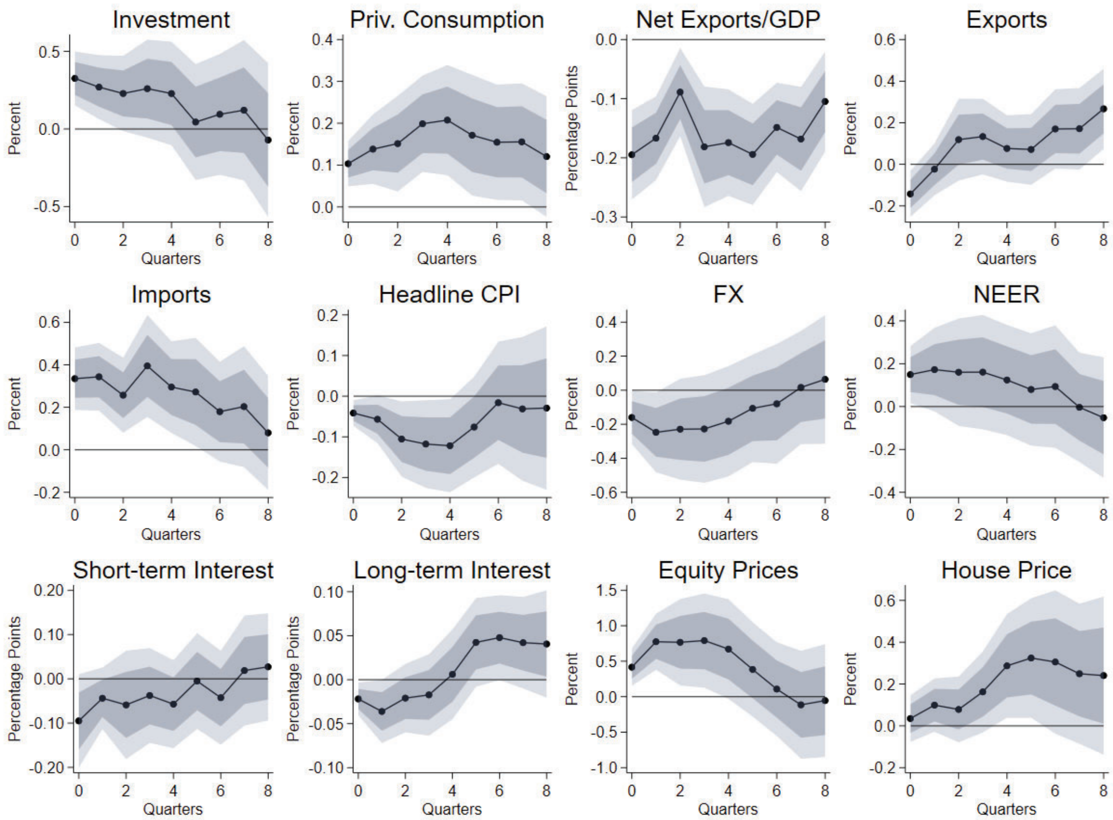
Figures

Figure 1. Output responses to capital inflows: baseline vs alternative approaches



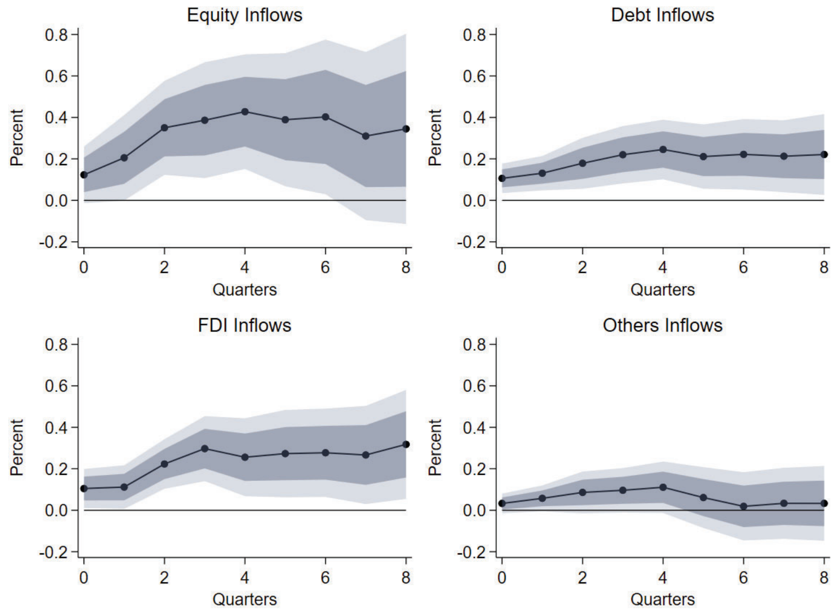
Note: This figure shows the cumulative response of real GDP to a one-percentage-point increase in the ratio of capital inflows to annualized trend GDP over an 8-quarter horizon. “HKKW” denotes our baseline estimates based on capital inflow shocks purged of expectation-driven components. “Actual inflows (OLS)” reports estimates from a regression using actual capital inflows, while “Global IV” uses an instrumental-variable strategy following Blanchard et al. (2017). Shaded areas in panel (a) indicate 68% and 90% confidence intervals. In the remaining panels, shaded areas and dashed lines indicate 90% confidence intervals. Confidence intervals are computed using standard errors double-clustered by country and time.

Figure 2. Impulse responses to capital inflow shocks



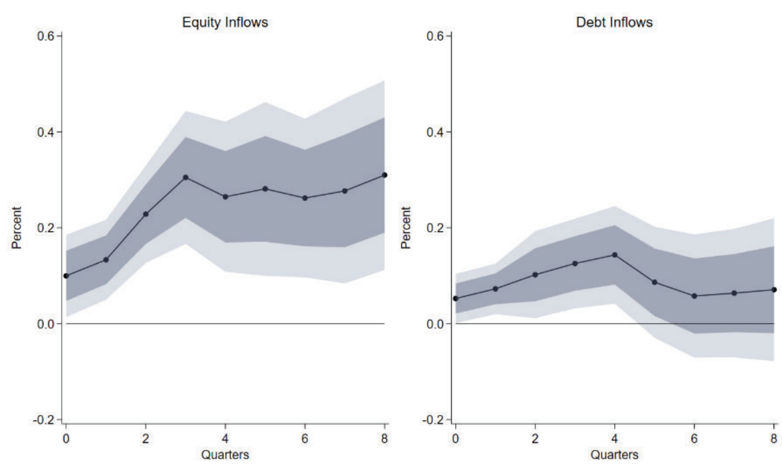
Note: This figure shows the cumulative response to a one-percentage-point increase in the ratio of capital inflows to annualized trend GDP over an 8-quarter horizon. Shaded areas are 68% and 90% confidence intervals computed from standard errors double-clustered on country and time.

Figure 3. Impulse responses of output to capital inflow shocks by flow type



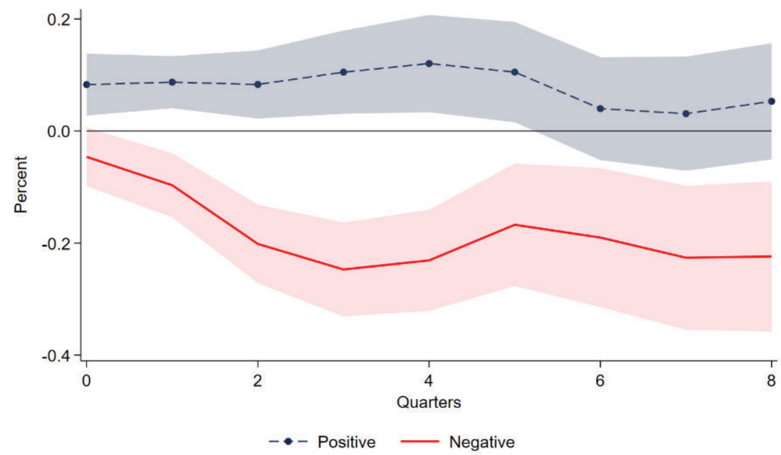
Note: This figure shows the cumulative responses of real GDP to a one-percentage-point increase in the ratio of each type of capital inflows to annualized trend GDP over an 8-quarter horizon. Shaded areas are 68% and 90% confidence intervals computed from standard errors double-clustered on country and time.

Figure 4. Impulse responses of output to capital inflow shocks: equity vs debt



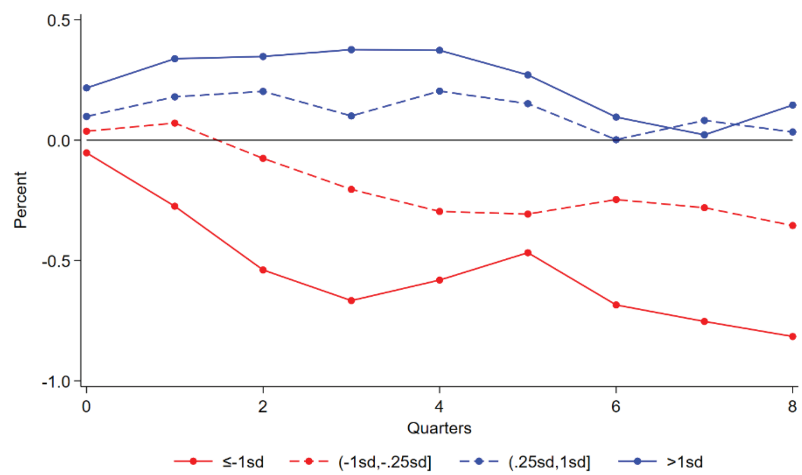
Note: This figure shows the cumulative responses of real GDP to a one-percentage-point increase in the ratio of equity-type (left) or debt-type (right) capital inflows to annualized trend GDP over an 8-quarter horizon. Equity-type flows are the sum of direct investment and portfolio equity investment. Debt-type flows are the sum of portfolio debt investment and other investment. Shaded areas are 68% and 90% confidence intervals computed from standard errors double-clustered on country and time.

Figure 5. Asymmetric effects of capital inflow shocks on output



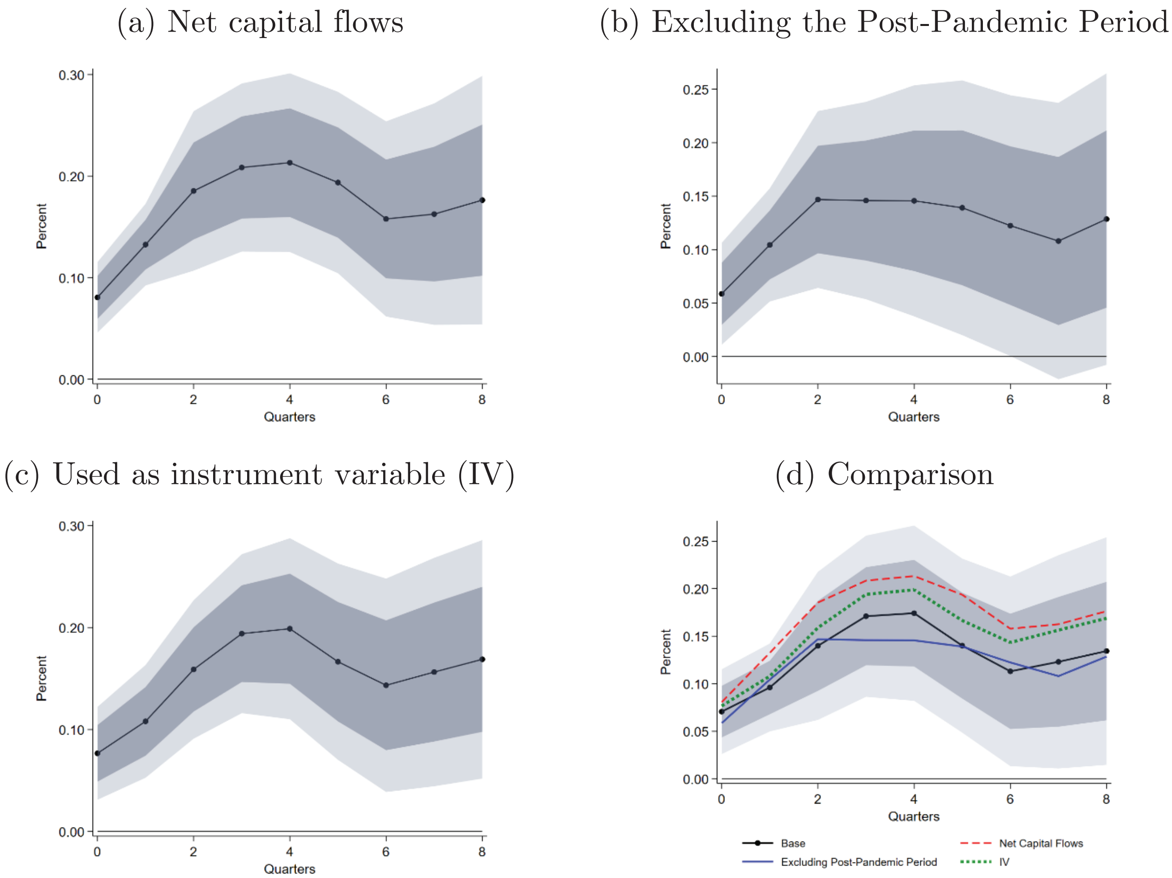
Note: This figure shows the cumulative responses of real GDP to a one-percentage-point change in the ratio of capital inflows to annualized trend GDP over an 8-quarter horizon. Shaded areas are 68% confidence intervals computed from standard errors double-clustered on country and time.

Figure 6. Nonlinear effects of capital inflow shocks on output



Note: This figure shows the cumulative responses of real GDP to each bin of capital inflow shocks, relative to the omitted bin. Capital inflow shocks are divided into five bins based on country-specific standard deviation (s.d.): less than -1 s.d., -1 s.d. to -0.25 s.d., -0.25 s.d. to 0.25 s.d., 0.25 s.d. to 1 s.d., and greater than 1 s.d. The omitted bin corresponds to capital inflow shocks between -0.25 and 0.25 s.d.

Figure 7. Robustness: Impulse responses of output to capital inflow shocks



Note: This figure shows the cumulative responses of real GDP to a one-percentage-point increase in the ratio of capital inflows to annualized trend GDP over an 8-quarter horizon. Shaded areas are 68% and 90% confidence intervals computed from standard errors double-clustered on country and time. In Panel (d), the shaded areas correspond to the confidence intervals of the baseline specification only.

Tables

Table 1. Panel regressions: Capital inflows and economic forecasts

	(1)	(2)	(3)	(4)
CF_{t-1}	0.20***	0.17***		
	(0.03)	(0.02)		
GDP Growth	0.24***	0.22***	0.29***	0.26***
	(0.05)	(0.05)	(0.06)	(0.05)
Inflation	0.01**	0.01**	0.01**	0.01**
	(0.00)	(0.00)	(0.00)	(0.01)
CA Balance	-0.12***	-0.14***	-0.15***	-0.18***
	(0.03)	(0.03)	(0.03)	(0.03)
Country Fixed Effect	Yes	Yes	Yes	Yes
Quarter Fixed Effect	Yes	No	Yes	No
Time Fixed Effect	No	Yes	No	Yes
R-squared	0.27	0.35	0.24	0.33
Adj. R-squared	0.26	0.32	0.23	0.30
Observations	3,158	3,158	3,173	3,173

Note: This table shows the estimation results from panel regressions where the dependent variable is capital inflows scaled by annualized trend GDP. CF_{t-1} denotes the lagged dependent variable; *GDP growth* refers to the one-year-ahead real GDP growth forecast; *Inflation* is the one-year-ahead inflation forecast; and *CA Balance* is the one-year-ahead forecast of the current account balance-to-GDP ratio. Standard errors, shown in parentheses, are double-clustered by country and year. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 2. Capital inflows, domestic factors, and global factors

(a) Actual capital inflows

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
GDP growth	0.10^{***}					0.10^{***}	0.09^{***}
	(3.68)					(3.27)	(3.48)
Inflation		-0.00				0.02	0.02^{*}
		(-0.41)				(1.69)	(2.01)
Government debt to GDP			-0.03^{***}			-0.02^{***}	-0.03^{***}
			(-3.36)			(-3.84)	(-4.35)
Financial Development				0.33^{**}		0.36^{***}	0.20^{*}
				(2.28)		(2.87)	(2.05)
Capital Account Openness					0.02	-0.00	0.00
					(0.90)	(-0.16)	(0.24)
Country Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time Fixed Effect	No	No	No	No	No	No	Yes
R-squared	0.16	0.11	0.15	0.12	0.11	0.19	0.30
Adj. R-squared	0.15	0.10	0.14	0.12	0.11	0.18	0.25
Observations	3,230	3,164	2,649	3,302	3,302	2,580	2,580

(b) Capital inflow shocks

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
GDP growth	0.00					0.00	0.01
	(0.15)					(0.07)	(0.35)
Inflation		0.00				0.00	0.01^{**}
		(0.48)				(1.30)	(2.49)
Government debt to GDP			-0.00			-0.00	-0.00^{*}
			(-0.26)			(-0.34)	(-1.81)
Financial Development				0.10		0.14^{*}	0.07
				(1.56)		(1.98)	(1.13)
Capital Account Openness					0.00	-0.00	0.02
					(0.14)	(-0.02)	(1.25)
Country Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time Fixed Effect	No	No	No	No	No	No	Yes
R-squared	0.00	0.00	0.00	0.00	0.00	0.00	0.13
Adj. R-squared	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	0.07
Observations	3,135	3,042	2,567	3,158	3,158	2,536	2,536

Note: Panel (a) of the table shows that gross capital inflows are correlated with domestic factors, whereas Panel (b) shows that our measure of capital inflow shocks is not correlated with domestic factors. The dependent variable in Panel (a) is gross capital inflows scaled by annualized trend GDP, while the dependent variable in Panel (b) is the estimated capital inflow shocks. Domestic factors include GDP growth and inflation (both year-over-year), government debt (from the IMF Global Debt Database, using public debt or, if unavailable, central government debt), financial development, and capital account openness. Financial development is measured using the IMF's Financial Development Index (0-1 scale), and capital account openness is captured by the standardized Chinn-Ito Index (0-1). Both indices are scaled by a factor 100 and used in first differences. Global factors are controlled for using year fixed effects in column (7). T-statistics, shown in parentheses, are computed using standard errors double-clustered by country and year. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 3. Domestic factors and future capital inflows

(a) Domestic factors and future actual capital inflows

	(1) t+1	(2) t+2	(3) t+3	(4) t+4	(5) t+5	(6) t+6	(7) t+7
GDP growth	0.08***	0.09***	0.09***	0.10***	0.10***	0.10***	0.08***
	(2.88)	(3.23)	(3.18)	(3.69)	(3.69)	(3.43)	(3.10)
Inflation	0.02**	0.02**	0.02**	0.02**	0.01**	0.01**	0.01*
	(2.07)	(2.33)	(2.33)	(2.40)	(2.34)	(2.16)	(1.98)
Government debt to GDP	-0.03***	-0.03***	-0.02***	-0.02***	-0.02***	-0.02***	-0.02***
	(-4.40)	(-4.55)	(-4.53)	(-4.42)	(-4.45)	(-4.40)	(-4.31)
Financial Development	0.23**	0.27***	0.23**	0.15**	0.16**	0.13**	0.15***
	(2.36)	(2.83)	(2.68)	(2.09)	(2.37)	(2.22)	(3.16)
Capital Account Openness	-0.00	0.02	0.03	0.03	0.03*	0.01	0.02
	(-0.12)	(0.83)	(1.14)	(1.55)	(1.88)	(0.85)	(1.14)
Country Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.30	0.30	0.30	0.30	0.30	0.29	0.28
Adj. R-squared	0.25	0.26	0.26	0.25	0.25	0.24	0.24
Observations	2,583	2,586	2,589	2,592	2,574	2,555	2,536

(b) Domestic factors and future capital inflow shocks

	(1) t+1	(2) t+2	(3) t+3	(4) t+4	(5) t+5	(6) t+6	(7) t+7
GDP growth	-0.02	-0.00	0.01	0.02	0.02**	0.03***	0.02*
	(-1.36)	(-0.26)	(0.92)	(1.49)	(2.25)	(2.84)	(1.76)
Inflation	0.01*	0.01**	0.01*	0.01**	0.01**	0.01*	0.01*
	(1.87)	(2.10)	(1.93)	(2.08)	(2.18)	(1.99)	(1.81)
Government debt to GDP	-0.00**	-0.01**	-0.01**	-0.01**	-0.01***	-0.01***	-0.01**
	(-2.24)	(-2.69)	(-2.65)	(-2.70)	(-2.87)	(-2.81)	(-2.73)
Financial Development	0.08	0.09	0.04	-0.03	0.01	0.01	0.06
	(1.25)	(1.54)	(0.79)	(-0.56)	(0.16)	(0.13)	(1.48)
Capital Account Openness	0.00	0.02	0.01	0.01	0.01	-0.01	0.00
	(0.26)	(1.40)	(0.92)	(0.61)	(0.66)	(-0.95)	(0.25)
Country Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.13	0.13	0.12	0.12	0.13	0.13	0.13
Adj. R-squared	0.07	0.07	0.07	0.07	0.07	0.07	0.07
Observations	2,543	2,550	2,557	2,564	2,550	2,535	2,520

Note: Panel (a) shows that current domestic factors are correlated with future capital inflows, whereas Panel (b) shows that this predictive power disappears when using our measure of capital inflow shocks. In Panel (a), the dependent variable is gross capital inflows, and in Panel (b), it is the estimated capital inflow shocks—both scaled by annualized trend GDP in period $t + h$, where $h = 1,2,\ldots,7$. Domestic factors include GDP growth and inflation (both year-over-year), government debt (from the IMF Global Debt Database, using public debt or, if unavailable, central government debt), financial development, and capital account openness. Financial development is measured using the IMF's Financial Development Index (0-1 scale), and capital account openness is captured by the standardized Chinn-Ito Index (0-1). Both indices are scaled by a factor 100 and used in first differences. T-statistics, shown in parentheses, are computed using standard errors double-clustered by country and year. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 4. Capital inflows and economic forecast by flow type

	FDI		P. Equity		P. Debt		Other	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
CF_{t-1}	0.05***	0.05***	-0.01	-0.00	-0.01	-0.02	0.16***	0.14***
	(3.12)	(3.59)	(-0.75)	(-0.34)	(-0.91)	(-1.24)	(7.25)	(6.92)
GDP Growth	0.06***	0.06***	0.02***	0.01*	-0.02	-0.02	0.17***	0.17***
	(4.18)	(4.46)	(3.62)	(1.91)	(-0.88)	(-1.16)	(4.45)	(3.89)
Inflation	0.00	0.00	0.00**	0.00	-0.00***	-0.00***	0.01***	0.01**
	(0.46)	(1.44)	(2.29)	(0.74)	(-3.54)	(-3.99)	(4.01)	(2.35)
CA Balance	-0.02*	-0.02**	-0.00	-0.00	-0.02	-0.02**	-0.08***	-0.10***
	(-1.87)	(-2.32)	(-1.61)	(-0.19)	(-1.69)	(-2.38)	(-3.51)	(-3.91)
Country Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time Fixed Effect	No	Yes	No	Yes	No	Yes	No	Yes
R-squared	0.24	0.29	0.04	0.12	0.04	0.12	0.19	0.25
Adj. R-squared	0.23	0.25	0.03	0.08	0.03	0.07	0.18	0.21
Observations	3,158	3,158	3,146	3,146	3,119	3,119	3,158	3,158

Note: This table shows the estimation results from panel regressions. The dependent variables are FDI inflows in columns (1)-(2), portfolio equity inflows in columns (3)-(4), portfolio debt inflows in columns (5)-(6), and other investment inflows in columns (7)-(8). They are all scaled by annualized trend GDP. CF_{t-1} denotes the lagged dependent variable; *GDP Growth* refers to the one-year-ahead GDP growth forecast; *Inflation* is the one-year-ahead inflation forecast; and *CA Balance* is the one-year-ahead forecast of the current account balance-to-GDP ratio. t-statistics, shown in parentheses, are computed using standard errors double-clustered by country and year. *, **, *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 5. The nonlinear effect of capital inflows on output

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	h=0	h=1	h=2	h=3	h=4	h=5	h=6	h=7	h=8
G_1 (≤ -1 s.d.)	-0.05	-0.27	-0.54**	-0.67**	-0.58*	-0.47	-0.68	-0.75	-0.82
	(-0.44)	(-1.46)	(-2.43)	(-2.48)	(-1.90)	(-1.08)	(-1.53)	(-1.69)	(-1.59)
G_2 (≤ -0.25 s.d.)	0.04	0.07	-0.08	-0.20	-0.30	-0.31	-0.25	-0.28	-0.35
	(0.43)	(0.65)	(-0.57)	(-1.17)	(-1.43)	(-1.28)	(-0.92)	(-1.01)	(-1.09)
G_4 (≥ 0.25 s.d.)	0.10	0.18	0.20	0.10	0.20	0.15	0.00	0.08	0.03
	(1.42)	(1.34)	(1.34)	(0.50)	(0.83)	(0.55)	(0.01)	(0.27)	(0.10)
G_5 (≥ 1 s.d.)	0.22*	0.34**	0.35	0.38	0.37	0.27	0.10	0.02	0.15
	(1.86)	(2.19)	(1.66)	(1.63)	(1.52)	(0.88)	(0.32)	(0.07)	(0.39)
Adj. R-squared	0.53	0.53	0.53	0.52	0.52	0.51	0.50	0.49	0.49
Observations	2,891	2,864	2,837	2,810	2,783	2,756	2,729	2,702	2,675

Note: This table shows the nonlinear effect of capital inflows on real GDP. The capital inflow shocks are divided into five bins based on standard deviations (s.d.) specific to each country: less than -1 s.d. (G_1), -1 s.d. to -0.25 s.d. (G_2), -0.25 s.d. to 0.25 s.d. (G_3), 0.25 s.d. to 1 s.d. (G_4), and greater than 1 s.d. (G_5). The omitted bin is capital inflow shocks between -0.25 and 0.25 s.d. (G_3). T-statistics, shown in parentheses, are computed using standard errors double-clustered by country and year. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Expectations-based Capital Inflow Shocks

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Supplemental On-Line Appendix
(not for publication)

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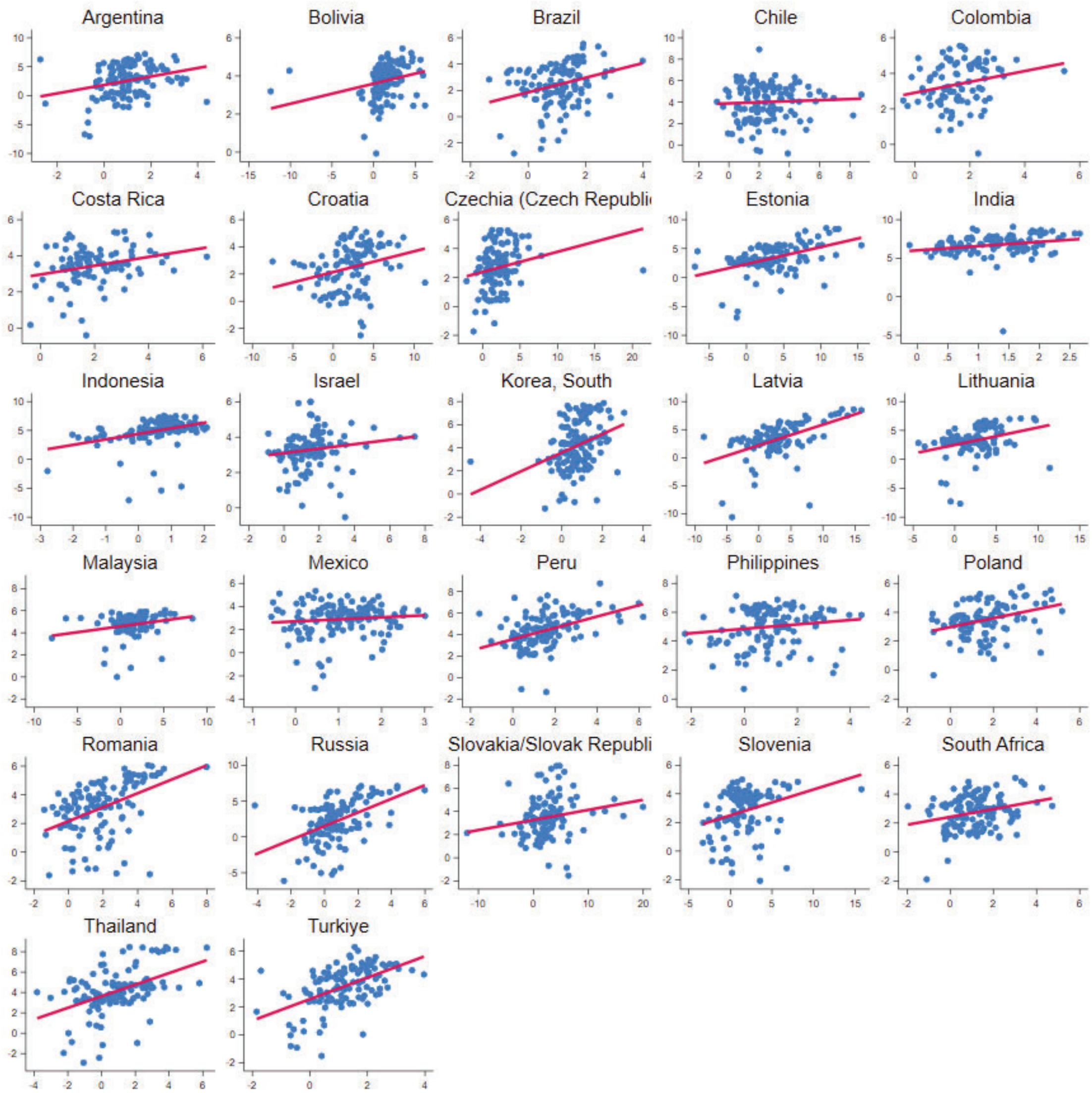
Appendix

A. Additional Figures and Tables

Figure A1. The relationship between GDP forecasts and capital inflows

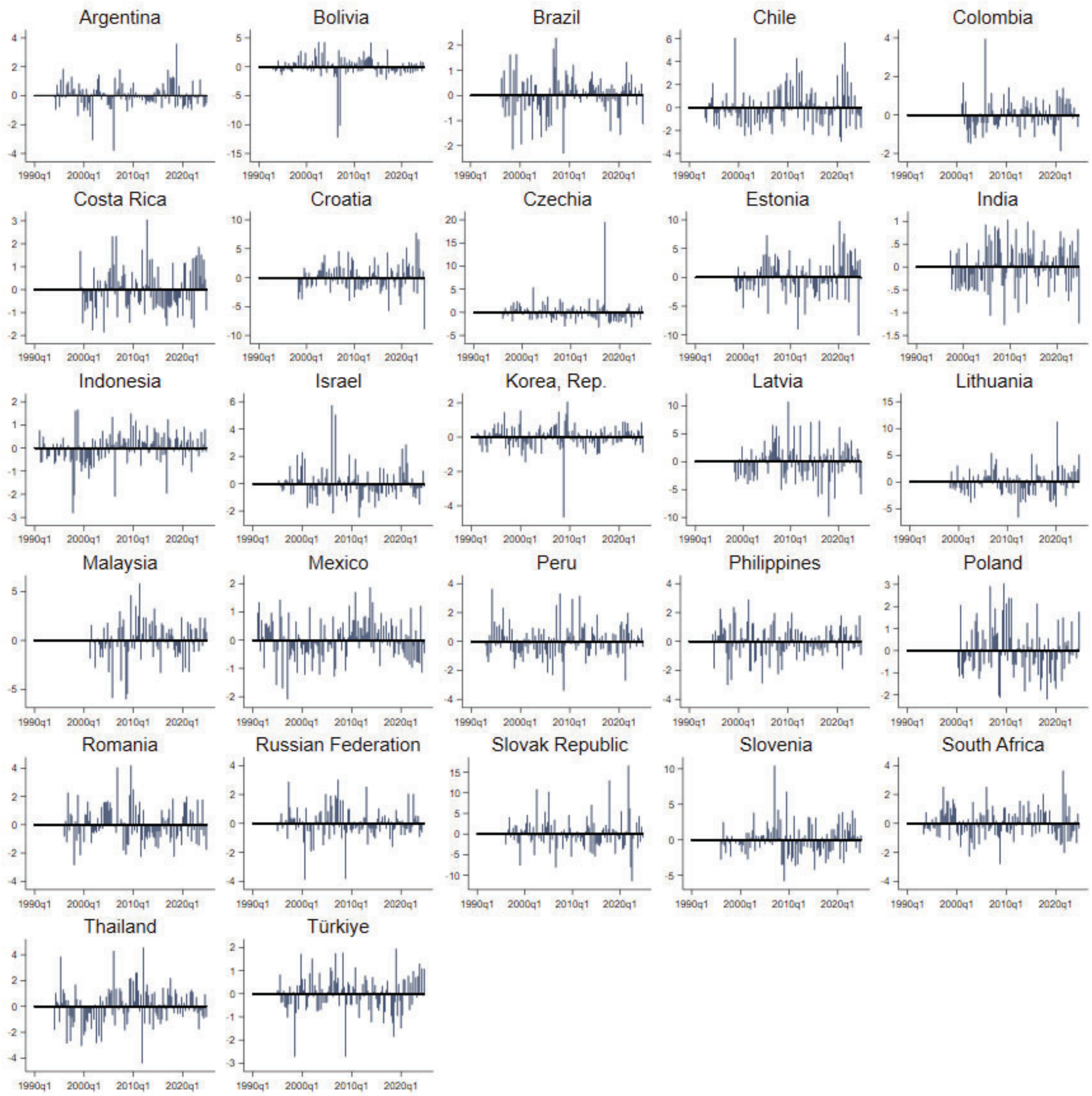
Note: This figure plots the one-year-ahead real GDP growth forecast against capital inflows scaled by annualized trend GDP. Each dot represents a country-quarter observation. The red line shows the fitted linear relationship.

Figure A2. The relationship between GDP forecasts and capital inflows by country



Note: This figure plots the one-year-ahead real GDP growth forecast (y-axis) against capital inflows scaled by annualized trend GDP (x-axis). Each dot represents a country-quarter observation. The red line shows the fitted linear relationship.

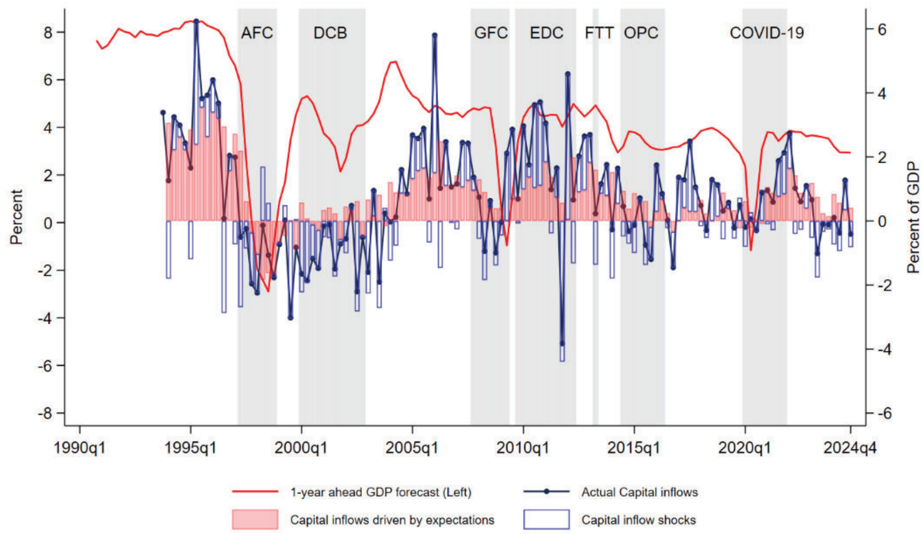
Figure A3. Estimated capital inflow shocks by country



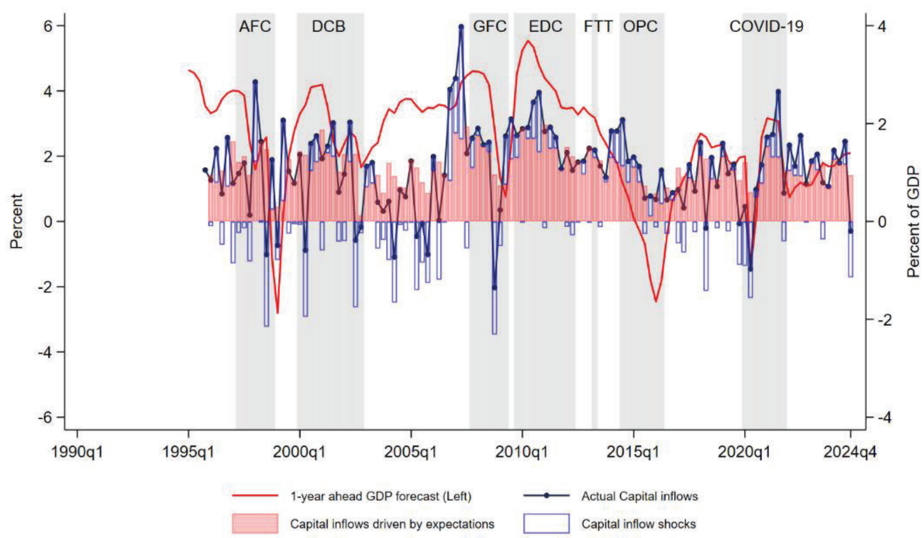
Note: This figure shows the estimated capital inflow shocks for each country over time. Shocks are computed as the residuals from country-specific regressions of capital inflows on economic forecasts. Values are scaled by annualized trend GDP.

Figure A4. Decomposition of capital inflows

(a) Thailand



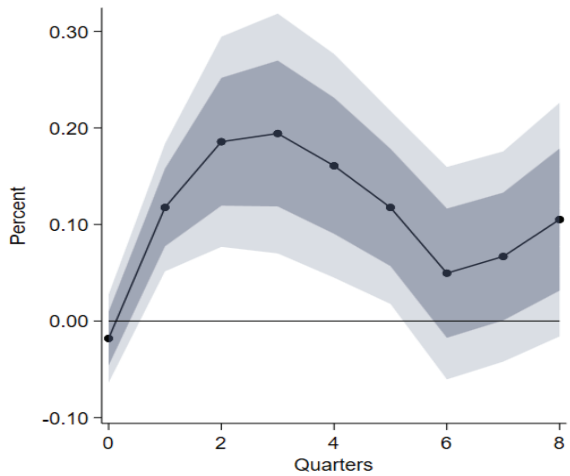
(b) Brazil



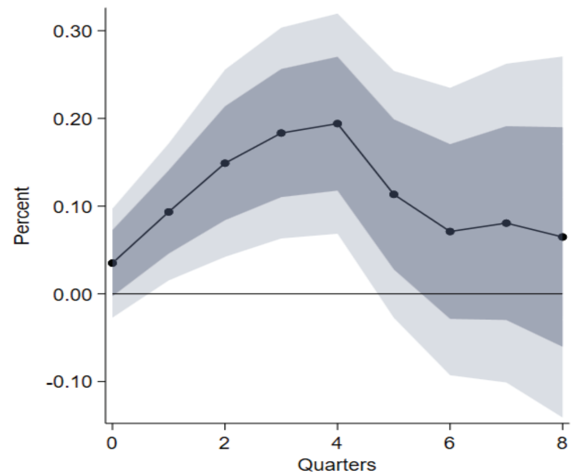
Note: This figure shows the decomposition of capital inflows into endogenous and exogenous components for Thailand and Brazil, respectively. The red line represents the one-year-ahead real GDP growth forecast (left axis). The black line with dots shows actual capital inflows as a percent of annualized trend GDP (right axis). The red shaded area represents the component driven by expectations, calculated as the fitted values from the first-stage regression. The blue bars represent capital inflow shocks, calculated as the residual from the same regression. Shaded regions indicate major global or regional events: AFC (Asian Financial Crisis); DCB (Dot-com Bubble); GFC (Global Financial Crisis); EDC (European Debt Crisis); FTT (Taper Tantrum); OPC (Oil Price Collapse); and Covid-19.

Figure A5. Output responses to capital inflows: alternative controls

(a) Controlling for global factors directly



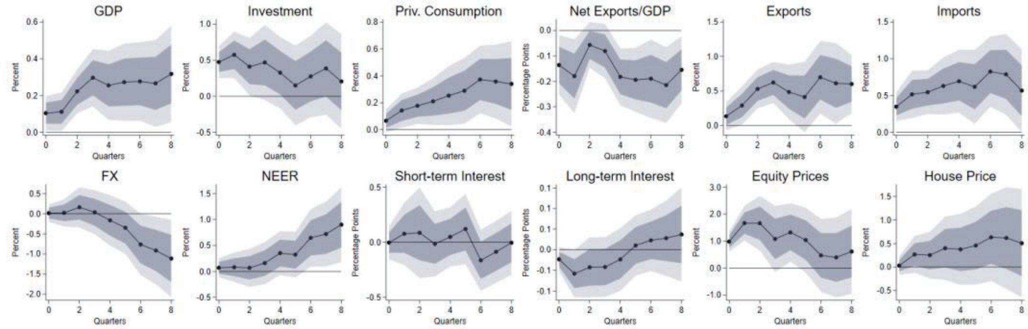
(b) Controlling for sovereign spreads



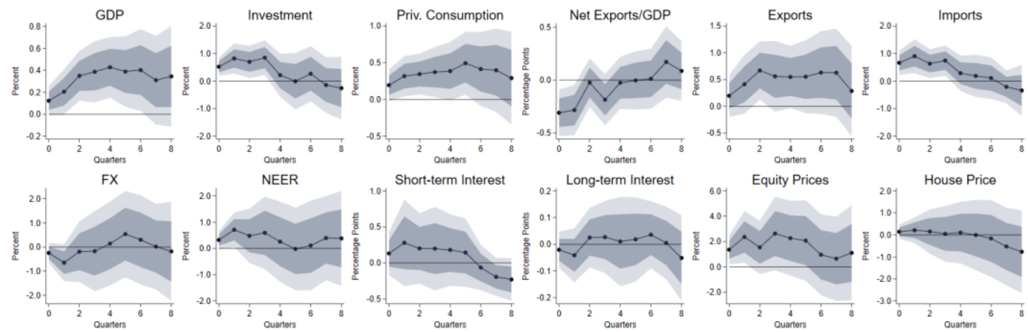
Note: This figure shows the cumulative response of real GDP to a one-percentage-point increase in the ratio of capital inflows to annualized trend GDP over an 8-quarter horizon. Panel (a) replaces time fixed effects with observable global factors: U.S. monetary policy shocks from Bauer and Swanson (2023), the VIX, and commodity price changes. Panel (b) adds sovereign spreads, measured by EMBI spreads, to the baseline specification. Shaded areas are 68% and 90% confidence intervals computed from standard errors double-clustered on country and time.

Figure A6. Impulse responses to capital inflow shocks by type

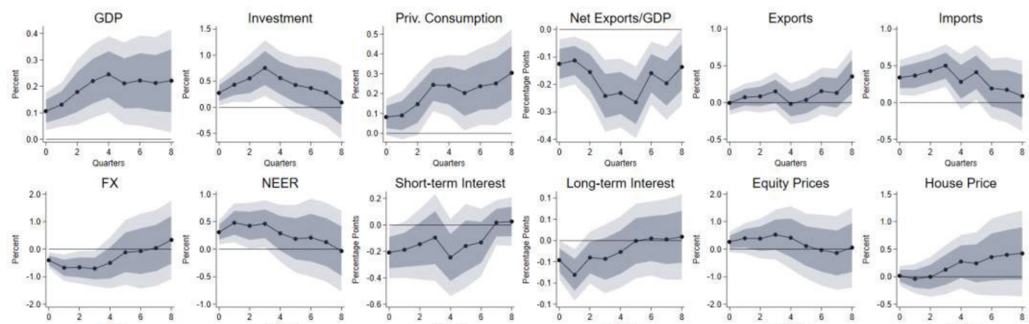
(a) FDI Inflows



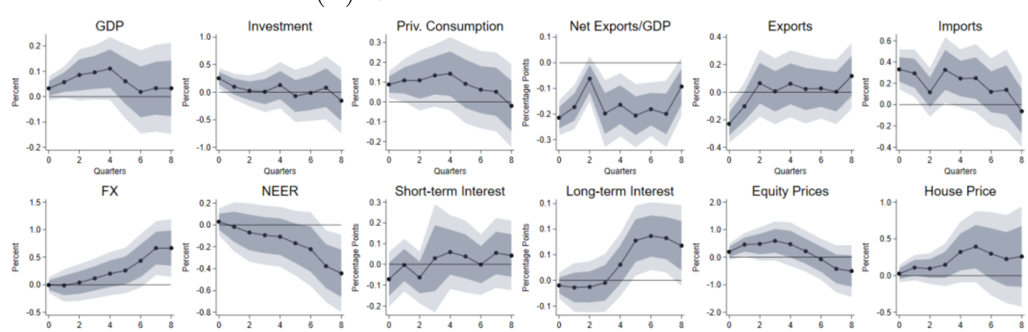
(b) Portfolio equity inflows



(c) Portfolio debt inflows



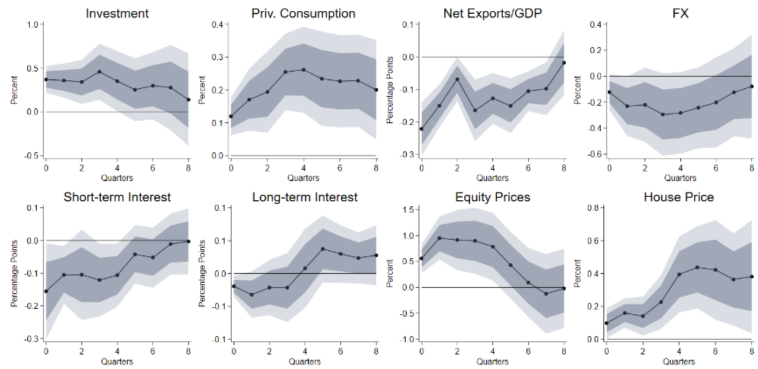
(d) Other investment inflows



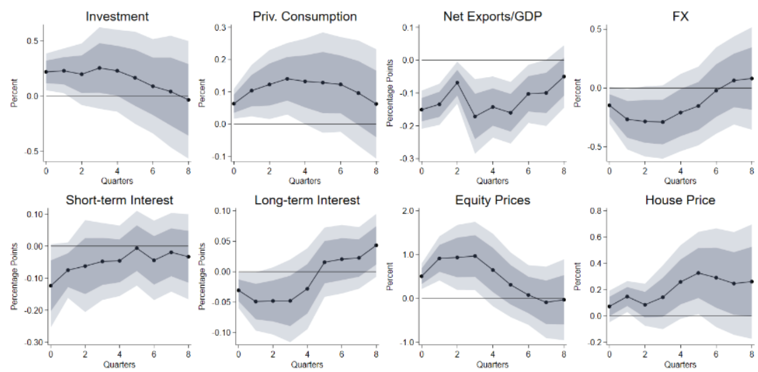
Note: This figure shows the cumulative response of real GDP to a one-percentage-point increase in the ratio of each type of capital inflows to annualized trend GDP over an 8-quarter horizon. Shaded areas are 68% and 90% confidence intervals computed from standard errors double-clustered on country and time.

Figure A7. Robustness

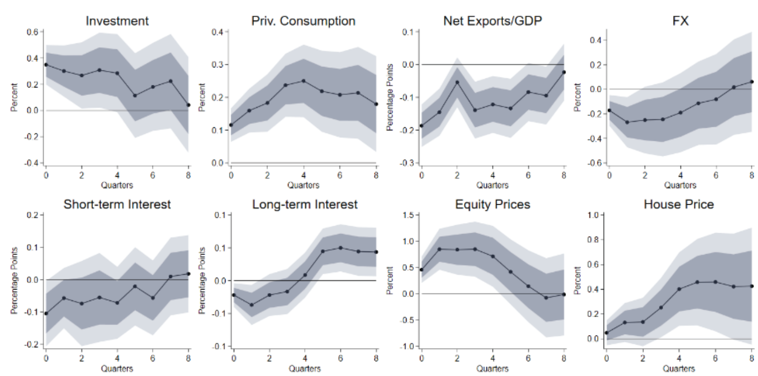
(a) Robustness 1: Net capital inflow shocks



(b) Robustness 2: Excluding the post-pandemic period

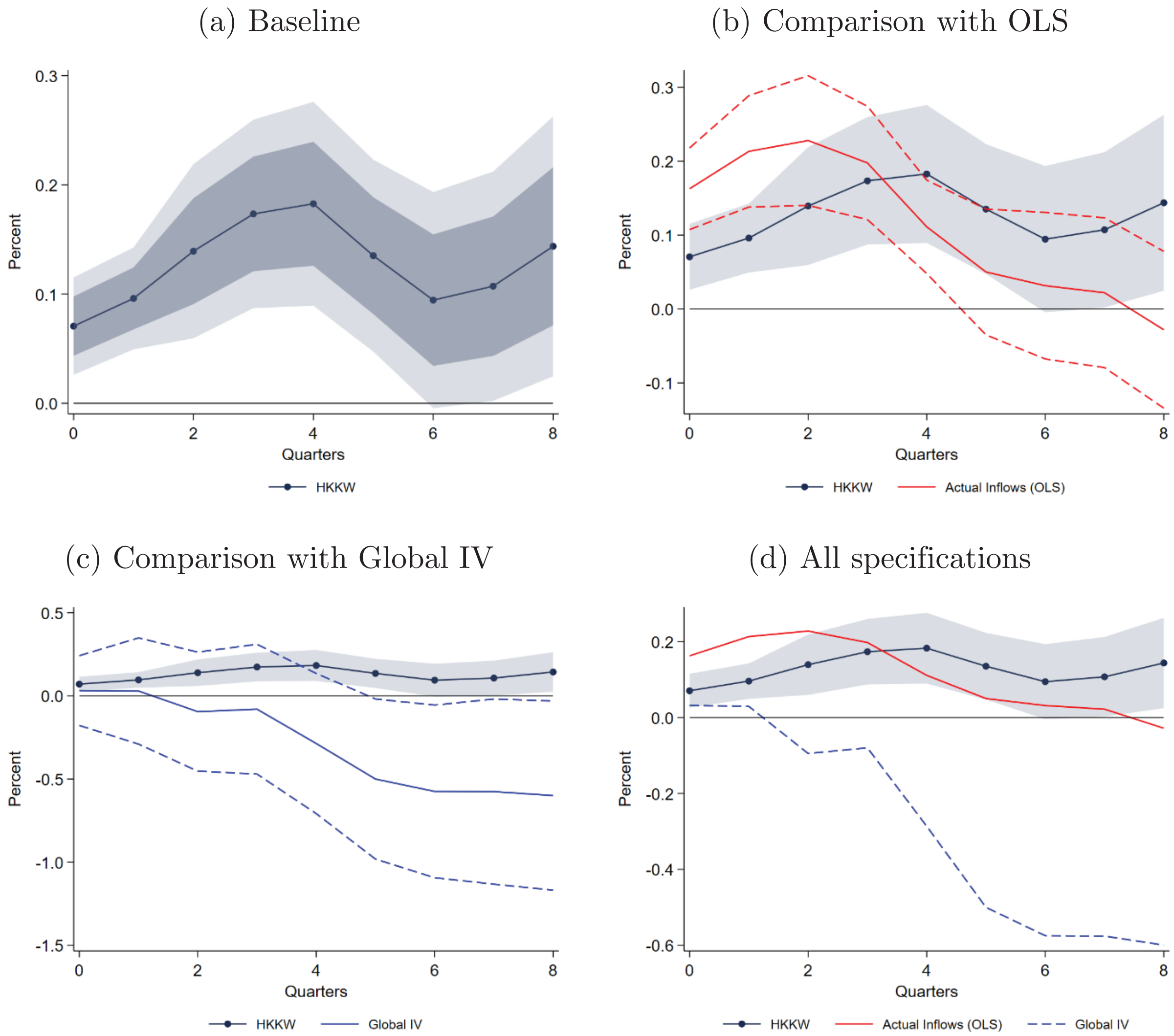


(c) Robustness 3: LP-IV



Note: Panel (a) shows the cumulative response to a one-percentage-point increase in the ratio of *net* capital inflows to annualized trend GDP. Panels (b) and (c) show the cumulative response to a one-percentage-point increase in the ratio of capital inflows to annualized trend GDP. In Panel (c), our measure of capital inflow shocks is used as external instrument. Shaded areas are 68% and 90% confidence intervals computed from standard errors double-clustered on country and time.

Figure A8. Output responses to capital inflows using corrected local projections



Note: This figure shows the cumulative response of real GDP to a one-percentage-point increase in the ratio of capital inflows to annualized trend GDP over an 8-quarter horizon, estimated using corrected local projections that include forward shocks within the estimation horizon. “HKKW” denotes our baseline estimates based on capital inflow shocks purged of expectation-driven components. “Actual inflows (OLS)” reports estimates from a regression using actual capital inflows, while “Global IV” uses an instrumental-variable strategy following Blanchard et al. (2017). Shaded areas in panel (a) indicate 68% and 90% confidence intervals. In the remaining panels, shaded areas and dashed lines indicate 90% confidence intervals. Confidence intervals are computed using standard errors double-clustered by country and time.

Table A1. Capital inflows and economic forecasts

	CF_{t-1}		GDP Growth		Inflation		CA Balance			
	Coef.	(S.E.)	Coef.	(S.E.)	Coef.	(S.E.)	Coef.	(S.E.)	N	R^2
ARG	0.18^{*}	(0.10)	0.12^{***}	(0.04)	0.00	(0.00)	-0.20^{***}	(0.05)	124	0.36
BOL	0.23^{**}	(0.09)	0.45^{**}	(0.23)	0.09	(0.09)	-0.07^{*}	(0.03)	127	0.24
BRA	0.18^{*}	(0.10)	0.13^{***}	(0.05)	-0.06	(0.04)	-0.07	(0.06)	116	0.20
CHL	0.17^{*}	(0.09)	0.17^{*}	(0.10)	-0.14^{*}	(0.08)	-0.14	(0.09)	128	0.10
COL	0.02	(0.11)	0.21^{**}	(0.08)	-0.07	(0.07)	-0.23^{**}	(0.09)	96	0.24
CRI	-0.07	(0.10)	0.37^{***}	(0.11)	-0.04	(0.04)	-0.36^{***}	(0.10)	103	0.29
CZE	0.06	(0.10)	0.36^{**}	(0.15)	-0.02	(0.10)	0.04	(0.12)	116	0.08
EST	0.25^{**}	(0.10)	0.36^{**}	(0.16)	-0.01	(0.16)	-0.16^{**}	(0.08)	107	0.35
HRV	-0.07	(0.11)	0.37^{**}	(0.16)	0.23	(0.20)	-0.26^{***}	(0.09)	107	0.33
IDN	0.42^{***}	(0.09)	0.10^{**}	(0.05)	0.03	(0.02)	-0.08^{**}	(0.04)	136	0.40
IND	0.45^{***}	(0.09)	0.04	(0.04)	-0.04	(0.04)	-0.12^{**}	(0.06)	111	0.33
ISR	0.30^{***}	(0.09)	0.09	(0.12)	-0.00	(0.07)	-0.01	(0.06)	120	0.15
KOR	0.34^{***}	(0.09)	0.08^{*}	(0.05)	-0.05	(0.05)	-0.05	(0.04)	136	0.34
LTU	0.09	(0.11)	0.24^{**}	(0.12)	0.13	(0.14)	-0.09	(0.07)	107	0.18
LVA	0.11	(0.11)	0.40^{***}	(0.12)	-0.10	(0.20)	-0.30^{***}	(0.10)	107	0.43
MEX	0.22^{**}	(0.09)	0.04	(0.05)	-0.00	(0.01)	-0.05	(0.05)	136	0.20
MYS	0.24^{**}	(0.11)	0.55^{**}	(0.25)	-1.02^{***}	(0.38)	0.04	(0.05)	95	0.25
PER	0.12	(0.09)	0.36^{***}	(0.08)	0.03^{**}	(0.01)	0.01	(0.05)	128	0.27
PHL	0.22^{**}	(0.10)	0.10	(0.10)	0.06	(0.08)	-0.13^{***}	(0.05)	121	0.24
POL	0.36^{***}	(0.11)	0.25^{**}	(0.11)	0.06	(0.05)	0.00	(0.06)	99	0.29
ROU	0.01	(0.10)	0.29^{***}	(0.08)	0.01	(0.01)	-0.27^{***}	(0.05)	116	0.46
RUS	0.34^{***}	(0.09)	0.26^{***}	(0.06)	0.01^{**}	(0.00)	-0.13^{**}	(0.05)	119	0.48
SVK	0.10	(0.10)	0.36	(0.22)	-0.21	(0.17)	-0.13	(0.17)	116	0.09
SVN	0.25^{**}	(0.10)	0.47^{***}	(0.17)	-0.22^{*}	(0.12)	-0.17^{**}	(0.08)	116	0.28
THA	0.26^{***}	(0.09)	0.16^{*}	(0.09)	-0.06	(0.09)	-0.09^{*}	(0.05)	124	0.33
TUR	-0.00	(0.11)	0.29^{***}	(0.06)	-0.00	(0.00)	-0.17^{***}	(0.06)	120	0.42
ZAF	0.17^{*}	(0.09)	0.25^{***}	(0.09)	-0.06	(0.06)	-0.06	(0.05)	127	0.21

Note: This table reports the estimation results of equation (3) for each country, where the dependent variable is capital inflows scaled by annualized trend GDP. CF_{t-1} denotes the lagged dependent variable; *GDP growth* refers to the one-year-ahead real GDP growth forecast; *Inflation* is the one-year-ahead inflation forecast; and *CA Balance* is the one-year-ahead forecast of the current account balance-to-GDP ratio. *N* indicates the number of observations. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Table A2. Capital inflows, risk premia, and financing conditions

	Actual capital inflows				Inflow residuals (our measure)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Sovereign spreads	-0.04***			-0.04**	-0.01			-0.01
	(0.01)			(0.01)	(0.01)			(0.01)
Exchange rate expectations		0.01		0.00		-0.00		-0.01
		(0.01)		(0.02)		(0.00)		(0.01)
Interest rate differentials			-0.00	0.00			0.00	-0.00
			(0.00)	(0.01)			(0.00)	(0.00)
Within R-squared	0.02	0.00	0.00	0.03	0.00	0.00	0.00	0.00
Observations	1,884	2,288	2,434	1,539	1,868	2,277	2,363	1,535
Countries	23	20	22	18	23	20	22	18

Note: This table reports results from panel regressions with country fixed effects. The dependent variable is actual capital inflows scaled by annualized trend GDP in columns (1)-(4) and our measure of capital inflow shocks in columns (5)-(8). Sovereign spreads are quarterly averages of J.P. Morgan's Emerging Markets Bond Index (EMBI) spreads. Exchange rate expectations are one-year-ahead forecasts from Consensus Economics, with positive values indicating expected currency appreciation. Interest rate differentials are domestic policy rates minus the U.S. federal funds rate, with shadow rates used during zero lower bound periods. Standard errors, shown in parentheses, are clustered by country. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Table A3. Capital inflow shocks and subsequent growth forecast revisions

(a) Current year GDP growth forecast revisions

	(1) 1Q ahead	(2) 2Q ahead	(3) 3Q ahead	(4) 4Q ahead	(5) 1Q ahead	(6) 2Q ahead	(7) 3Q ahead	(8) 4Q ahead
Capital inflow shocks	0.09**	0.23***	0.29***	0.26***	0.02	0.04	0.07*	0.06
	(0.02)	(0.05)	(0.05)	(0.05)	(0.02)	(0.03)	(0.03)	(0.03)
Global growth forecast revision					1.03***	0.95***	0.90***	0.92***
					(0.11)	(0.11)	(0.11)	(0.11)
Realized growth					0.15***	0.28***	0.32***	0.30***
					(0.03)	(0.04)	(0.04)	(0.04)
Change in VIX					0.00	-0.03**	-0.06***	-0.08***
					(0.01)	(0.01)	(0.01)	(0.02)
Within R-squared	0.01	0.03	0.03	0.02	0.39	0.48	0.54	0.54
Observations	2,593	2,566	2,539	2,512	2,582	2,555	2,528	2,501
Countries	27	27	27	27	27	27	27	27

(b) Next year GDP growth forecast revisions

	(1) 1Q ahead	(2) 2Q ahead	(3) 3Q ahead	(4) 4Q ahead	(5) 1Q ahead	(6) 2Q ahead	(7) 3Q ahead	(8) 4Q ahead
Capital inflow shocks	0.04***	0.06***	0.07***	0.04**	0.01*	0.02	0.02	0.00
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Global growth forecast revision					0.94***	0.94***	0.93***	0.92***
					(0.05)	(0.06)	(0.08)	(0.10)
Realized growth					0.04**	0.07***	0.08***	0.08***
					(0.01)	(0.01)	(0.01)	(0.01)
Change in VIX					-0.02***	-0.03***	-0.04***	-0.05***
					(0.00)	(0.01)	(0.01)	(0.01)
Within R-squared	0.01	0.01	0.01	0.00	0.35	0.39	0.42	0.43
Observations	2593	2566	2539	2512	2582	2555	2528	2501
Countries	27	27	27	27	27	27	27	27

Note: This table reports panel regressions of cumulative revisions to current-year GDP growth forecasts in Panel (a) and next-year GDP growth forecasts in Panel (b) on our measure of capital inflow shocks. Forecast revisions are calculated over horizons of one to four quarters using forecasts from Consensus Economics. Columns (1)-(4) report baseline specifications. Columns (5)-(8) additionally control for global growth forecast revisions and changes in the VIX over the corresponding horizon, as well as cumulative realized domestic GDP growth over the same horizon, lagged by one quarter. All specifications include country fixed effects. Standard errors clustered by country are shown in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Table A4. FDI inflows and economic forecasts

	CF_{t-1}		GDP Growth		Inflation		CA Balance			
	Coef.	(S.E.)	Coef.	(S.E.)	Coef.	(S.E.)	Coef.	(S.E.)	N	R^2
ARG	0.25^{***}	(0.09)	0.02	(0.02)	0.00	(0.00)	-0.03^{*}	(0.02)	124	0.13
BOL	0.62^{***}	(0.07)	0.19^{**}	(0.09)	0.03	(0.04)	-0.02	(0.01)	127	0.52
BRA	0.19^{**}	(0.09)	-0.00	(0.02)	-0.03^{*}	(0.01)	-0.06^{***}	(0.02)	116	0.23
CHL	0.08	(0.09)	0.11	(0.07)	-0.11^{**}	(0.05)	-0.10^{*}	(0.06)	128	0.10
COL	0.10	(0.10)	0.10^{**}	(0.05)	0.01	(0.04)	-0.06	(0.05)	96	0.11
CRI	0.05	(0.10)	0.19^{***}	(0.05)	0.01	(0.02)	-0.11^{***}	(0.04)	103	0.34
CZE	0.17^{*}	(0.09)	0.06	(0.06)	-0.02	(0.04)	-0.04	(0.05)	116	0.08
EST	0.26^{***}	(0.10)	0.08	(0.11)	0.02	(0.12)	-0.04	(0.06)	107	0.13
HRV	0.01	(0.10)	0.11^{*}	(0.06)	0.02	(0.07)	-0.04	(0.03)	107	0.10
IDN	0.54^{***}	(0.08)	0.03^{*}	(0.02)	0.01	(0.01)	-0.03^{**}	(0.01)	136	0.54
IND	0.55^{***}	(0.08)	0.03^{***}	(0.01)	-0.01	(0.01)	-0.02	(0.02)	111	0.44
ISR	0.21^{**}	(0.09)	0.09	(0.06)	-0.07^{**}	(0.03)	0.01	(0.03)	120	0.19
KOR	0.48^{***}	(0.08)	0.00	(0.01)	-0.00	(0.01)	0.00	(0.01)	136	0.32
LTU	-0.08	(0.10)	0.09^{*}	(0.05)	0.09	(0.06)	-0.01	(0.03)	107	0.09
LVA	0.08	(0.10)	0.11^{***}	(0.03)	0.08	(0.05)	-0.01	(0.02)	107	0.32
MEX	-0.04	(0.09)	0.01	(0.02)	-0.01^{**}	(0.00)	0.02	(0.02)	136	0.23
MYS	-0.02	(0.11)	0.17^{***}	(0.05)	0.12	(0.09)	0.01	(0.01)	103	0.21
PER	0.06	(0.09)	0.16^{***}	(0.04)	0.01	(0.01)	-0.01	(0.03)	128	0.16
PHL	0.20^{**}	(0.09)	0.03	(0.02)	-0.00	(0.02)	-0.01	(0.01)	121	0.09
POL	-0.13	(0.10)	0.25^{***}	(0.05)	0.08^{***}	(0.02)	0.05^{*}	(0.03)	99	0.40
ROU	0.21^{**}	(0.10)	0.09^{***}	(0.03)	0.00	(0.00)	-0.08^{***}	(0.02)	116	0.40
RUS	0.20^{**}	(0.09)	0.09^{***}	(0.02)	0.00	(0.00)	-0.04^{**}	(0.02)	119	0.38
SVK	0.16^{*}	(0.09)	0.19^{**}	(0.08)	0.01	(0.06)	-0.07	(0.06)	116	0.14
SVN	0.23^{**}	(0.09)	0.11^{***}	(0.04)	-0.02	(0.03)	0.03^{*}	(0.02)	116	0.23
THA	0.14	(0.09)	0.00	(0.03)	0.09^{***}	(0.03)	0.03^{*}	(0.02)	124	0.12
TUR	0.37^{***}	(0.09)	0.00	(0.01)	-0.00	(0.00)	-0.03^{**}	(0.01)	120	0.44
ZAF	-0.03	(0.09)	0.10	(0.08)	-0.09^{*}	(0.05)	0.06	(0.05)	127	0.07

Note: This table reports the estimation results of equation (3) for each country, where the dependent variable is FDI inflows scaled by annualized trend GDP. CF_{t-1} denotes the lagged dependent variable; *GDP growth* refers to the one-year-ahead real GDP growth forecast; *Inflation* is the one-year-ahead inflation forecast; and *CA Balance* is the one-year-ahead forecast of the current account balance-to-GDP ratio. *N* indicates the number of observations. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Table A5. Portfolio equity inflows and economic forecasts

	CF_{t-1}		GDP Growth		Inflation		CA Balance			
	Coef.	(S.E.)	Coef.	(S.E.)	Coef.	(S.E.)	Coef.	(S.E.)	N	R^2
ARG	0.05	(0.09)	0.02*	(0.01)	0.00	(0.00)	0.01	(0.01)	124	0.07
BOL	0.25***	(0.09)	0.00	(0.00)	-0.00	(0.00)	-0.00	(0.00)	127	0.12
BRA	0.16	(0.11)	0.03**	(0.02)	0.01	(0.01)	0.02	(0.02)	116	0.13
CHL	0.24***	(0.09)	0.02	(0.02)	0.02	(0.01)	-0.03*	(0.02)	128	0.17
COL	0.51***	(0.09)	0.01	(0.01)	-0.01	(0.01)	0.01	(0.01)	96	0.37
CRI	-0.01	(0.10)	-0.00	(0.00)	-0.00***	(0.00)	0.01***	(0.00)	103	0.29
CZE	0.10	(0.09)	-0.01	(0.01)	0.02**	(0.01)	-0.00	(0.01)	116	0.11
EST	0.29***	(0.10)	0.01	(0.05)	0.02	(0.05)	0.00	(0.02)	107	0.09
HRV	-0.17*	(0.10)	0.02***	(0.01)	-0.02	(0.01)	-0.01**	(0.00)	107	0.14
IDN	0.32***	(0.10)	0.05**	(0.02)	0.01	(0.01)	0.02*	(0.01)	136	0.22
IND	0.39***	(0.09)	-0.00	(0.02)	0.01	(0.02)	0.03	(0.03)	111	0.18
ISR	-0.07	(0.09)	0.12**	(0.06)	-0.02	(0.03)	-0.04	(0.03)	120	0.10
KOR	0.43***	(0.08)	0.00	(0.02)	0.02	(0.02)	0.01	(0.02)	136	0.20
LTU	-0.13	(0.10)	-0.00	(0.01)	-0.01	(0.01)	-0.00	(0.00)	107	0.03
LVA	0.09	(0.10)	0.01*	(0.00)	-0.01	(0.00)	0.00	(0.00)	107	0.14
MEX	0.28***	(0.09)	-0.00	(0.01)	0.01**	(0.00)	-0.05***	(0.01)	136	0.28
MYS	0.33***	(0.11)	0.05	(0.08)	-0.12	(0.12)	0.00	(0.02)	91	0.17
PER	0.34***	(0.09)	0.01	(0.01)	0.00***	(0.00)	0.00	(0.00)	128	0.27
PHL	0.43***	(0.09)	-0.00	(0.02)	0.02	(0.01)	0.00	(0.01)	115	0.26
POL	0.22**	(0.10)	-0.00	(0.02)	-0.01	(0.01)	-0.00	(0.01)	99	0.08
ROU	-0.03	(0.10)	0.00	(0.01)	0.00***	(0.00)	-0.00	(0.00)	116	0.09
RUS	-0.04	(0.10)	0.02**	(0.01)	0.00***	(0.00)	0.00	(0.01)	119	0.10
SVK	0.04	(0.10)	0.00	(0.01)	-0.00	(0.01)	-0.01	(0.01)	116	0.06
SVN	-0.03	(0.10)	0.00	(0.01)	-0.01	(0.01)	0.00	(0.01)	111	0.05
THA	0.42***	(0.09)	-0.02	(0.02)	-0.01	(0.03)	-0.02*	(0.01)	124	0.24
TUR	0.11	(0.10)	0.02*	(0.01)	-0.00	(0.00)	0.00	(0.01)	120	0.12
ZAF	0.35***	(0.09)	0.06	(0.07)	0.02	(0.04)	-0.03	(0.04)	127	0.17

Note: This table reports the estimation results of equation (3) for each country, where the dependent variable is portfolio equity inflows scaled by annualized trend GDP. CF_{t-1} denotes the lagged dependent variable; *GDP growth* refers to the one-year-ahead real GDP growth forecast; *Inflation* is the one-year-ahead inflation forecast; and *CA Balance* is the one-year-ahead forecast of the current account balance-to-GDP ratio. *N* indicates the number of observations. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Table A6. Portfolio debt inflows and economic forecasts

	CF_{t-1}		GDP Growth		Inflation		CA Balance			
	Coef.	(S.E.)	Coef.	(S.E.)	Coef.	(S.E.)	Coef.	(S.E.)	N	R^2
ARG	0.54***	(0.08)	0.03	(0.03)	0.00	(0.00)	-0.06**	(0.03)	124	0.46
BOL	-0.00	(0.09)	0.02	(0.03)	-0.01	(0.01)	-0.00	(0.00)	127	0.04
BRA	-0.03	(0.10)	0.09***	(0.02)	-0.02	(0.02)	-0.05*	(0.03)	116	0.18
CHL	0.33***	(0.09)	0.02	(0.04)	-0.07**	(0.03)	-0.03	(0.04)	128	0.16
COL	0.15	(0.11)	0.01	(0.05)	-0.03	(0.04)	-0.07	(0.06)	96	0.10
CRI	-0.07	(0.10)	0.09	(0.07)	-0.03	(0.03)	-0.18***	(0.06)	103	0.14
CZE	0.09	(0.10)	-0.04	(0.07)	-0.08*	(0.05)	-0.02	(0.06)	116	0.08
EST	-0.03	(0.10)	0.02	(0.07)	0.05	(0.07)	0.01	(0.04)	107	0.02
HRV	-0.16*	(0.10)	-0.10	(0.06)	0.02	(0.08)	-0.04	(0.03)	107	0.08
IDN	0.19**	(0.09)	0.01	(0.02)	0.00	(0.01)	-0.04**	(0.02)	136	0.15
IND	0.36***	(0.12)	0.01	(0.01)	0.01	(0.01)	0.01	(0.02)	74	0.16
ISR	0.34***	(0.09)	-0.07	(0.06)	0.02	(0.03)	0.01	(0.03)	120	0.15
KOR	0.42***	(0.08)	-0.01	(0.02)	-0.06**	(0.02)	-0.06***	(0.02)	136	0.33
LTU	-0.17*	(0.10)	-0.17***	(0.06)	-0.13*	(0.07)	-0.06*	(0.04)	107	0.12
LVA	-0.09	(0.10)	0.01	(0.04)	0.06	(0.07)	0.04	(0.03)	107	0.03
MEX	0.49***	(0.08)	0.04	(0.03)	-0.00	(0.01)	0.01	(0.03)	136	0.30
MYS	0.06	(0.11)	0.17	(0.16)	-0.82***	(0.26)	0.07**	(0.04)	91	0.20
PER	0.06	(0.09)	0.04	(0.06)	-0.01	(0.01)	0.02	(0.04)	128	0.07
PHL	0.11	(0.09)	-0.06	(0.05)	0.00	(0.04)	-0.05*	(0.03)	121	0.09
POL	0.24**	(0.10)	-0.02	(0.06)	0.00	(0.03)	-0.03	(0.04)	99	0.09
ROU	0.02	(0.10)	0.02	(0.04)	-0.01	(0.00)	0.04	(0.02)	116	0.05
RUS	0.17*	(0.09)	0.01	(0.03)	-0.00	(0.00)	-0.10**	(0.04)	119	0.14
SVK	-0.02	(0.09)	-0.18***	(0.07)	0.06	(0.05)	0.09*	(0.05)	116	0.20
SVN	-0.07	(0.09)	-0.58***	(0.14)	0.08	(0.10)	-0.09	(0.06)	116	0.25
THA	0.02	(0.09)	0.03	(0.02)	0.02	(0.02)	-0.01	(0.01)	124	0.10
TUR	0.25**	(0.10)	0.03	(0.04)	0.00	(0.00)	-0.04	(0.04)	120	0.15
ZAF	0.15*	(0.09)	0.00	(0.05)	0.01	(0.03)	-0.05	(0.03)	127	0.10

Note: This table reports the estimation results of equation (3) for each country, where the dependent variable is portfolio debt inflows scaled by annualized trend GDP. CF_{t-1} denotes the lagged dependent variable; *GDP growth* refers to the one-year-ahead real GDP growth forecast; *Inflation* is the one-year-ahead inflation forecast; and *CA Balance* is the one-year-ahead forecast of the current account balance-to-GDP ratio. *N* indicates the number of observations. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Table A7. Other investment inflows and economic forecasts

	CF_{t-1}		GDP Growth		Inflation		CA Balance			
	Coef.	(S.E.)	Coef.	(S.E.)	Coef.	(S.E.)	Coef.	(S.E.)	N	R^2
ARG	0.18^{*}	(0.09)	0.01	(0.04)	-0.00	(0.00)	-0.04	(0.04)	124	0.06
BOL	0.19^{**}	(0.09)	0.14	(0.20)	0.05	(0.08)	-0.03	(0.03)	127	0.15
BRA	0.21^{**}	(0.09)	0.04	(0.03)	-0.02	(0.02)	0.01	(0.04)	116	0.15
CHL	0.14	(0.09)	0.04	(0.05)	0.02	(0.03)	0.03	(0.04)	128	0.09
COL	0.11	(0.11)	0.06	(0.05)	-0.03	(0.04)	-0.08	(0.05)	96	0.21
CRI	0.01	(0.11)	0.06	(0.07)	-0.01	(0.03)	-0.05	(0.06)	103	0.21
CZE	-0.10	(0.09)	0.39^{***}	(0.12)	0.09	(0.08)	0.12	(0.10)	116	0.10
EST	0.15	(0.10)	0.28^{**}	(0.12)	-0.09	(0.12)	-0.15^{**}	(0.06)	107	0.31
HRV	0.05	(0.11)	0.28^{**}	(0.14)	0.19	(0.17)	-0.16^{**}	(0.07)	107	0.28
IDN	0.27^{***}	(0.09)	0.02	(0.02)	0.01	(0.01)	-0.05^{**}	(0.02)	136	0.25
IND	0.25^{***}	(0.09)	0.00	(0.03)	-0.05	(0.03)	-0.16^{***}	(0.05)	111	0.24
ISR	0.09	(0.10)	0.02	(0.06)	0.06^{*}	(0.03)	-0.00	(0.03)	120	0.12
KOR	0.27^{***}	(0.09)	0.09^{**}	(0.04)	-0.01	(0.04)	-0.00	(0.04)	136	0.29
LTU	0.11	(0.10)	0.32^{***}	(0.10)	0.16	(0.12)	-0.02	(0.06)	107	0.20
LVA	0.09	(0.11)	0.30^{**}	(0.12)	-0.22	(0.19)	-0.33^{***}	(0.10)	107	0.38
MEX	0.06	(0.09)	-0.06^{**}	(0.03)	0.01	(0.01)	-0.01	(0.03)	136	0.09
MYS	-0.02	(0.11)	0.25^{*}	(0.14)	-0.13	(0.23)	-0.04	(0.03)	95	0.09
PER	0.03	(0.09)	0.17^{**}	(0.07)	0.03^{*}	(0.01)	-0.02	(0.05)	128	0.10
PHL	0.11	(0.10)	0.16^{**}	(0.07)	0.04	(0.05)	-0.10^{***}	(0.03)	121	0.25
POL	0.36^{***}	(0.11)	0.13^{*}	(0.07)	0.02	(0.04)	-0.00	(0.04)	99	0.21
ROU	0.34^{***}	(0.10)	0.11^{**}	(0.05)	0.01	(0.01)	-0.13^{***}	(0.04)	116	0.48
RUS	0.03	(0.09)	0.24^{***}	(0.05)	0.02^{***}	(0.00)	-0.04	(0.05)	119	0.26
SVK	0.19^{**}	(0.09)	0.30	(0.20)	-0.25	(0.15)	-0.12	(0.15)	116	0.14
SVN	0.08	(0.10)	0.97^{***}	(0.17)	-0.30^{***}	(0.11)	-0.17^{**}	(0.07)	116	0.38
THA	0.40^{***}	(0.09)	0.13^{*}	(0.07)	-0.11	(0.07)	-0.06	(0.04)	124	0.43
TUR	0.03	(0.09)	0.20^{***}	(0.04)	0.00	(0.00)	-0.06	(0.04)	120	0.32
ZAF	-0.10	(0.09)	0.08^{*}	(0.05)	-0.03	(0.03)	-0.03	(0.03)	127	0.09

Note: This table reports the estimation results of equation (3) for each country, where the dependent variable is other investment inflows scaled by annualized trend GDP. CF_{t-1} denotes the lagged dependent variable; *GDP growth* refers to the one-year-ahead real GDP growth forecast; *Inflation* is the one-year-ahead inflation forecast; and *CA Balance* is the one-year-ahead forecast of the current account balance-to-GDP ratio. *N* indicates the number of observations. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Table A8. Net capital inflows and economic forecasts

	CF_{t-1}		GDP Growth		Inflation		CA Balance			
	Coef.	(S.E.)	Coef.	(S.E.)	Coef.	(S.E.)	Coef.	(S.E.)	N	R^2
ARG	0.02	(0.10)	0.13***	(0.04)	0.00	(0.00)	-0.23***	(0.04)	124	0.37
BOL	0.05	(0.09)	0.32	(0.24)	0.20**	(0.10)	-0.12***	(0.04)	127	0.23
BRA	0.10	(0.10)	0.11**	(0.05)	-0.04	(0.03)	-0.15***	(0.05)	116	0.23
CHL	0.27***	(0.09)	0.05	(0.08)	0.05	(0.06)	-0.17**	(0.08)	128	0.33
COL	0.23**	(0.11)	0.14***	(0.04)	-0.04	(0.04)	-0.16***	(0.05)	96	0.42
CRI	-0.06	(0.10)	0.27**	(0.11)	0.02	(0.04)	-0.38***	(0.10)	103	0.26
CZE	0.14	(0.10)	0.17	(0.14)	-0.08	(0.10)	-0.04	(0.12)	116	0.06
EST	0.02	(0.10)	0.20**	(0.08)	0.06	(0.09)	-0.24***	(0.05)	107	0.49
HRV	0.06	(0.10)	0.29**	(0.12)	-0.12	(0.15)	-0.33***	(0.07)	107	0.70
IDN	0.23**	(0.10)	0.11**	(0.05)	0.04**	(0.02)	-0.15***	(0.04)	112	0.37
IND	0.40***	(0.10)	0.07*	(0.04)	0.01	(0.04)	0.01	(0.06)	106	0.21
ISR	0.20**	(0.09)	-0.15	(0.12)	0.25***	(0.08)	0.07	(0.07)	120	0.28
KOR	0.47***	(0.09)	0.01	(0.04)	0.05	(0.04)	-0.09**	(0.04)	136	0.57
LTU	-0.27**	(0.10)	0.38***	(0.08)	0.08	(0.09)	-0.30***	(0.05)	107	0.52
LVA	0.08	(0.11)	0.29***	(0.07)	-0.04	(0.11)	-0.23***	(0.06)	107	0.56
MEX	0.05	(0.09)	0.10**	(0.04)	0.01	(0.01)	-0.14***	(0.05)	136	0.21
MYS	0.11	(0.11)	0.58***	(0.22)	-0.96***	(0.34)	-0.10**	(0.05)	95	0.26
PER	0.11	(0.09)	0.34***	(0.08)	0.04**	(0.02)	-0.03	(0.05)	128	0.26
PHL	0.15	(0.09)	0.11	(0.10)	0.13	(0.09)	-0.13**	(0.05)	121	0.22
POL	0.29**	(0.11)	0.14	(0.09)	-0.00	(0.04)	-0.11*	(0.06)	99	0.27
ROU	0.01	(0.10)	0.29***	(0.07)	0.02**	(0.01)	-0.27***	(0.05)	116	0.49
RUS	0.21**	(0.10)	0.15**	(0.06)	0.01*	(0.01)	-0.12*	(0.06)	119	0.23
SVK	-0.04	(0.10)	0.30***	(0.10)	0.12	(0.08)	-0.11	(0.07)	116	0.25
SVN	0.07	(0.10)	0.16***	(0.06)	0.04	(0.05)	-0.23***	(0.04)	116	0.59
THA	0.16	(0.10)	0.24***	(0.07)	0.01	(0.08)	-0.11**	(0.04)	124	0.46
TUR	-0.07	(0.10)	0.25***	(0.07)	-0.00	(0.01)	-0.18***	(0.06)	120	0.31
ZAF	0.26***	(0.09)	0.12**	(0.06)	0.01	(0.04)	-0.15***	(0.04)	127	0.33

Note: This table reports the estimation results of equation (3) for each country, where the dependent variable is net capital inflows scaled by annualized trend GDP. CF_{t-1} denotes the lagged dependent variable; *GDP growth* refers to the one-year-ahead real GDP growth forecast; *Inflation* is the one-year-ahead inflation forecast; and *CA Balance* is the one-year-ahead forecast of the current account balance-to-GDP ratio. *N* indicates the number of observations. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

B. A Simple Model

We present a simple small open economy model that highlights the endogeneity problem and illustrates how our identification strategy recovers their causal effects.

Setup

Consider a simple infinite-horizon small open production economy similar to Vegh (2013), Schmitt-Grohé and Uribe (2017), and Fernández and Vicondoa (2024). The representative household solves the following problem:

$$\max_{\{c_t, i_t, b_t\}} E_0 \sum_{t=0}^{\infty} \beta^t \log(c_t),$$

subject to the sequence of budget constraints

$$c_t + i_t + R_t b_{t-1} \leq y_t + b_t,$$

where $\beta \in (0,1)$ is the discount factor, c_t denotes consumption, i_t is investment, b_t denotes external debt, and R_t is the global interest rate. Following the standard balance of payments definitions, capital inflows are defined as the change in external debt: $cf_t \equiv b_t - b_{t-1}$.

The capital stock evolves according to

$$k_{t+1} = (1-\delta)k_t + i_t,$$

with depreciation rate $\delta \in (0,1)$. Output is produced using a Cobb–Douglas technology,

$$y_t = A_t X_t k_t^{\alpha},$$

where $\alpha \in (0,1)$, A_t is domestic productivity, and X_t captures global factors that directly affect output. The introduction of X_t allows global factors to influence output through channels other than capital inflows, which is crucial for evaluating identification strategies based on global instruments.

Domestic productivity and the global interest rate follow AR(1) processes:

$$lnA_t = \rho_A lnA_{t-1} + \varepsilon_t^A,$$

$$lnR_t = (1-\rho_R) ln\bar{R} + \rho_R lnR_{t-1} + \varepsilon_t^R,$$

where $\bar{R}$ is the steady-state global interest rate, ε_t^A is a productivity shock, and ε_t^R is a global interest-rate (credit-supply) shock capturing changes in global financial conditions.

We assume that the auxiliary component X_t evolves according to

$$lnX_t = \rho_X lnX_{t-1} + \chi \varepsilon_{t-1}^R,$$

where the parameter χ captures the extent to which global financial conditions affect output directly—beyond their impact through capital inflows. As we assume that the global interest-rate shock is the only source of global variation in the model, specifying X_t as a function of ε_{t-1}^R provides a parsimonious way to allow for such direct effects without introducing additional global factors.[32]

The economy is driven by two shocks: (i) a productivity shock, ε_t^A; and (ii) a global interest-rate (credit-supply) shock, ε_t^R. In this parsimonious setup, productivity shocks naturally correspond to pull (fundamental) factors, whereas global interest-rate shocks capture push (global credit supply) factors. Capital inflows respond to both. Higher productivity raises desired investment and thereby increases capital inflows, while an easing in global financial conditions boosts capital inflows by lowering borrowing costs. Importantly, global financial conditions also affect domestic output through channels other than capital inflows, as captured by the auxiliary component X_t.

Log-linearizing the model around the steady state yields the following system of equations for output and capital inflows:[33]

$$\hat{y}_{t+1} = (1+\lambda_\alpha)E_t\hat{A}_{t+1} + (1+\lambda_\alpha)\hat{X}_{t+1} - \lambda_\alpha\tilde{R}_t + \varepsilon_{t+1}^A,$$

$$\widetilde{CF}_t = \gamma_{CF}E_t\hat{y}_{t+1} + \omega\tilde{R}_t + S_t,$$

where hatted variables represents log deviations from steady state, $\widetilde{CF}_t$ denotes the capital inflows scaled by steady-state output, and $\tilde{R}_t \equiv (R_t - \bar{R})/MPK^*$ with MPK^* denoting the steady-state marginal product of capital. These equations suggest that a simple regression of output on capital inflows would be biased because observed capital inflows contain an endogenous component driven by expectations about future output.

Identification Strategy

In this model, the causal effect of capital inflows on output is given by the response of output to an exogenous global interest-rate shock operating through the capital-inflow channel:

$$\theta \equiv \frac{\partial\hat{y}_{t+1}/\partial\varepsilon_t^R}{\partial\widetilde{CF}_t/\partial\varepsilon_t^R} = -\frac{\lambda_\alpha}{\omega}.$$

[32] The timing assumption that the global interest-rate shock affects X_t with a lag is made primarily for expositional simplicity. It implies that X_{t+1} is predetermined at time t, so that $E_tX_{t+1} = X_{t+1}$. This timing structure is also consistent with the mechanism of the model, in which global financial conditions affect output through investment and capital accumulation, so that changes in borrowing costs today translate into output only in the subsequent period.

[33] The detailed derivations underlying the results in this section are provided at the end of this section.

This object isolates the effect of capital inflows induced by global credit supply shocks, abstracting from the direct effect of global interest-rate shocks on output through X_{t+1}.

Empirical strategies based on global instruments generally fail to identify θ. Consider a global instrument Z_t^G associated with exogenous variation in global financial conditions. The corresponding 2SLS estimator is

$$\beta^{GIV} = \frac{Cov(\hat{y}_{t+1}, Z_t^G)}{Cov(\widetilde{CF}_t, Z_t^G)} \approx \theta + \underbrace{\frac{1+\lambda_\alpha}{\omega}\frac{Cov\left(\hat{X}_{t+1}, Z_t^G\right)}{Cov\left(\tilde{R}_t, Z_t^G\right)}}_{Exclusion\ bias} - \underbrace{\theta\frac{\gamma_{CF}}{\omega}\frac{Cov(E_t\hat{y}_{t+1}, Z_t^G)}{Cov\left(\tilde{R}_t, Z_t^G\right)}}_{Expectation\ bias}.$$

The exclusion bias reflects a violation of the exclusion restriction: global financial shocks affect output not only through capital inflows but also directly through X_{t+1}. The expectation bias arises because global instruments are correlated with expected future output. In other words, capital inflows respond to the changes in expected output driven by the change in X_{t+1}.

To isolate the causal effect, we adopt a two-stage identification strategy. In the first stage, we purge capital inflows of their predictable component using observable macroeconomic forecasts W_t that span $E_t\hat{y}_{t+1}$. We then obtain residuals after projecting observed capital inflows on W_t and the state vector S_t:

$$\widetilde{CF}_t = \pi W_t + \Gamma S_t + u_t \quad \Longrightarrow \quad \hat{u}_t = \widetilde{CF}_t - \hat{\pi} W_t - \hat{\Gamma} S_t.$$

The residual $\hat{u}_t$ captures the component of capital inflows not explained by expected fundamentals or the current state of the economy. In other words, $\hat{u}_t$ primarily reflects credit-supply-driven variation in capital inflows.

In the second stage, we regress output on $\hat{u}_t$:

$$\hat{y}_{t+1} = \beta\hat{u}_t + \Theta Z_t + v_{t+1},$$

where Z_t denotes control variables. By construction, $\hat{u}_t$ is orthogonal to expected fundamentals, implying:

$$\beta = -\frac{\lambda_\alpha Cov\left(\tilde{R}_t, \hat{u}_t\right)}{Var(\hat{u}_t)}.$$

The first-state residual satisfies

$$\hat{u}_t = \omega\tilde{R}_t + \eta_t,$$

where η_t collects residual variation in capital flows unrelated to the credit-supply shock, including measurement error. Under the standard exogeneity assumption, $Cov\left(\tilde{R}_t, \eta_t\right) = 0$. Thus,

$$\beta = -\frac{\lambda_\alpha Cov(\tilde{R}_t, \hat{u}_t)}{Var(\hat{u}_t)} = \left(-\frac{\lambda_\alpha}{\omega}\right)\frac{\omega^2 Var(\tilde{R}_t)}{Var(\hat{u}_t)} = \theta \cdot \underbrace{\frac{\omega^2 Var(\tilde{R}_t)}{Var(\hat{u}_t)}}_{\text{attenuation} \in (0,1]} .$$

If $\hat{u}_t$ contains extra noise η_t, the term $\omega^2 Var(\tilde{R}_t)/Var(\hat{u}_t) < 1$ attenuates the estimate toward zero. In the ideal case, if the first-stage regression perfectly purges expectations so that $\hat{u}_t = \omega \hat{R}_t$, then $Var(\hat{u}_t) = \omega^2 Var(\hat{R}_t)$ and $\beta = \theta$.

In sum, the model clarifies why global-instrument strategies fail and why purging capital inflows of expectation-driven components can allow us to recover their causal effects on output. The accuracy of our estimates depends on the quality of expectation measures used in the first stage. While imperfect measurement of expectations may lead to underestimation of the effects, it is unlikely to reverse their sign.

Model derivations

Here we provide the detailed derivations and full expressions underlying the model presented.

Output in log deviations is given by:

$$\hat{y}_t = \hat{A}_t + \hat{X}_t + \alpha \hat{k}_t, \tag{B.1}$$

The household's optimality conditions yield the standard Euler equations:

$$\frac{1}{c_t} = \beta E_t \left[\frac{1}{c_{t+1}} (\alpha A_{t+1} X_{t+1} k_{t+1}^{\alpha-1} + 1 - \delta)\right], \tag{B.2}$$

$$\frac{1}{c_t} = \beta E_t \left[\frac{1}{c_{t+1}} R_t\right]. \tag{B.3}$$

Subtracting (B.2) from (B.3) and linearizing around the steady state gives:

$$E_t\left[\hat{A}_{t+1} + \hat{X}_{t+1} - (1-\alpha)\hat{k}_{t+1}\right] = \frac{R_t - R^*}{MPK^*},$$

where $MPK^* \equiv \alpha A^* X^* (k^*)^{\alpha-1} = R^* - (1-\delta)$. Using Equation (B.1), this expression simplifies to:

$$E_t \hat{y}_{t+1} - \hat{k}_{t+1} = \frac{R_t - R^*}{MPK^*}.$$

Defining $\tilde{R}_t \equiv (R_t - R^*)/MPK^*$, we obtain

$$\hat{k}_{t+1} = E_t \hat{y}_{t+1} - \tilde{R}_t. \tag{B.4}$$

Substituting $E_t \hat{y}_{t+1} = E_t \hat{A}_{t+1} + \hat{X}_{t+1} + \alpha \hat{k}_{t+1}$ into Equation (B.12) yields:

$$\hat{k}_{t+1} = \frac{1}{1-\alpha}\left[E_t\hat{A}_{t+1} + \hat{X}_{t+1} - \tilde{R}_t\right]. \qquad (B.5)$$

Output in period $t+1$ can then be written as

$$\begin{aligned}\hat{y}_{t+1} &\equiv \hat{A}_{t+1} + \hat{X}_{t+1} + \alpha\hat{k}_{t+1} \\ &= (1+\lambda_\alpha)E_t\hat{A}_{t+1} + (1+\lambda_\alpha)\hat{X}_{t+1} - \lambda_\alpha\tilde{R}_t + \varepsilon^A_{t+1},\end{aligned} \qquad (B.6)$$

where $\lambda_\alpha \equiv \alpha/(1-\alpha)$.

Using $i^* = \delta k^*$,

$$\hat{\imath}_t = \frac{1}{\delta}\hat{k}_{t+1} - \frac{1-\delta}{\delta}\hat{k}_t = \frac{1}{\delta}E_t\hat{y}_{t+1} - \frac{1}{\delta}\tilde{R}_t - \frac{1-\delta}{\delta}\hat{k}_t. \qquad (B.7)$$

We approximate capital flows $cf_t \equiv b_t - b_{t-1} = c_t + i_t - y_t + (R_t - 1)b_{t-1}$ around the following steady–state ratios:

$$s_c \equiv \frac{c^*}{y^*}, \quad s_i \equiv \frac{i^*}{y^*}, \quad s_b \equiv \frac{(R^*-1)b^*}{y^*}, \quad \psi_R \equiv \frac{b^*MPK^*}{y^*}.$$

Define the scaled capital inflows:

$$\widetilde{CF}_t \equiv \frac{cf_t}{y^*}.$$

A first-order Taylor expansion around the steady state yields:

$$\begin{aligned}\widetilde{CF}_t &\equiv \frac{cf_t}{y^*} = \frac{c_t}{y^*} + \frac{i_t}{y^*} - \frac{y_t}{y^*} + \frac{(R_t-1)b_{t-1}}{y^*} \\ &\approx \frac{c_t - c^*}{y^*} + \frac{i_t - i^*}{y^*} - \frac{y_t - y^*}{y^*} + \frac{(R^*-1)(b_{t-1} - b^*)}{y^*} + \frac{b^*(R_t - R^*)}{y^*} \\ &= s_c\hat{c}_t + s_i\hat{\imath}_t - \hat{y}_t + s_b\hat{b}_{t-1} + \psi_R\tilde{R}_t.\end{aligned}$$

Substituting Equation (B.7) into the expression above, we obtain:

$$\widetilde{CF}_t \approx \gamma_{CF}E_t\hat{y}_{t+1} + \omega\hat{R}_t + S_t, \qquad (B.8)$$

where $\gamma_{CF} \equiv s_i/\delta$, $\omega \equiv \psi_R - \gamma_{CF}$, and $S_t \equiv s_c\hat{c}_t - \hat{y}_t - s_i(1-\delta)/\delta\hat{k}_t + s_b\hat{b}_{t-1}$. Equation (B.8) shows that capital flows depend on expected future output, the cost of external borrowing, and the current state of the economy. Specifically, capital flows load positively on expected future output ($\gamma_{CF} > 0$). The response to the cost of external borrowing is governed by $\omega = \psi_R - \gamma_{CF}$. In theory, the sign of ω is ambiguous, reflecting the offsetting effects of higher interest payments ($+\psi_R$) and lower investment demand ($-\gamma_{CF}$). Under standard calibrations with moderate debt ratios, the investment effect dominates, implying $\omega < 0$ for debtor economies ($b^* > 0$).[34]

Global-IV estimator. Let Z_t^G denote a global IV associated with exogenous variation in global financial conditions. We assume that Z_t^G is orthogonal to country-specific productivity innovations and predetermined state variable (i.e., $Cov(A_{t+1}, Z_t^G) = 0$ and $Cov(S_t, Z_t^G) = 0$).

The 2SLS estimator obtained by instrumenting capital inflows with Z_t^G is

$$\beta^{GIV} = \frac{Cov(\hat{y}_{t+1}, Z_t^G)}{Cov(\widetilde{CF}_t, Z_t^G)}.$$

Using Equation (B.6) and (B.8), the numerator and denominator can be written as

$$Cov(\hat{y}_{t+1}, Z_t^G) = -\lambda_\alpha Cov\big(\tilde{R}_t, Z_t^G\big) + (1+\lambda_\alpha) Cov\big(\hat{X}_{t+1}, Z_t^G\big),$$

and

$$Cov\big(\widetilde{CF}_t, Z_t^G\big) = \ \omega Cov\big(\tilde{R}_t, Z_t^G\big) + \gamma_{CF} Cov(E_t\hat{y}_{t+1}, Z_t^G).$$

Dividing numerator and denominator by $\omega Cov(\tilde{R}_t, Z_t^G)$ yields

$$\beta^{GIV} = \frac{\theta + \frac{1+\lambda_\alpha}{\omega}\frac{Cov(\hat{X}_{t+1}, Z_t^G)}{Cov(\tilde{R}_t, Z_t^G)}}{1 + \frac{\gamma_{CF}}{\omega}\frac{Cov(E_t\hat{y}_{t+1}, Z_t^G)}{Cov(\tilde{R}_t, Z_t^G)}}.$$

Applying a first-order approximation yields

$$\beta^{GIV} \approx \theta + \underbrace{\frac{1+\lambda_\alpha}{\omega}\frac{Cov\big(\hat{X}_{t+1}, Z_t^G\big)}{Cov\big(\tilde{R}_t, Z_t^G\big)}}_{Exclusion\ bias} - \underbrace{\theta\frac{\gamma_{CF}}{\omega}\frac{Cov(E_t\hat{y}_{t+1}, Z_t^G)}{Cov\big(\tilde{R}_t, Z_t^G\big)}}_{Expectation\ bias}.$$

Estimator purging expectation-driven components. As we regress output on the residual component of capital inflows in the second stage, β is given by:

$$\begin{aligned}\beta &= \frac{Cov(\hat{y}_{t+1}, \hat{u}_t)}{Var(\hat{u}_t)} \\ &= \frac{(1+\lambda_\alpha)Cov\big(E_t\hat{A}_{t+1}, \hat{u}_t\big) + (1+\lambda_\alpha)Cov\big(\hat{X}_{t+1}, \hat{u}_t\big) - \lambda_\alpha Cov\big(\tilde{R}_t, \hat{u}_t\big) + Cov(\varepsilon_{t+1}^A, \hat{u}_t)}{Var(\hat{u}_t)}\end{aligned}$$

[34] Suppose $\omega > 0$. Then, $\frac{b^*}{y^*}MPK^* - \frac{i^*}{y^*}\frac{1}{\delta} > 0 \iff \frac{b^*}{k^*} > \frac{1}{MPK^*}$. With reasonable values such as $MPK^* = 0.1$, this requires $\frac{b^*}{k^*} > 10$, which is unrealistic.

$$= -\frac{\lambda_\alpha Cov(\tilde{R}_t, \hat{u}_t)}{Var(\hat{u}_t)},$$

where the second equality follows from the properties of the first-stage residual $\hat{u}_t$ and the timing of information. By construction, $\hat{u}_t$ is orthogonal to W_t, which span $E_t\hat{A}_{t+1}$ and $\hat{X}_{t+1}$, and the TFP innovation ε^A_{t+1} is unpredictable at time t. As a result, all covariance terms except the one involving $\hat{R}_t$ vanish.

C. Data Sources and Availability

Beginning with 28 emerging market economies that have Consensus forecast data, quarterly capital flow data, and real GDP data available at least since 2000Q1, we make a few adjustments to address country-specific issues.[35] These adjustments leave us with a quarterly unbalanced panel of 27 emerging market economies from 1990Q1 to 2024Q4. The data are obtained through Haver Analytics unless otherwise noted. Corresponding haver codes are provided in parentheses.

Nominal GDP: GDP at current US$, not seasonally adjusted
(N*NGPD@G10, N*NGPD@EMERGE)

Real GDP: GDP, chained 2010 US$, seasonally adjusted[36]
(S*NGPC@G10, H*NGPC@G10, S*NGPC@EMERGE, H*NGPC@EMERGE)

CPI: Headline consumer price index (Q*HCPI@WBPRICES)

Private consumption: Real private consumption expenditure, seasonally adjusted
(S*GCR@IFS, S*NCPC@G10, S*NCPC@EMERGE, H*NCPC@G10, H*NCPC@EMERGE)

Investment: Real gross fixed capital formation, seasonally adjusted
(S*GIFR@IFS, S*NFC@G10, S*NFC@EMERGE, H*NFC@G10, H*NFC@EMERGE)

Exports: Real exports of goods and services, seasonally adjusted
(S*GER@IFS, S*NXC@G10, S*NXC@EMERGE, H*NXC@G10, H*NXC@EMERGE)

Imports Real imports of goods and services, seasonally adjusted
(S*GMR@IFS, S*NMC@G10, S*NMC@EMERGE, H*NMC@G10, H*NMC@EMERGE)

NEER: Nominal effective exchange rate, average
(C*EINC@IFS, C*EINU@IFS, N*XJNB@G10, N*XJNB@EMERGE)

Short-term interest rate: 3-Month interest rate or nearest equivalent, average
(N*RI3@G10, N*RG3M@G10, N*G3M@G10, N*RL3@G10, N*RI3@EMERGE, N*RG3M@EMERGE, N*G3M@EMERGE, N*RL3@EMERGE, R*G3M@INTDAILY, R*X3M@INTDAILY, R*T3M@INTDAILY, R*E3M@INTDAILY, R*M3M@INTDAILY, R*G4B@INTDAILY, R*D3M@INTDAILY, R*W3M@INTDAILY, R*Y3M@INTDAILY, T*G3M@INTDAILY, T*L3M@INTDAILY, R*B3A@INTDAILY, R*L3M@INTDAILY, R*L1M@INTDAILY, R*N3L@INTDAILY, R*S3M@INTDAILY, I*A3M@INTDAILY, R*I3M@INTDAILY, R*O3M@INTDAILY, T*I3M@INTDAILY, I*M3M@INTDAILY, R*K3M@INTDAILY, L*M3M@INTDAILY, B*M3M@INTDAILY D*M3M@INTDAILY, I*M3M@INTDAILY, R*3MB@INTDAILY, R186B3M@INTDAILY)

Long-term interest rate: 10-Year interest rate or nearest equivalent, average
(R*MA@INTDAILY, R*GA@INTDAILY, T*GA@INTDAILY, R*VA@INTDAILY, R*TA@INTDAILY, R*GAB@INTDAILY, R*GAR@INDAILY, R*BA@INTDAILY)

Equity prices: National stock market indexes or MSCI stock market indexes with gross dividends based on local currency or IFS share prices
(N*FKAV@G10, N*FKAV@EMERGE, N*FKAC@EMERGE, N*KMGL@G10, N*KMGL@EMERGE, C*IS@IFS)

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[35] First, we exclude Hungary due to the unusually large size of its FDI flows and the high correlation between FDI inflows and outflows. For example, in 2020Q2, FDI inflows and outflows reached $139 billion and $138 billion, respectively, while nominal GDP was $177 billion. Second, we drop observations for Brazil prior to 1995, as inflation forecasts reached 5,000% in the first quarter of 1994.

[36] "S" indicates that the series is seasonally adjusted by the source, while "H" indicates that the series is seasonally adjusted by Haver. When both series are available, the longer series is used.

Public debt to GDP: IMF Global Debt Database, Mbaye et al. (2018)
Capital account openness: Chinn and Ito (2006)
Financial development index: IMF Financial Development Index Database, Svirydzenka (2016)

Table C1. Summary statistics

	Obs.	Mean	Sd	Min	p25	p50	p75	Max
Gross inflows	3302	1.6	2.1	-12.3	0.5	1.3	2.4	20.7
Portfolio debt inflows	3261	0.3	0.9	-5.7	-0.1	0.1	0.5	9.6
Portfolio equity inflows	3280	0.1	0.4	-6.4	-0.0	0.0	0.1	4.0
FDI inflows	3310	0.8	0.9	-6.7	0.3	0.6	1.1	12.3
Other inflows	3302	0.4	1.7	-13.4	-0.2	0.3	0.9	20.1
Gross outflows	3284	0.9	1.7	-13.1	0.1	0.6	1.4	20.4
Portfolio debt outflows	3153	0.2	0.7	-7.4	-0.0	0.0	0.3	10.7
Portfolio equity outflows	3234	0.1	0.4	-3.9	0.0	0.0	0.2	3.8
FDI outflows	3310	0.3	0.6	-9.1	0.0	0.2	0.4	9.6
Other outflows	3307	0.4	1.4	-13.9	-0.2	0.2	0.7	19.2
Netflows	3276	0.7	1.7	-12.4	-0.2	0.6	1.5	19.0
Portfolio debt netflows	3266	0.1	1.1	-6.2	-0.3	0.0	0.5	9.2
Portfolio equity netflows	3281	-0.1	0.6	-10.0	-0.2	-0.0	0.1	4.3
FDI netflows	3310	0.5	0.9	-6.9	0.1	0.4	0.8	12.1
Other netflows	3299	0.1	1.7	-14.0	-0.6	0.1	0.8	11.7
Real GDP growth	3410	0.9	2.3	-30.3	0.2	1.0	1.7	26.5
Inflation(HCPI)	3570	2.9	8.7	-4.0	0.5	1.2	2.3	212.8
Private consumption growth	3223	0.9	2.8	-25.9	0.2	1.0	1.8	19.9
Investment growth	3265	1.0	6.3	-70.4	-1.2	1.2	3.6	74.8
Exports growth	3254	1.4	6.0	-57.5	-1.0	1.4	3.9	43.1
Imports growth	3254	1.4	6.4	-82.3	-1.1	1.6	4.4	30.1
Trade balance/GDP	3275	0.5	5.9	-19.4	-3.0	0.0	3.5	27.2
NEER changes	3475	-0.9	6.3	-84.2	-1.9	-0.1	1.4	40.2
Short-term interest	2486	8.4	10.6	-2.0	2.9	5.5	10.1	113.2
Long-term interest	1927	6.2	3.5	-0.4	3.8	5.8	7.9	28.0
Equity returns	3021	2.4	11.9	-111.5	-3.0	2.3	8.1	66.1
House price growth	2227	0.4	3.3	-30.3	-0.9	0.4	1.8	22.6

Note: The sample is a quarterly unbalanced panel covering 27 emerging market economies from 1990Q1 to 2024Q4. Capital flows are scaled by annualized trend GDP. Returns, changes, and growth rates are computed as log differences. Data availability varies by country. Detailed information on country and variable coverage is provided in Tables C2-6.

Table C2. Capital inflows data availability by country

Country	Portfolio debt	Portfolio equity	FDI	Other investment
Argentina	1990q1-2024q4	1990q1-2024q4	1990q1-2024q4	1990q1-2024q4
Bolivia	1990q1-2024q4	1990q1-2024q4	1990q1-2024q4	1990q1-2024q4
Brazil	1995q1-2024q4	1995q1-2024q4	1995q1-2024q4	1995q1-2024q4
Chile	1991q1-2024q4	1991q1-2024q4	1991q1-2024q4	1991q1-2024q4
Colombia	1996q1-2024q4	1996q1-2024q4	1996q1-2024q4	1996q1-2024q4
Costa Rica	1999q1-2024q4	1999q1-2024q4	1999q1-2024q4	1999q1-2024q4
Croatia	1993q1-2024q4	1993q1-2024q4	1993q1-2024q4	1993q1-2024q4
Czech Republic	1993q1-2024q4	1993q1-2024q4	1993q1-2024q4	1993q1-2024q4
Estonia	1992q1-2024q4	1992q1-2024q4	1992q1-2024q4	1992q1-2024q4
India	1990q1-2024q4	1990q1-2024q4	1990q1-2024q4	1990q1-2024q4
Indonesia	1990q1-2024q4	1990q1-2024q4	1990q1-2024q4	1990q1-2024q4
Israel	1990q1-2024q4	1990q1-2024q4	1990q1-2024q4	1990q1-2024q4
Korea, South	1990q1-2024q4	1990q1-2024q4	1990q1-2024q4	1990q1-2024q4
Latvia	1996q1-2024q4	1996q1-2024q4	1993q1-2024q4	1993q1-2024q4
Lithuania	1994q1-2024q4	1993q1-2024q4	1993q1-2024q4	1993q1-2024q4
Malaysia	2002q1-2024q4	2002q1-2024q4	1999q1-2024q4	2001q1-2024q4
Mexico	1990q1-2024q4	1990q1-2024q4	1990q1-2024q4	1990q1-2024q4
Peru	1991q1-2024q4	1991q1-2024q4	1991q1-2024q4	1991q1-2024q4
Philippines	1990q1-2024q4	1990q1-2024q4	1990q1-2024q4	1990q1-2024q4
Poland	1995q1-2024q4	1995q1-2024q4	1990q1-2024q4	1990q1-2024q4
Romania	1991q1-2024q4	1991q1-2024q4	1991q1-2024q4	1991q1-2024q4
Russia	1994q1-2024q4	1994q1-2024q4	1994q1-2024q4	1994q1-2024q4
Slovak Republic	1994q1-2024q4	1993q1-2024q4	1993q1-2024q4	1993q1-2024q4
Slovenia	1992q1-2024q4	1992q1-2024q4	1992q1-2024q4	1992q1-2024q4
South Africa	1990q1-2024q4	1990q1-2024q4	1990q1-2024q4	1990q1-2024q4
Thailand	1990q1-2024q4	1990q1-2024q4	1990q1-2024q4	1990q1-2024q4
Türkiye	1990q1-2024q4	1990q1-2024q4	1990q1-2024q4	1990q1-2024q4

Table C3. Capital outflows data availability by country

Country	Portfolio debt	Portfolio equity	FDI	Other investment
Argentina	1990q1-2024q4	1990q1-2024q4	1990q1-2024q4	1990q1-2024q4
Bolivia	1990q1-2024q4	1990q1-2024q4	1990q1-2024q4	1990q1-2024q4
Brazil	1995q1-2024q4	1995q1-2024q4	1995q1-2024q4	1995q1-2024q4
Chile	1991q1-2024q4	1991q1-2024q4	1991q1-2024q4	1991q1-2024q4
Colombia	1996q1-2024q4	1996q1-2024q4	1996q1-2024q4	1996q1-2024q4
Costa Rica	1999q1-2024q4	1999q1-2024q4	1999q1-2024q4	1999q1-2024q4
Croatia	1993q1-2024q4	1993q1-2024q4	1993q1-2024q4	1993q1-2024q4
Czech Republic	1997q1-2024q4	1993q1-2024q4	1993q1-2024q4	1993q1-2024q4
Estonia	1992q1-2024q4	1992q1-2024q4	1992q1-2024q4	1992q1-2024q4
India	1990q1-2000q4	1990q1-2024q4	1990q1-2024q4	1990q1-2024q4
Indonesia	1990q1-2024q4	1990q1-2024q4	1990q1-2024q4	1990q1-2024q4
Israel	1990q1-2024q4	1990q1-2024q4	1990q1-2024q4	1990q1-2024q4
Korea, South	1990q1-2024q4	1990q1-2024q4	1990q1-2024q4	1990q1-2024q4
Latvia	1993q1-2024q4	1993q1-2024q4	1993q1-2024q4	1993q1-2024q4
Lithuania	1995q1-2024q4	1993q1-2024q4	1995q1-2024q4	1993q1-2024q4
Malaysia	2002q1-2024q4	2002q1-2024q4	1999q1-2024q4	1999q1-2024q4
Mexico	1990q1-2024q4	1990q1-2024q4	1990q1-2024q4	1990q1-2024q4
Peru	1991q1-2024q4	1991q1-2024q4	1991q1-2024q4	1991q1-2024q4
Philippines	1990q1-2024q4	1990q1-2024q4	1990q1-2024q4	1990q1-2024q4
Poland	1994q4-2024q4	1995q1-2024q4	1991q1-2024q4	1990q1-2024q4
Romania	1991q1-2024q4	1991q1-2024q4	1991q1-2024q4	1991q1-2024q4
Russia	1994q1-2024q4	1994q1-2024q4	1994q1-2024q4	1994q1-2024q4
Slovak Republic	1994q1-2024q4	1993q1-2024q4	1993q1-2024q4	1993q1-2024q4
Slovenia	1992q1-2024q4	1992q1-2024q4	1992q1-2024q4	1992q1-2024q4
South Africa	1990q1-2024q4	1990q1-2024q4	1990q1-2024q4	1990q1-2024q4
Thailand	1990q1-2024q4	1990q1-2024q4	1990q1-2024q4	1990q1-2024q4
Türkiye	1992q1-2024q4	1990q1-2024q4	1990q1-2024q4	1990q1-2024q4

Table C4. Consensus forecasts data availability by country

Country	Real GDP	Consumer Prices	CA Balance
Argentina	1993q1-2024q4	1993q1-2024q4	1993q1-2024q4
Bolivia	1993q1-2024q4	1993q1-2024q4	1993q1-2024q4
Brazil	1995q1-2024q4	1995q1-2024q4	1995q1-2024q4
Chile	1993q1-2024q4	1993q1-2024q4	1993q1-2024q4
Colombia	1993q1-2024q4	1993q1-2024q4	1993q1-2024q4
Costa Rica	1993q1-2024q4	1993q1-2024q4	1993q1-2024q4
Croatia	1998q2-2024q4	1998q2-2024q4	1998q2-2024q4
Czech Republic	1995q1-2024q4	1995q1-2024q4	1995q1-2024q4
Estonia	1998q2-2024q4	1998q2-2024q4	1998q2-2024q4
India	1994q4-2024q4	1994q4-2024q4	1994q4-2024q4
Indonesia	1990q4-2024q4	1990q4-2024q4	1990q4-2024q4
Israel	1995q1-2024q4	1995q1-2024q4	1995q1-2024q4
Korea, South	1990q1-2024q4	1990q1-2024q4	1990q1-2024q4
Latvia	1998q2-2024q4	1998q2-2024q4	1998q2-2024q4
Lithuania	1998q2-2024q4	1998q2-2024q4	1998q2-2024q4
Malaysia	1990q4-2024q4	1990q4-2024q4	1990q4-2024q4
Mexico	1990q1-2024q4	1990q1-2024q4	1990q1-2024q4
Peru	1993q1-2024q4	1993q1-2024q4	1993q1-2024q4
Philippines	1994q4-2024q4	1994q4-2024q4	1994q4-2024q4
Poland	1990q4-2024q4	1990q4-2024q4	1990q4-2024q4
Romania	1995q1-2024q4	1995q1-2024q4	1995q1-2024q4
Russia	1995q1-2024q4	1995q1-2024q4	1995q1-2024q4
Slovak Republic	1995q1-2024q4	1995q1-2024q4	1995q1-2024q4
Slovenia	1995q1-2024q4	1995q1-2024q4	1995q1-2024q4
South Africa	1993q2-2024q4	1993q2-2024q4	1993q2-2024q4
Thailand	1990q4-2024q4	1990q4-2024q4	1990q4-2024q4
Türkiye	1995q1-2024q4	1995q1-2024q4	1995q1-2024q4

Table C5. Macroeconomic variables data availability by country

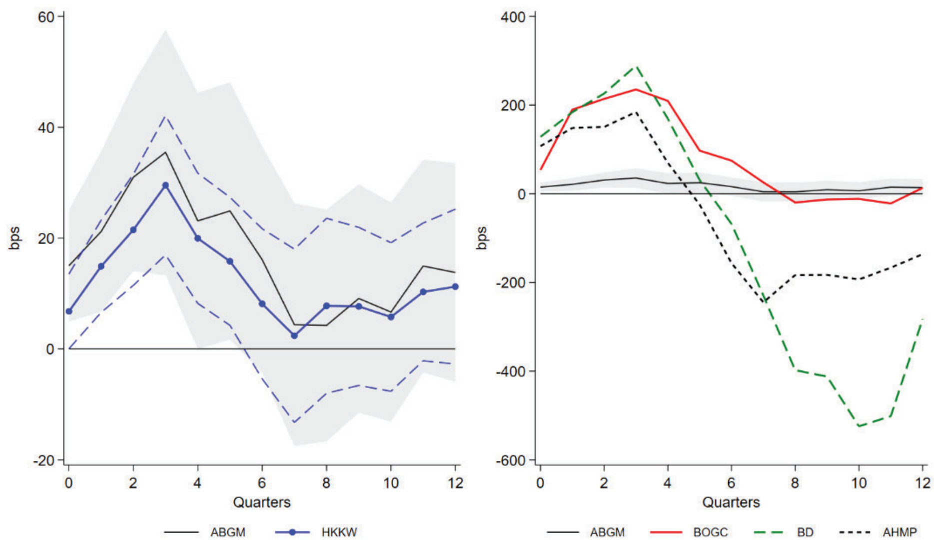
Country	Real GDP	Investment	Priv. Cons.	Govt. Cons	Exports	Imports	HCPI
Argentina	1990q1-2024q4	2004q1-2024q4	2004q1-2024q4	2004q1-2024q4	2004q1-2024q4	2004q1-2024q4	1990q1-2024q4
Bolivia	1990q1-2024q3	1990q1-2024q3	1990q1-2024q3	1990q1-2024q3	1990q1-2024q3	1990q1-2024q3	1990q1-2023q4
Brazil	1995q1-2024q4	1995q1-2024q4	1995q1-2024q4	1995q1-2024q4	1995q1-2024q4	1995q1-2024q4	1995q1-2023q4
Chile	1990q1-2024q4	1996q1-2024q4	1996q1-2024q4	1996q1-2024q4	1996q1-2024q4	1996q1-2024q4	1990q1-2023q4
Colombia	2000q1-2024q4	2005q1-2024q4	2005q1-2024q4	2005q1-2024q4	2005q1-2024q4	2005q1-2024q4	1990q1-2023q4
Costa Rica	1991q1-2024q4	1991q1-2024q4	1991q1-2024q4	1991q1-2024q4	1991q1-2024q4	1991q1-2024q4	1990q1-2023q4
Croatia	2000q1-2024q4	1995q1-2024q3	1995q1-2024q3	1995q1-2024q3	1995q1-2024q3	1995q1-2024q3	1990q1-2023q4
Czech Republic	1996q1-2024q4	1995q1-2024q3	1995q1-2024q3	1995q1-2024q3	1995q1-2024q3	1995q1-2024q3	1991q1-2023q4
Estonia	1995q1-2024q4	1995q1-2024q4	1995q1-2024q4	1995q1-2024q4	1995q1-2024q4	1995q1-2024q4	1998q1-2023q4
India	1996q2-2024q4	1996q2-2024q4	1996q2-2024q4	1996q2-2024q4	1996q2-2024q4	1996q2-2024q4	1990q1-2023q4
Indonesia	1990q1-2024q4	1990q1-2024q4	1990q1-2024q4	1990q1-2024q4	1990q1-2024q4	1990q1-2024q4	1990q1-2023q4
Israel	1995q1-2024q4	1995q1-2024q4	1995q1-2024q4	1995q1-2024q4	1995q1-2024q4	1995q1-2024q4	1990q1-2023q4
Korea, South	1990q1-2024q4	1990q1-2024q4	1990q1-2024q4	1990q1-2024q4	1990q1-2024q4	1990q1-2024q4	1990q1-2023q4
Latvia	1995q1-2024q4	1995q1-2024q4	1995q1-2024q4	1995q1-2024q4	1995q1-2024q4	1995q1-2024q4	1991q1-2023q4
Lithuania	1995q1-2024q4	1995q1-2024q4	1995q1-2024q4	1995q1-2024q4	1995q1-2024q4	1995q1-2024q4	1991q1-2023q4
Malaysia	1991q1-2024q4	1996q1-2024q4	1996q1-2024q4	1996q1-2024q4	1996q1-2024q4	1996q1-2024q4	1990q1-2023q3
Mexico	1990q1-2024q4	1993q1-2024q4	1993q1-2024q4	1993q1-2024q4	1993q1-2024q4	1993q1-2024q4	1990q1-2023q4
Peru	1990q1-2024q4	1990q1-2024q4	1990q1-2024q4	1990q1-2024q4	1990q1-2024q4	1990q1-2024q4	1990q1-2023q4
Philippines	1990q1-2024q4	1990q1-2024q4	2000q1-2024q3	1990q1-2024q4	1990q1-2024q4	1990q1-2024q4	1990q1-2023q4
Poland	1995q3-2024q4	1995q1-2024q3	1995q1-2024q3	1995q1-2024q3	1995q1-2024q3	1995q1-2024q3	1990q1-2023q4
Romania	1995q1-2024q4	1995q1-2024q4	1995q1-2024q4	1995q1-2024q3	1995q1-2024q4	1995q1-2024q4	1991q2-2023q4
Russia	1995q1-2024q3	1995q1-2024q3	1995q1-2024q3	1995q1-2024q3	1995q1-2021q4	1995q1-2021q4	1992q3-2022q1
Slovak Republic	1995q1-2024q4	1995q1-2024q4	1995q1-2024q4	1995q1-2024q4	1995q1-2024q4	1995q1-2024q4	1991q1-2023q4
Slovenia	1995q1-2024q4	1995q1-2024q4	1995q1-2024q4	1995q1-2024q4	1995q1-2024q4	1995q1-2024q4	1990q1-2023q4
South Africa	1990q1-2024q4	1990q1-2024q4	1990q1-2024q4	1990q1-2024q4	1990q1-2024q4	1990q1-2024q4	1990q1-2023q4
Thailand	1993q1-2024q4	1993q1-2024q4	1993q1-2024q4	1993q1-2024q4	1993q1-2024q4	1993q1-2024q4	1990q1-2023q1
Türkiye	1990q1-2024q4	1998q1-2024q4	1998q1-2024q4	1998q1-2024q4	1998q1-2024q4	1998q1-2024q4	1990q4-2023q4

Table C6. Financial variables data availability by country

Country	NEER	Short-term rate	Long-term rate	Equity price	House price
Argentina	1996q2-2024q4	1997q2-2019q3	2014q4-2018q3	1991q1-2024q4	-
Bolivia	1990q1-2024q4	-	-	-	-
Brazil	1995q1-2024q4	1999q3-2023q4	2007q4-2024q4	1995q1-2024q4	2001q1-2024q3
Chile	1990q1-2024q4	1997q3-2023q4	2004q3-2024q4	1993q4-2024q4	2002q1-2024q2
Colombia	1990q1-2024q4	2008q3-2023q4	2002q3-2024q4	2008q1-2024q4	1990q1-2024q2
Costa Rica	1990q1-2024q4	2014q3-2023q4	-	1995q1-2024q4	-
Croatia	1992q1-2024q4	1997q2-2022q4	2008q1-2024q4	2002q2-2024q4	1997q1-2024q2
Czech Republic	1990q1-2024q4	1992q2-2024q4	2000q2-2024q4	1994q3-2024q4	2008q1-2024q2
Estonia	1996q2-2024q4	1999q1-2010q4	-	2001q1-2024q4	2005q1-2024q2
India	1996q2-2024q4	1993q1-2024q4	1996q2-2024q4	1990q1-2024q4	2009q1-2024q2
Indonesia	1996q2-2024q4	1998q1-2024q4	2010q3-2024q4	1993q4-2024q4	2002q1-2024q3
Israel	1990q1-2024q4	1992q1-2024q4	2002q2-2024q4	1997q3-2024q4	1994q1-2024q2
Korea, South	1990q1-2024q4	2004q3-2024q4	2000q4-2024q4	1990q1-2024q4	1990q1-2024q3
Latvia	1992q4-2024q4	1997q4-2013q4	-	2001q1-2024q4	2006q1-2024q3
Lithuania	1996q2-2024q4	1999q1-2014q4	2003q1-2024q4	2001q1-2024q4	1998q4-2024q3
Malaysia	1990q1-2024q4	1997q1-2024q4	1996q1-2024q4	1990q1-2024q4	1990q1-2024q3
Mexico	1990q1-2024q4	1990q1-2024q4	2001q3-2024q4	1990q1-2024q4	2005q1-2024q2
Peru	1996q2-2024q4	2003q3-2021q3	2005q2-2024q4	1998q4-2024q4	1998q1-2024q2
Philippines	1990q1-2024q4	1990q1-2024q4	2000q2-2024q4	1993q1-2024q4	2008q1-2024q2
Poland	1990q1-2024q4	1993q1-2023q4	1999q3-2024q4	1994q3-2024q4	2010q1-2024q2
Romania	1990q1-2024q4	1995q3-2023q4	2011q1-2024q4	1997q4-2024q4	2009q1-2024q2
Russia	1993q4-2024q4	1996q1-2023q4	2003q1-2024q4	1995q3-2024q4	2001q1-2024q2
Slovak Republic	1990q1-2024q4	-	2000q3-2024q4	2000q1-2024q4	2006q1-2024q3
Slovenia	1996q2-2024q4	2003q2-2024q4	2010q4-2024q4	2002q2-2024q4	2007q1-2024q2
South Africa	1990q1-2024q4	1990q1-2024q4	1997q4-2024q4	1990q1-2024q4	1990q1-2024q3
Thailand	1996q2-2024q4	1997q1-2024q4	2001q1-2024q4	1993q1-2024q4	1991q1-2024q3
Türkiye	1996q2-2024q4	2002q3-2023q4	2010q1-2024q4	1990q1-2024q4	2010q1-2024q3

D. Application to the international bank lending data

Figure D1. Impulse responses of real GDP to international bank lending shocks



Note: This figure shows the cumulative responses of real GDP growth to a one-standard-deviation increase in international bank lending over a 12-quarter horizon. Aldasoro et al. (2023)'s code and dataset are used to estimate the impulse responses. The right panel replicates their panel (b) from Figure 14. ABGM indicates the impulse responses using the GIV approach from Aldasoro et al. (2023); HKKW represents our approach, in which international bank lending is regressed on economic forecasts to construct the IV; BOGC uses an IV constructed as in Blanchard et al. (2017); BD uses U.S. Broker Dealer leverage as IV; and AHMP uses the common component of Avdjiev et al. (2020). Shaded areas (both panels) and dashed lines (left panel) indicate 90% confidence intervals.

We apply our identification strategy to the data of international bank-lending flows from the BIS Locational Banking Statistics by Residence (LBSR) for 22 EMEs over 1990Q1–2018Q4. This is the same database employed by Aldasoro et al. (2023) (ABGM, hereafter). This exercise provides an out-of-sample test of our approach in a completely different empirical setting—with a distinct dataset and type of capital flows. Using their data, we first construct our measure of international bank lending shocks by regressing the observed lending flows on Consensus Economics forecasts. We then use this measure as an instrument in their local projection model.

The left panel in Figure D1 compares the impulse responses of real GDP growth to a one-standard-deviation increase in international bank lending, obtained using our method (HKKW), with those reported by ABGM. The responses are qualitatively similar: real GDP increases significantly in the short term following a rise in international bank lending, peaking around the third quarter after the shock, and the effect gradually diminishes, becoming statistically insignificant after six quarters. The magnitude and timing of the effects are broadly comparable across the two methods, suggesting that any potential biases generated by our approach are minimal—assuming ABGM's estimates are accurate.

In contrast, the right panel shows estimated effects using other IVs. This panel replicates Panel (b) in Figure 14 of ABGM, illustrating that IVs based on global financial conditions may produce effects that are an order of magnitude larger—or even reverse the sign of the impact. As a result, the estimated effects can be implausibly large in absolute value. ABGM interpret this as evidence of estimation bias arising from various channels through which global risk appetite affects EMEs beyond the increase in capital inflows.

The slightly smaller responses from our estimates relative to those of ABGM are consistent with the theoretical discussion. According to the framework, if the constructed residuals contain additional noise—for instance, because the forecasts used in the first-stage regression do not perfectly capture agents' true expectations—the variance ratio $\omega^2 Var(\hat{R}_t)/Var(\hat{u}_t)$ becomes smaller than one. This attenuation term biases the estimated coefficient toward zero, leading to an underestimation of the true effect. In our context, such attenuation likely arises from imperfections or measurement errors in the economic forecasts rather than from a flaw in the identification strategy itself. Hence, the fact that our results are slightly weaker in magnitude but otherwise very close to those of ABGM supports the theoretical prediction that any bias in our estimates primarily reflects the quality of expectation measures used in the first stage, rather than a failure of the methodology.

Overall, this exercise serves as another robustness check, demonstrating that our proposed identification method performs well in an entirely different empirical setting and is capable of recovering effects consistent with those obtained by a different study.

Appendix References

Aldasoro, I., Beltrán, P., Grinberg, F., and Mancini-Griffoli, T. (2023). "The macro-financial effects of international bank lending on emerging markets." *Journal of International Economics*, 142: 103733.

Avdjiev, S., Gambacorta, L., Goldberg, L., and Schiaffi, S. (2020). "The shifting drivers of global liquidity." *Journal of International Economics*, 125: 103324.

Bauer, M. and Swanson, E. (2023). "A Reassessment of Monetary Policy Surprises and High-Frequency Identification." *NBER Macroeconomics Annual* 37: 87-155.

Blanchard, O., Ostry, J.D., Ghosh, A.R., and Chamon, M. (2017). "Are capital inflows expansionary or contractionary? Theory, policy implications, and some evidence." *IMF Economic Review*, 65(3): 563–585.

Chinn, M.D. and Ito, H. (2006). "What matters for financial development? Capital controls, institutions, and interactions." *Journal of Development Economics*, 81(1): 163–192.

Fernández, A. and Vicondoa, A. (2024). "Capital flows to emerging markets: Disentangling quantities from prices." Working Paper.

Mbaye, S., Moreno-Badia, M., and Chae, K. (2018). "Global debt database: methodology and sources." IMF Working Paper WP/18/111, International Monetary Fund, Washington, DC.

Schmitt-Grohé, S. and Uribe, M. (2017). Open economy macroeconomics. Princeton University Press.

Vegh, C. (2013). Open economy macroeconomics in developing countries. MIT Press.