

Riding the Global Financial Cycle: How Capital Flows into LICs

Prepared by Alexei Miksjuk and Yipei Zhang

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Riding the Global Financial Cycle: How Capital Flows into LICs**Prepared by Alexei Miksjuk and Yipei Zhang***

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ABSTRACT: As low-income countries (LICs) gain access to international capital markets, the scope for increased financing rises but so does the risk of shocks. Our empirical results suggest that, after the global financial crisis (GFC), the global financial cycle has been a significant driver of private capital flows to LICs. In particular, a stronger US dollar (against advanced economy currencies) was associated with weaker net inflows. We also find that external government borrowing in LICs had a statistically significant but relatively small counter-cyclical component, inversely related to global financial and economic cycles, complementing policy responses to shocks.

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WORKING PAPERS

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I. Introduction

Economic literature has long recognized fluctuations in capital flows as a major source of shocks and studied their drivers, but capital flows to low-income countries (LICs) have received little attention so far.¹

While capital flows are an important source of financing, they are inherently volatile and have long been associated with shocks in emerging markets (EMs). Multiple empirical studies have identified domestic factors pulling capital into countries, as well as the global financial cycle related to risk aversion (proxied by the Chicago Board Options Exchange's Volatility Index, VIX), risk-taking (linked to US dollar movements), and global interest rates (the Fed rate) pushing gross capital flows across economies. At the same time, several papers have pointed out heterogeneity, as the impact of global factors varies substantially across countries, across sectors, and over time. Notably, only a few studies have analyzed capital flow dynamics to LICs and found very weak, if any, impact from the global financial cycle.

Post-global financial crisis (post-GFC) developments provide a new opportunity to analyze the driving forces behind capital flows to LICs. Foreign direct investment (FDI) – the dominant source of private capital flows to LICs – exhibited an increasing trend until the GFC but broadly stabilized thereafter. In addition, almost all heavily indebted poor countries (HIPC) reached the HIPC Initiative completion point and received debt relief by 2012, increasing the scope to align government loans – the dominant source of public capital flows to LICs – with macroeconomic needs. Against this backdrop, the post-GFC period may provide a structurally stable environment to study capital flows to LICs. At the same time, this period includes several major crises (COVID-19, Russia's war in Ukraine, monetary tightening), which generated large variations in global economic and financial conditions and significant fluctuations in capital flows.

In this paper, we analyze whether fluctuations in capital flows to LICs in the post-GFC period are affected by changes in global conditions. We estimate panel regressions for a large sample of 69 LICs using a standard push-pull model. Compared to earlier studies of capital flows to LICs, we consider the role of US dollar exchange rate (often linked to capital flows in EMs), focus on the post-GFC period of 2012-2024, disaggregate capital flows by sectors (government, banks, non-banks), and allow for heterogeneity across country characteristics. This leads to two main findings:

- *Post-GFC private capital flows to LICs share a statistically significant and sizable global component captured through US dollar movements against other advanced economy currencies.* We find that US dollar appreciation – often associated with lower risk-taking of global investors and weaker balance sheets of foreign borrowers – has a statistically and economically significant negative impact on net FDI and on net non-bank (trade) financing in LICs. Bank financing may also be affected by US dollar movements, but this estimate is sensitive to model specifications and insignificant for small developing states (SDS). In addition, we find that global economic cycle has a statistically significant positive effect on FDI inflow to LICs but the size of this effect is relatively small.
- *Post-GFC external government borrowing by LICs has a statistically significant counter-cyclical component, although its size is relatively small.²* The counter-cyclical effect is largely coming from multilateral financing, which is inversely related to the global economic and financial cycles.³ In particular, we find that slower

¹ In this paper, capital flows refer to the financial account of the balance of payments. They do not reflect grants or remittances.

² Although the effect of global push factors on public borrowing appears modest in percent of GDP, the estimated coefficients on the standardized regressors are comparable in magnitude to those for private capital flows. The seemingly small GDP-scaled effect reflects the smaller scale and volatility of public borrowing relative to GDP, not a weaker economic relationship.

³ Post-GFC loans from official bilateral donors are harder to analyze due to the compositional shift.

global economic growth and US dollar appreciation against advanced economy currencies are both associated with statistically significant increase in multilateral loans. This effect is stronger in frontier LICs and weaker in fragile and conflict-affected states (FCS). In addition, multilateral financing might have a counter-cyclical component related to country-specific economic conditions (inverse relationship with lagged economic growth), but this estimate is sensitive to model specifications. Government borrowing from private creditors also exhibits counter-cyclical behavior – increases in the periods of low non-fuel commodity prices, reflecting higher financing needs during negative terms-of-trade shocks (low export prices).

In this context, LICs need to strengthen capacity to monitor private capital flows, prevent buildup of imbalances, and stand ready to address economic and financial shocks supported by counter-cyclical public borrowing. While capital flows support financing in LICs, they are also a source of shocks, even if they have not yet become a major source of crises like in EMs. Macroeconomic policy response, guided by the IMF's Institutional View on the Liberalization and Management of Capital Flows and the IMF's Integrated Policy Framework (IPF), may include monetary, exchange rate, fiscal policy adjustment, structural policies, foreign exchange (FX) interventions, macroprudential and capital flow management measures. FX interventions underpinned by international reserves are likely to be an important element of this policy mix to support fixed exchange rate regimes (which prevail in LICs) or to address potential disruptions from exchange rate movements associated with destabilizing premia in shallow FX markets, financial stability risks from FX mismatches, and risks of de-anchored inflation expectations. Lending by multilateral and official bilateral donors provides important counter-cyclical support to international reserves, especially if it does not induce additional fiscal spending, but LICs need to ensure their debt sustainability.

II. Background

Literature Review on Capital Flows

Many theoretical models emphasize the importance of foreign financing for economic growth and focus on domestic drivers of capital inflows. In most of the literature, these drivers included the marginal productivity of capital arising from technology, demographics, or capital scarcity (Lucas, 1990; Obstfeld and Rogoff, 1996; Vasilyev and others, forthcoming), the depth and fragility of domestic financial systems (Caballero and others, 2008; Caballero and Krishnamurthy, 2009), as well as fiscal institutions and policy credibility that influence sovereign risks and investors' confidence (IMF, 2026). Thus, empirical literature often considered GDP growth and/or level, financial development, and macroeconomic imbalances (e.g., fiscal balance and/or debt level) as domestic "pull" factors behind capital flow movements (e.g., Forbes and Warnock, 2012, 2020; IMF, 2025, 2026).

In addition, the importance of global factors behind capital movements has long been established, usually in the context of push-pull models, and related to crises episodes.⁴ Diaz-Alejandro (1983, 1984) suggested that Latin America crises in early 1980s were driven by a combination of domestic policy weaknesses and financial shocks in advanced economies (AEs) that affected the peripheral countries. Calvo and others (1993), Fernandez-Arias (1996), and Chuhan and others (1998) established that global push factors

⁴ A related strand of the literature highlights the role of financial contagion, whereby shocks originating abroad are transmitted across countries through balance-sheet linkages and common lenders (Allen and Gale, 2000; Kaminsky and Reinhart, 2000; Forbes and Rigobon, 2002; Mendoza and others, 2009; Broner and others, 2013). We do not consider contagion effects in our analysis.

played a more important role behind large capital movements in Latin America and Asia in the 1980s and early 1990s than domestic pull factors. Calvo (1998) discussed the danger of extreme capital flow episodes and sudden stops following the Asian Financial Crises, while Reinhart and Reinhart (2009) extended the analysis to capital flow bonanzas, such as the one preceding the GFC. More recently, Forbes and Warnock (2012) showed that global push factors, especially global risk aversion captured by VIX, dominate the incidence of extreme capital flow episodes and cross-country synchronization. Rey (2015) attributed VIX to the global financial cycle, which is in part driven by monetary policy of center countries (most notably, the Fed rate).^{5,6} On the policy side, while Rey (2015) indicated that cross-border flows and leverage of global institutions transmit monetary conditions globally, even under floating exchange-rate regimes, Obstfeld and others (2019) found that these shocks can still be mitigated through flexible exchange rates regimes (or magnified under fixed exchange rates). Recent studies emphasized the relationship between US dollar movements and capital flows to EMs in the post-GFC period and linked it to risk-taking by global investors: US dollar appreciation prompts investors to constrain leverage due to weaker balance sheets of foreign borrowers and weaker dollar profits from investments abroad (Avdjiev and others, 2019; Gelos and others, 2024; Hofmann and Park, 2020).

Empirical studies originally focused on net flows but have increasingly emphasized the important role of gross flows for countries with well-developed financial systems. Early studies focused on net capital flows, such as sudden stops, as a major cause of crises (e.g., Calvo, 1998). This can be explained by small investments abroad from domestic investors and by the important role of net capital flows for the balance-of-payments shocks. However, as financial systems in EMs developed, it became increasingly important to differentiate between the behavior of domestic and foreign investors, shifting attention to the importance of gross capital flows (e.g., Milesi-Ferretti and Tille, 2010). In their empirical work for AEs and EMs, Forbes and Warnock (2012) and Rey (2015) highlighted that gross capital flows – rather than net flows – could be linked to the global financial cycle. This consideration, however, is less relevant for LICs, many of which have less developed financial systems and little investment abroad.

Heterogeneity of capital flow dynamics has been recently highlighted in several studies. Avdjiev and others (2017) showed that the strength of global factors in driving flows and currencies varied substantially across countries and sectors, and over time. They found that public sector flows may serve as a countervailing force to private sector flows in EMs, where public sector flows are counter-cyclical and respond to global shocks in the opposite direction compared to private sector flows which are procyclical.⁷ Multiple studies also established that the impact of global shocks on AEs and EMs diminished in the period after the GFC (Avdjiev and others, 2017; Forbes and Warnock, 2021), although not for all types of flows. Giordani and others (2017) confirmed the central role of global shocks while highlighting the cross-border spillover effect associated with capital controls.⁸

Despite the general interest in capital flows, few studies have analyzed capital flows to LICs and found very weak, if any, impact from the global financial cycle. This might reflect both smaller size of flows and limited data availability in many LICs until recently. Giordani and others (2017) focused on the less industrialized countries due to more prevalent capital controls; their sample includes only 19 LICs. IMF (2025) estimated a standard pull-push model for 2000-2023 data for net FDIs and for other investments but found a

⁵ Bekaert, Hoerova, and Lo Duca (2013) provide further discussion of the monetary policy impact on risk aversion and uncertainty.

⁶ The GFC has also spawned a surge in theoretical research on crises and capital flows focusing on “push” factors, including the role of risk (e.g., Bacchetta and van Wincoop, 2013) and liquidity/credit (e.g., Calvo, 2009; Bruno and Shin, 2013).

⁷ The same does not hold for advanced economies.

⁸ In their pull-push model, country capital inflow control is a statistically significant negative pull factor, whereas the rest of the world’s capital control is a positive pull factor. Evidence on the spillover effect is not robust and sensitive to model specification.

statistically insignificant coefficient on VIX in all specifications. For other investments, the impact of global interest rates was found to be statistically significant: an increase in the real US rate leads to decline of investment flows to LICs. In addition, IMF (2025, 2026) highlighted the importance of fiscal factors as a pulling force behind FDI to LICs, while broader institutional settings (governance, rule of law, capital account openness) also play a role, with weaker settings being associated with lower FDI. None of these LIC estimates analyzed the role of US dollar movements in capital flows.

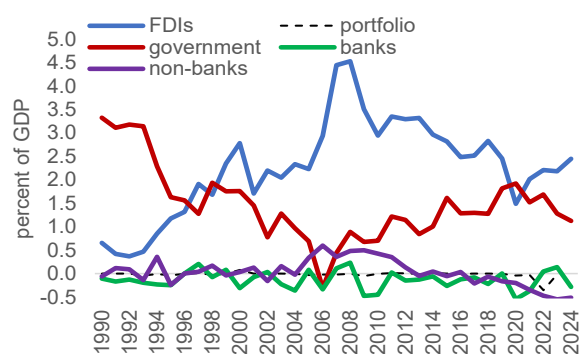
Overview of Capital Flows to Low-Income Countries

Post-GFC developments provide a new opportunity to study the driving forces behind capital flows to LICs. The period around the GFC marks change in trends for the main sources of capital flows in LICs – FDIs and government loans (Figure 1). This might reflect broader structural change in their drivers, e.g., growing trend in FDI inflows before the GFC might indicate higher financial and economic integration of LICs, increasing the role of the global push factors in the post-GFC period. At the same time, the post-GFC period already includes several crisis episodes (COVID-19 in 2020, Russia’s war in Ukraine, global inflation, and monetary tightening in 2022) with large variation in the global economic and financial conditions and fluctuations in capital flows.

FDI – the dominant source of private capital flows in LICs – increased steadily until the GFC but broadly stabilized thereafter. Median net FDI

inflow to LICs gradually increased from early 1990s to 2008, dropped in 2009, and stabilized in the range of 2-3.5 percent of GDP since 2010 (Figure 1). This break in trend is consistent with broader post-GFC developments across the world, characterized by stalling financial integration and declining trade and investment flows between geopolitically distant countries (Lane and Milesi-Ferretti, 2018; Gopinath and others, 2025). The composition of FDI sources shifted, with a post-GFC rise in the share of China, India, and Gulf countries (IMF, 2026). In addition, the recipient country composition changed, as FDI in LICs shifted from commodity exporters to exporters of more diverse goods and services (IMF, 2026).⁹ In terms of the financial instruments, net FDI inflows predominantly reflected FDI equity liabilities, i.e., foreign investments into capital, while debt operations and investments abroad were small, with some exceptions (see Annex I).

Figure 1. Median Net Financial Inflows to LICs



Source: authors' calculations based on the IMF BoP data.

Unlike in AEs and EMs, other private capital flows into and out of LICs were small and largely confined to bank activities and firms’ trade financing. Portfolio flows were negligible in most LICs (Figure 1 and Annex I). Net “other investments” flows through banks were mostly negative (with the median fluctuating between -0.5 and 0 percent of GDP in most years since the GFC), reflecting banks’ accumulation of deposits abroad for payment and other purposes that exceeded foreign loans and deposits mobilized by banks. Net “other

⁹ Recent evidence suggests that the global shift of FDI toward services has benefited larger and more competitive EMs and LICs, where higher skill levels make it easier to benefit from productivity and technology spillovers (World Bank, 2024; World Bank, 2025; UNCTAD, 2025). FDI inflows to FCS declined and remained lackluster against a backdrop of fragility and conflict, and weaker investment in commodities sectors (IMF, 2026). That said, many non-FCS SDS and several economies with large commodities sectors continued to enjoy high level of FDI as percent of GDP (remained in the upper quartile across LICs).

investments” through the non-bank sector were small (median in the range from -0.5 to +0.5 percent of GDP) and largely reflected foreign trade financing.

Government loans – the dominant source of public capital flows in LICs – recovered and broadly stabilized in the post-GFC period. Median net borrowing by governments and central banks in the form of “other investments”, which comprise loans and some other operations, was on a declining path before the GFC but increased thereafter.¹⁰ In addition, more than half of LICs had reached the HIPC Initiative completion point and received debt relief by 2012, increasing the scope to align their government loans with development and macroeconomic stabilization needs. Since 2012, the median net government borrowing stabilized and was hovering in the range of 1-2 percent of GDP. These loans to LICs come on different terms (concessional and non-concessional) and from various sources – from multilateral organizations, from official bilateral lenders, and from private creditors (IMF, 2026).

Although net and gross flows largely coincide for key capital flow sources to LICs, net flows remain analytically useful. For most LICs, foreign assets in the form of FDI or government and central bank investments (excluding international reserves) are small, reflecting small investments abroad by those countries (Annex I). Thus, net capital flows (net incurrence of liabilities minus net increase in assets) largely coincide with gross flows (net incurrence of liabilities). However, and similar to the early studies of capital flows, focusing on net rather than gross flows to LICs might provide additional analytical benefits. First, net capital flows are more closely linked to balance-of-payments shocks. Second, in the few cases when FDI assets are significant, they often appear to be correlated (and inter-related) with FDI liabilities (Annex I). Therefore, the rest of the paper is focused on modeling the evolution of net capital flows to LICs in the post-GFC period.

III. Methodology and Data

To analyze the role of global factors across different types of financial flows in LICs, we estimate a standard pull-push factor model of capital flows. Specifically, we follow the empirical literature (e.g., Forbes and Warnock, 2012; Giordani and others, 2017) to estimate a panel regression for each type of financial flows, $Kflow_{i,t}$:

$$Kflow_{i,t} = \beta_1 \times PUSH_t + \beta_2 \times PULL_{i,t-1} + \gamma_i + \varepsilon_{i,t}, \quad (1)$$

where $PUSH_t$ is a vector of “push” factors including VIX as a proxy for global risk sentiment, US dollar nominal effective exchange rate (NEER) against AEs capturing risk-taking by global investors, the Fed policy rate as a proxy for global interest rates, non-fuel commodity prices reflecting terms-of-trade shocks in LICs (many are primary commodity exporters), and global economic growth capturing external economic environment; the country-specific pull factors $PULL_{i,t-1}$ capture domestic conditions conducive to attract inflows, including real GDP growth rate, current account balance, and fiscal balance which captures policy prudence (Table 1); γ_i stand for the country fixed effects, and $\varepsilon_{i,t}$ is the error term. Since push factors are global, non-country-specific variables, they are considered exogenous to LIC capital recipient i in equation (1), so we interpret the coefficients β_1 as the impact of global financial and economic conditions (captured in push factors) on net

¹⁰ This does not include Eurobond issuance or repayment (covered under portfolio investments).

capital flows.¹¹ At the same time, while we *control for* domestic factors, we do not aim to interpret *causal* effects: all domestic pull factors are lagged by one year in equation (1), however the coefficients β_2 may reflect both, lagged impact of prudent policies (as policies can affect capital flows) and/or inertia in capital flows (as capital flows can affect current account and fiscal balances and growth, so $PULL_{t-1}$ would effectively proxy $Kflow_{t-1}$).^{12,13}

Compared to earlier studies of capital flows to LICs, we focus on the relatively structurally stable post-GFC period, disaggregate flows by sectors (government, banks, non-banks), and allow for heterogeneity across country characteristics. We estimate a wide panel regression ($N > T$) for a large sample of 69 LICs on the period of 2012-2024, for which we observe no clear structural break in trends. As discussed in the previous section, we use *net* capital flows for FDI and for other investments by banks, non-banks, and governments and central banks (excluding IMF financing), which are calculated using gross capital inflow and outflow data from the IMF Balance of Payments (BOP) database. We disaggregate government and central bank capital flows further by the source of financing – from multilateral, official bilateral, and private lenders – using the data from the World Bank International Debt Statistics (IDS) database.

The list of explanatory variables – push and pull factors – and their data sources is shown in Table 1.

All push and pull variables are standardized, with the VIX index log-transformed prior to standardization. To prevent large volatility in capital flows from unduly swinging coefficient estimates, we also standardize the dependent variables by subtracting the country-specific mean of each type of capital flow (in percent of GDP) and dividing by the corresponding country-specific standard deviation. Accordingly, to meaningfully interpret the results in terms of effects on capital flows (in percent of GDP), we scale the estimated push or pull coefficients by the median standard deviation in our LIC sample. As discussed below, we use dummy variables to account for different institutional characteristics across subgroups of LICs – SDS, FCS, frontier, and other economies.

Our empirical strategy for each type of capital flow consists of four steps. First, we estimate the full specification: include all explanatory variables (without institutional dummies) and estimate a wide panel regression using clustered robust standard errors. Second, we estimate the parsimonious specification to cross-check our results for the global financial cycle: we keep USD NEER, but otherwise use only the statistically significant pull and push factors from the first step, which helps to reduce the number of parameters to be estimated on the relatively short post-GFC period. Third, we use the parsimonious specification to test for heterogeneity among LICs and to conduct robustness checks, since the full specification has many parameters and could not be meaningfully used for that purpose. Specifically, we test for heterogeneity among LICs with various institutional characteristics by including interaction terms of country dummy variables (for SDS, FCS, frontier, and other economies) with push and pull factors. We perform robustness checks by including lagged capital flows or controlling for the COVID-19 crisis. For the latter, we considered two options to capture the crisis impact and the cyclical recovery: two yearly dummies (for 2020 and for 2021) and a single COVID dummy for both years (2020-2021). The next section presents empirical results from the first and the second steps (full and parsimonious specifications), while the full set of results is shown in Annex II.

¹¹ To avoid the endogeneity problem, we use US dollar NEER against AEs instead of US dollar NEER against all trading partners or country-specific bilateral US dollar exchange rate.

¹² To avoid the endogeneity problem, we did not include contemporaneous pull factors into equation (1).

¹³ We add lagged capital flows to equation (1) as one of our robustness checks, see Annex II.

Table 1. List of Push and Pull Factors

Factors	Variables	Source
“push”	Chicago Board Options Exchange’s Volatility Index (VIX)	CBOE ¹⁴
	US dollar nominal effective exchange rate (USD NEER)	IMF Effective Exchange Rate (EER)
	US Federal Reserve target federal funds rate (Fed rate)	IMF International Financial Statistics
	World GDP growth	IMF World Economic Outlook
	Non-fuel Commodity Price Index	IMF World Economic Outlook
“pull”	GDP growth (lagged)	IMF World Economic Outlook
	Fiscal balance (lagged)	IMF World Economic Outlook
	CA balance (lagged)	IMF World Economic Outlook

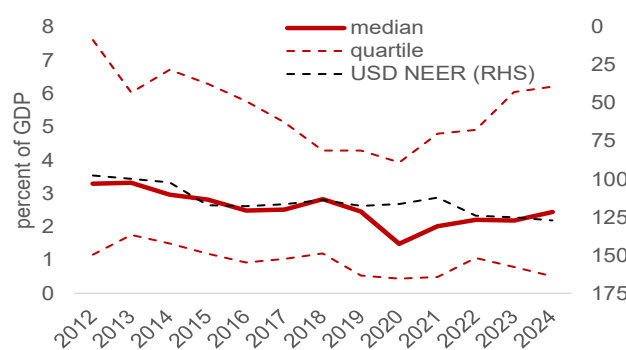
IV. Empirical Results

Private Capital Flows to LICs

We estimate separate panel regressions for the main types of net private capital flows to LICs – FDI, bank, and non-bank financing – and find the significant role of US dollar index in driving this financing. In most cases discussed below, we found that US dollar appreciation (capturing reduction in risk-taking and global financial conditions tightening) has a statistically significant negative impact on net private capital inflows to LICs. To our knowledge, our findings are the first confirmation of the significant role of the US dollar in capital flows to LICs, although they are broadly in line with the post-GFC estimates for EMs.¹⁵

For FDI, we find that US dollar appreciation against other AE currencies has a significant negative effect, both statistically and economically, on net inflows to LICs in the post-GFC period. US dollar NEER is often seen as one of the main push factors driving capital flows to EMs (Avdjiev and others, 2019; Gelos and others, 2024), and therefore, can be related to the global financial cycle. Both our full and parsimonious specification estimates confirm that US dollar appreciation had a statistically significant negative effect on net FDI inflows into LICs in 2012-2024 (Table 2; Figure 2). The effect is also economically significant: a one standard deviation appreciation in USD NEER, equivalent to 8.2 percent USD appreciation, leads to a net FDI

Figure 2. Net FDI Inflows to LICs



Source: authors' calculations based on the IMF BoP data.

¹⁴ VIX is a measure of the expected volatility of the US stock market, published by and downloaded from the Chicago Board Options Exchange (CBOE). We use the year-average VIX close reading.

¹⁵ Gelos and others (2024) found a statistically significant effect of USD NEER (against AEs) on capital flows to EMs through local currency bonds and equities but not through FX financing (bonds or loans). However, when using USD NEER (against all trading partners), they also found a statistically significant impact on FX loan flows to EMs.

inflow decline by 0.32 percent of GDP for a median LIC.¹⁶ These estimates withstand the robustness tests discussed in Annex III.

Table 2. Panel Estimates for Net Private Capital Flows to LICs

	FDI		Banks		Non-banks	
Global (push) factors:						
USD NEER	-0.18*	-0.19***	-0.12	-0.13*	-0.24**	-0.15**
	(0.093)	(0.058)	(0.086)	(0.073)	(0.091)	(0.063)
log(VIX)	-0.06		0.003		0.10	
	(0.050)		(0.065)		(0.062)	
world GDP growth	0.07*	0.12***	0.09		0.06	
	(0.042)	(0.027)	(0.059)		(0.049)	
non-fuel commodity price index	0.02		-0.11		-0.11	
	(0.078)		(0.074)		(0.086)	
Fed rate	0.02		0.20*	0.14*	0.10	
	(0.097)		(0.106)	(0.078)	(0.107)	
Country-specific (pull) factors:						
lagged CA balance	-0.15***	-0.15***	-0.14***	-0.16***	-0.15***	-0.16***
	(0.053)	(0.053)	(0.046)	(0.043)	(0.057)	(0.048)
lagged GDP growth	0.09**	0.12***	-0.04		0.03	
	(0.045)	(0.037)	(0.049)		(0.057)	
lagged fiscal balance	0.005		-0.06		-0.006	
	(0.041)		(0.051)		(0.062)	
constant	-0.03***	-0.03***	0.004	0.017**	-0.010	-0.009
	(0.009)	(0.006)	(0.009)	(0.008)	(0.010)	(0.006)

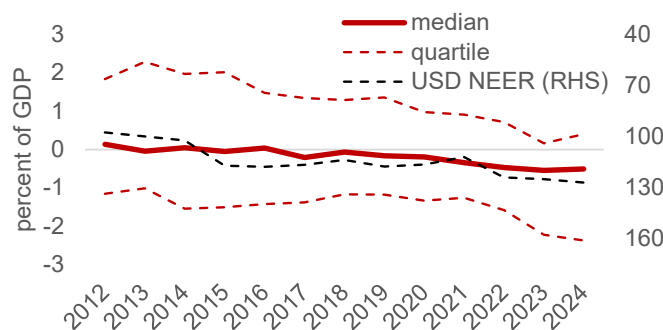
Note: The dependent variable is net capital inflow as a percentage of GDP, to which normalization has been applied. Robust standard errors clustered at country level are in parentheses. Statistical significance: *** p<0.01, ** p<0.05, * p<0.1. All specifications include country fixed effects; year fixed effects are not included.

Net FDI inflows to LICs also tend to be procyclical with respect to the global economic cycle – this effect is statistically significant but economically small. Both our full and parsimonious specification estimates show that a reduction in world GDP growth leads to a statistically significant decline in net FDI inflow to LICs (Table 2). The size of the effect is relatively modest, though: a one percentage point reduction in global growth is associated with a decline in net FDI financing of 0.07 percent of GDP for the median LIC. The results on world GDP growth also withstand the robustness checks (Annex II).

¹⁶ This is obtained by taking median standard deviation of FDI (in percent of GDP) across LICs, multiplied by the coefficient on the standardized USD NEER index in Table 2. Similarly calculations are done for the interpretation of other coefficients. The percent equivalent of 1 standard deviation appreciation is calculated using historical average USD NEER as the denominator, similarly for non-fuel CPI inflation. For world GDP, the effect from one percentage point increase in world GDP growth is derived from its one standard deviation (equivalent to 2.0 percentage points).

For non-bank financing (mostly comprised of trade financing), we also find a statistically and economically significant effect of US dollar movements in the post-GFC period. Our estimates show that US dollar appreciation had a statistically significant negative impact on non-bank net inflows to LICs in 2012-2024 (Table 2; Figure 3). The impact is also economically significant: a one standard deviation appreciation in USD NEER against other AE currencies, equivalent to 8.2 percent USD appreciation, leads to a decline in net inflows through non-banks by 0.46 percent of GDP for a median LIC. These estimates withstand a range of robustness checks (Annex II).

Figure 3. Net Non-Bank Inflows to LICs



Source: authors' calculations based on the IMF BoP data.
Notes: data shows net other investments by banks.

For bank financing, our estimates are sensitive to model specifications and do not allow for reliable estimates of capital flow drivers but highlight heterogeneity across institutional characteristics. Global financial conditions captured through USD NEER are statistically significant in the parsimonious specification but not in the full specification. Global financial conditions captured through the Fed rate are statistically significant in both specifications but have an unexpected sign (Table 2). Moreover, the US dollar and the Fed rate become insignificant under our robustness checks (Annex II). It is also worth noting that bank financing depends on institutional characteristics of LICs (Annex II). For non-SDS, the coefficient on USD NEER is statistically significant (reflecting the impact from the global financial cycle), while for SDS it is not significant as financing in those countries might have been driven by non-economic factors or situations in mother banks abroad. For example, this might partly reflect the post-GFC reduction in correspondent banking relationships by global banks – amid changes in the regulatory and enforcement environment and compliance costs with respect to more rigorous prudential requirements, AML/CFT regulations, and tax transparency – which particularly affected smaller EMs and LICs (IMF, 2024a; Erbenova and others, 2016). Similarly, for non-FCS, the coefficient on the Fed rate is not statistically significant, while for FCS the coefficient is significant and positive, which might reflect low sensitivity of FCS banks' financing to interest rates in AEs.

Public Borrowing by Low-Income Countries

We find that external public borrowing in LICs contains both procyclical and counter-cyclical elements, and further disaggregation of such borrowing is necessary to analyze its driving forces. Our estimates show that net financing by governments and central banks in the form of other investments has a statistically significantly negative relationship with the Fed rate: global financial conditions tightening through interest rate increase leads to a procyclical decline in financing (column "All Sources" in Table 3). At the same time, in the parsimonious specification, public financing exhibits a statistically significant positive relationship with USD NEER: tighter global financial conditions through US dollar appreciation leads to a counter-cyclical increase in financing. To analyze its driving forces, we disaggregate public financing by the type of lenders who might have different incentives: multilateral lenders (excluding IMF), bilateral lenders, and private lenders.

The counter-cyclical effect is driven largely by multilateral financing, which is inversely related to the global economic and financial cycles in the post-GFC period. Our estimates show that multilateral financing to LICs exhibited a statistically significant counter-cyclical relationship with global economic growth

and with global financial conditions captured through USD NEER in 2012-2024 (column

“Multilateral” in Table 3; Figure 4). Both effects are relatively small in percent of GDP: a one

percentage point reduction in global growth leads

to an increase in net multilateral inflows by 0.05

percent of GDP for a median LIC, although this

effect is weaker for FCS and stronger for frontier

LICs. Similarly, US dollar NEER appreciation by

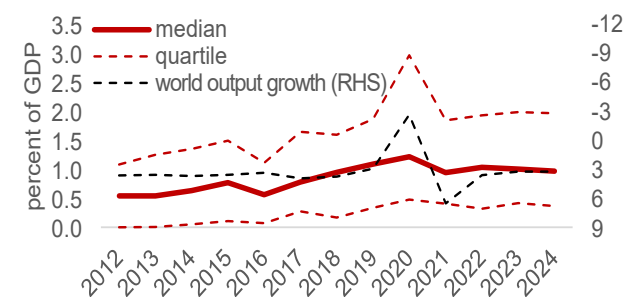
one standard deviation leads to an increase in net

multilateral inflows by 0.09 percent of GDP for a

median LIC.¹⁷ These estimates withstand our

robustness tests (Annex II). Multilateral financing also tends to be counter-cyclical to country-specific economic conditions (a reduction in lagged domestic economic growth is associated with an increase in multilateral financing), although this estimate appears sensitive to model specification.¹⁸

Figure 4. Net Borrowing from Multilateral Lenders by LICs



Source: authors' calculations based on the IMF BoP data.

Notes: data shows net other investments by central government and central banks excluding IMF financing.

Table 3. Panel Estimates for Net Public Borrowing in LICs

	All sources		Multilateral		Bilateral		Private	
Global (push) factors:								
USD NEER	0.11 (0.084)	0.13* (0.066)	0.12 (0.084)	0.15** (0.056)	0.02 (0.085)	0.04 (0.083)	-0.08 (0.106)	-0.04 (0.078)
log(VIX)	0.01 (0.051)		-0.003 (0.056)		-0.09* (0.048)	-0.09** (0.040)	0.03 (0.073)	
world GDP growth	-0.07 (0.051)		-0.13** (0.051)	-0.12*** (0.044)	-0.03 (0.042)		0.07 (0.067)	
non-fuel commodity price index	-0.01 (0.074)		-0.02 (0.071)		-0.02 (0.078)		-0.24** (0.113)	-0.17*** (0.059)
Fed rate	-0.19** (0.086)	-0.22*** (0.058)	0.04 (0.094)		-0.20*** (0.075)	-0.22*** (0.058)	0.02 (0.108)	
Country-specific (pull) factors:								
lagged CA balance	-0.08 (0.052)		-0.05 (0.048)		-0.10** (0.051)	-0.12** (0.051)	-0.10* (0.059)	-0.11** (0.052)
lagged GDP growth	0.00 (0.042)		-0.08* (0.046)	-0.06 (0.045)	0.06 (0.057)		0.02 (0.064)	
lagged fiscal balance	-0.17*** (0.051)	-0.19*** (0.049)	-0.16*** (0.045)	-0.17*** (0.045)	-0.17*** (0.048)	-0.15*** (0.046)	-0.07 (0.051)	
constant	0.005 (0.009)	0.010 (0.007)	0.010 (0.008)	0.011 (0.008)	-0.011 (0.011)	-0.011 (0.011)	0.000 (0.015)	-0.003 (0.013)

Note: The dependent variable is net capital inflow as a percentage of GDP, to which normalization has been applied. Robust standard errors clustered at country level are in parentheses. Statistical significance: *** p<0.01, ** p<0.05, * p<0.1. All specifications include country fixed effects; year fixed effects are not included.

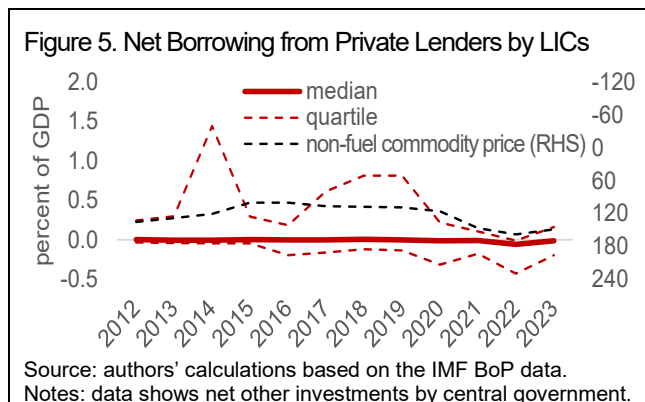
¹⁷ This effect is statistically significant for the parsimonious specification, but insignificant for the full specification.

¹⁸ Moreover, countries with weaker fiscal positions tend to attract more public borrowing from multilateral and bilateral sources.

In the period under consideration, government financing from official bilateral donors declined amid rising global interest rates, but this general tendency masks shifting donor composition and the recent reduction in official donor assistance (ODA). Our estimates show that net inflows from official bilateral donors tend to be negatively associated with the Fed rate increase and with global risk sentiment captured through VIX (the latter is sensitive to model specifications, Annex II). However, this relationship masks diverging trends in donor financing observed in the period under consideration. For example, net financing from China to LICs has been increasing until 2014 and declining thereafter, reaching negative levels in 2023-2024 (IMF, 2026). At the same time, Paris Club bilateral financing to LICs has increased and partly offset the decline in China's lending between 2015 and 2021 but has subsequently moderated, including due to ODA revisions.

Government borrowing from private creditors also exhibits counter-cyclical behavior, increasing during periods of low non-fuel commodity prices. Our estimates in Table 3 show a

statistically significant negative effect, reflecting higher borrowing in periods of low non-fuel commodity prices (terms-of-trade shock), likely capturing weaker performance in commodity exports and government revenues. In particular, a one standard deviation reduction in non-fuel commodity prices (equivalent to 16.9 percent non-fuel commodity price deflation) increases borrowing by 0.15 percent of GDP for a median LIC.



V. Conclusions

The global financial cycle might be a significant driver of private capital net inflows to LICs. Our baseline estimates show that US dollar appreciation against other AEs' currencies – reflecting lower risk-taking and tighter global financial conditions – had a statistically and economically significant negative effect on net inflows to LICs in recent years, primarily through FDI and non-bank financing. This suggests that capital flows to LICs share a common component (captured in USD NEER) with capital flows to EMs, reflecting exposure to the global financial cycle. Our baseline estimates also show that a slowdown in world GDP growth might negatively affect FDI, although this estimate is sensitive to model specifications.

As such, private capital flows present not only a source of financing but also a source of shocks to LIC economies. For example, a one standard deviation appreciation of US dollar NEER, equivalent to 8.2 percent USD appreciation, would lead to about 0.8 percent of GDP reduction in net private inflows for a median LIC, although the total impact on the balance of payments might be lower in case of import reduction linked to FDI.¹⁹ This is lower than the effect of a typical oil price shock but comparable to the effect of other current account shocks (see Figure 16 in IMF, 2024b). This capital flow shock would likely put pressure on LICs' foreign exchange markets, tighten domestic financing conditions, and reduce investments amid lower resource availability.

¹⁹ The sum of impacts on FDI and on non-banks.

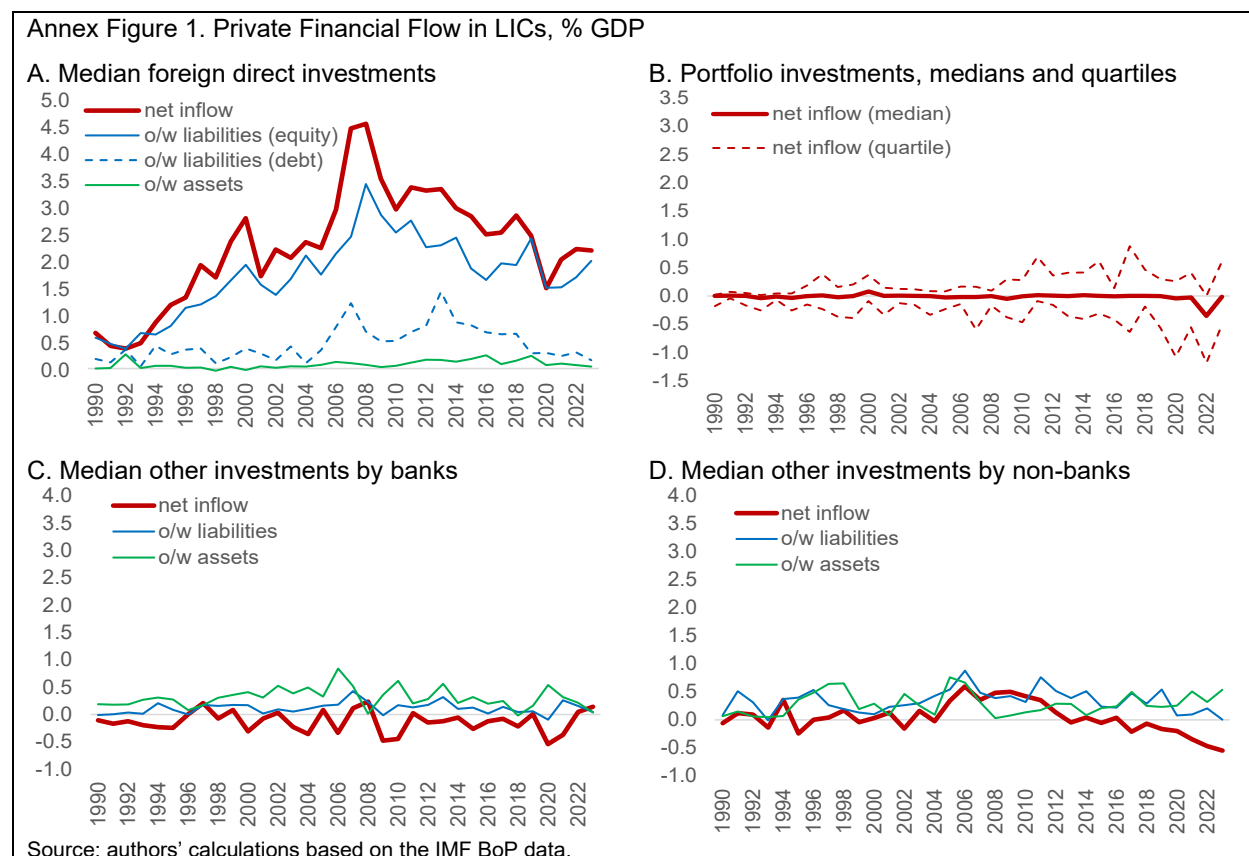
These results suggest that LICs need to strengthen capacity to monitor private capital flows, prevent buildup of imbalances, and stand ready for policy response to address shocks. Macroeconomic policy recommendations should be guided by the IMF's Institutional View on the Liberalization and Management of Capital Flows and the IMF's Integrated Policy Framework (IPF), as it for AEs and EMs. The policy mix may include monetary, exchange rate, fiscal policy adjustment, structural policies, FX interventions, macroprudential and capital flow management measures, depending on imbalances, vulnerabilities, and risks. However, FX interventions underpinned by international reserves are likely to be an important element of the policy mix in LICs to support fixed exchange rate regimes (which prevail in these countries) or to address potential disruptions from exchange rate movements associated with destabilizing premia in shallow FX markets, financial stability risks from FX mismatches, and risks of de-anchored inflation expectations.

Counter-cyclical external government borrowing by LICs provides some support to FX reserves, helping to address external shocks, especially if it does not induce additional spending. IMF financing is the only external element of the Global Financial Safety Net widely available to most LICs to address balance of payments needs (Iancu and others, 2021), but it needs to remain catalytic and complemented by other sources of financing. Given limited market access, international support is particularly important for many LICs. Our estimates confirm that financing from multilateral organizations had a statistically significant (but relatively small) counter-cyclical component vis-à-vis global economic and financial conditions in recent years. In addition, multilateral financing might have a counter-cyclical component related to country-specific economic conditions. Such counter-cyclical financing – through multilateral or official bilateral donors – present an important element of crisis response by LICs, boosting reserves and helping to address external shocks. This is particularly the case when external financing replaces domestic financing without increase in fiscal deficit. In case of deficit increase – due to financing for new projects or budget support for fiscal stimulus – the effect on FX reserves might be significantly smaller due to the import content of such spending. In addition, LICs need to ensure debt sustainability, as increase in borrowing should take place when fiscal space allows and offset through tighter fiscal policy in “good times”. Going forward, as official development assistance envelopes are projected to decline and tilt toward project- and loan-based financing (IMF, 2026), LICs might need to put an additional premium on increasing their FX reserves.

Annex I. Composition of Private Capital Flows to Low-Income Countries

In LICs, net FDI flows predominantly reflect FDI equity liabilities, i.e. foreign investments into capital. In most of these countries, FDI equity liability flows significantly exceed FDI debt liability flows, whereas FDI assets remain close to zero (Figure AI.A). In few cases where FDI assets are sizable, they often appear to be strongly correlated with FDI liabilities, pointing to the interrelated nature of these operations (likely, reflecting operations between parent companies and subsidiaries).²⁰

Other net private capital flows to LICs are small, often reflect both liabilities and assets. In most cases, portfolio flows and other investments do not exceed 0.5 percent of GDP (Figure AI.B-D). Assets dominate liabilities in bank flows but the two appear to be inter-related.²¹ Non-bank asset and liability flows (mostly trade financing) are similar in size and uncorrelated.



²⁰ Median correlation between FDI asset and liability flows in 2012-2023 was 0.43 for countries with significant FDI asset accumulation (exceeding 0.7 percent of GDP on average per year). FDI asset flows are often larger in commodity exporters, such as Republic of Congo, Mozambique, or Papua New Guinea.

²¹ Median correlation between bank asset and liability flows in 2012-2023 was 0.23.

Annex II. Model Estimates under Different Specifications

The procyclicality of private financial flows is largely robust to an alternative specification that includes the lagged dependent variable using the Arellano–Bond dynamic panel-data estimator. These include the effect of USD NEER and world GDP growth on FDI and non-bank flows. However, the estimate of USD NEER effect on bank flows becomes statistically insignificant. Most country-specific factors become statistically insignificant in columns (2), (4), and (6) and are therefore omitted from Annex Table 1.

Annex Table 1. Estimates for net private flows in LICs, controlling for lagged capital flows

	FDIs		Banks		Other sectors	
	(1)	(2)	(3)	(4)	(5)	(6)
lag		0.36*** (.054)		0.09** (.040)		0.29*** (.050)
USD NEER	-0.19*** (0.058)	-0.10* (.054)	-0.13* (0.073)	-0.10 (.095)	-0.15** (0.063)	-0.21*** (0.077)
Fed rate			0.14* (0.078)	0.21** (0.084)		
world GDP growth	0.12*** (0.027)	0.12*** (.039)				
pull factors & intercept	...	...	...	...	...	...

Notes: The dependent variable is net capital inflow as a percentage of GDP. All specifications include country fixed effects; year fixed effects are not included. Robust standard errors clustered at country level are in parentheses. *** p<0.01, ** p<0.05, * p<0.1

On public financial flows, our main results remain robust to an alternative specification that includes the lagged variable of capital flows using the Arellano–Bond dynamic panel-data estimation. These include the impact of USD NEER, world GDP growth, Fed policy rate, and non-fuel commodity price index. However, the estimated coefficient on VIX for bilateral flows becomes statistically insignificant. Most country-specific factors become statistically insignificant in column (2), (4), (6), and (8), and are suppressed in Annex Table 2.

Annex Table 2. Estimates for net public borrowing in LICs, controlling for lagged capital flows

	All sources		Multilateral		Bilateral		Private	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Lag		0.29*** (.062)		0.32*** (.053)		0.37*** (0.050)		.15** (.069)
log(VIX)					-0.09** (0.040)	-0.079 (0.055)		
USD NEER	0.13* (0.066)	0.20** (0.079)	0.15** (0.056)	0.24*** (0.061)	0.04 (0.083)	0.050 (0.10)	-0.04 (0.078)	-0.19* (0.097)
world GDP growth			-0.12*** (0.044)	-0.10** (.046)				
Fed rate	-0.22*** (0.058)	-0.12** (.060)			-0.22*** (0.058)	-0.14** (0.055)		
non-fuel commodity prices							-0.17*** (0.059)	-0.14** (.069)
pull factors & intercept	...	...	...	...	...	...	...	...

Notes: The dependent variable is net capital inflow as a percentage of GDP. All specifications include country fixed effects; year fixed effects are not included. Robust standard errors clustered at country level are in parentheses. *** p<0.01, ** p<0.05, * p<0.1

The procyclicality of private financial flows is also largely robust to alternative specifications that control for the COVID-19 crisis. We try both specifications as one COVID dummy for 2020-2021 or as two yearly dummies for 2020 and for 2021. The effect of USD on FDIs and on other sectors remains statistically significant under all specifications but becomes insignificant for banks (Annex Table 3a & 3b). The effect of the world GDP growth on FDIs remains statistically significant under the one-dummy specification (Annex Table 3a). While this effect becomes statistically insignificant under the two-dummy specification due to increased standard error estimates (reflecting low GDP growth variation outside 2020-21), so does each of the dummies (Annex Table 3b).

Annex Table 3a. Estimates for net private flows in LICs, controlling for one COVID dummy

	FDIs		Banks		Other sectors	
	(1)	(2)	(3)	(4)	(5)	(6)
covid20_21		-0.24* (0.14)		-0.22 (0.14)		-0.01 (0.12)
USD NEER	-0.19*** (0.058)	-0.20*** (.061)	-0.13* (0.073)	-0.09 (.078)	-0.15** (0.063)	-0.15** (0.064)
Fed rate			0.14* (0.078)	0.08 (0.088)		
world GDP growth	0.12*** (0.027)	0.079** (.033)				
pull factors & intercept	...	...	...	...	...	...

Notes: The dependent variable is net capital inflow as a percentage of GDP. All specifications include country fixed effects; year fixed effects are not included. Robust standard errors clustered at country level are in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Annex Table 3b. Estimates for net private flows in LICs, controlling for two dummies for 2020 and 2021

	FDIs		Banks		Other sectors	
	(1)	(2)	(3)	(4)	(5)	(6)
covid20		-0.31 (0.91)		-0.40** (0.17)		-0.02 (0.13)
covid21		-0.20 (0.47)		-0.06 (0.17)		-0.00 (0.15)
USD NEER	-0.19*** (0.058)	-0.20*** (.062)	-0.13* (0.073)	-0.061 (.079)	-0.15** (0.063)	-0.15** (0.064)
Fed rate			0.14* (0.078)	0.064 (0.089)		
world GDP growth	0.12*** (0.027)	0.056 (.29)				
pull factors & intercept	...	...	...	...	...	...

Notes: The dependent variable is net capital inflow as a percentage of GDP. All specifications include country fixed effects; year fixed effects are not included. Robust standard errors clustered at country level are in parentheses. *** p<0.01, ** p<0.05, * p<0.1

On public financial flows, our main results remain robust to an alternative specification that controls for the COVID-19. These include the impact of USD NEER and world GDP growth on multilateral financing and of non-fuel commodity prices on public financing from private sources (Annex Tables 4a). When including two yearly dummies for 2020 and for 2021 for multilateral financing, the coefficients on world GDP growth turned statistically insignificant due to higher standard error estimates (reflecting low GDP growth variation outside 2020-21) – yet the point estimate of the coefficient nearly doubled while the dummies themselves are statistically insignificant (Annex Table 4b). The estimated coefficient on VIX for bilateral flows becomes statistically insignificant in the alternative model specifications.

Annex Table 4a. Estimates for net public borrowing in LICs, controlling for one COVID dummy

	All sources		Multilateral		Bilateral		Private	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
covid20_21		0.099 (0.13)		0.11 (0.15)		-0.39** (0.16)		0.10 (0.15)
log(VIX)					-0.09** (0.040)	0.00 (0.040)		
USD NEER	0.13* (0.066)	0.11 (0.069)	0.15** (0.056)	0.15** (0.059)	0.04 (0.083)	0.069 (0.083)	-0.04 (0.078)	-0.034 (0.083)
world GDP growth			-0.12*** (0.044)	-0.10** (.049)				
Fed rate	-0.22*** (0.058)	-0.19** (.078)			-0.22*** (0.058)	-0.31*** (0.079)		
non-fuel commodity prices							-0.17*** (0.059)	-0.18*** (.059)
pull factors & intercept			...	...	...	...	...	...

Notes: The dependent variable is net capital inflow as a percentage of GDP. All specifications include country fixed effects; year fixed effects are not included. Robust standard errors clustered at country level are in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Annex Table 4b. Estimates for net public borrowing in LICs, controlling for two dummies for 2020 and 2021

	All sources		Multilateral		Bilateral		Private	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
covid20		0.28 (0.17)		0.29 (0.82)		-0.24 (.19)		-0.078 (0.17)
covid21		-0.078 (0.17)		0.31 (0.46)		-0.45** (0.18)		0.29 (0.19)
log(VIX)					-0.09** (0.040)	-0.023 (0.047)		
USD NEER	0.13* (0.066)	0.079 (0.070)	0.15** (0.056)	0.15** (0.057)	0.04 (0.083)	0.058 (0.084)	-0.04 (0.078)	-0.01 (0.086)
world GDP growth			-0.12*** (0.044)	-0.23 (.26)				
Fed rate	-0.22*** (0.058)	-0.17** (.077)			-0.22*** (0.058)	-0.29*** (0.079)		
non-fuel commodity prices							-0.17*** (0.059)	-0.21*** (.070)
pull factors & intercept			...	...	...	...	...	...

Notes: The dependent variable is net capital inflow as a percentage of GDP. All specifications include country fixed effects; year fixed effects are not included. Robust standard errors clustered at country level are in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Annex III. Other Robustness Checks and Tests

We compared the full specification against more parsimonious alternatives using AIC and BIC. For private capital flows, both information criteria favor the full specification, indicating that the included regressors contribute meaningfully to model fit even after penalizing for complexity. For public borrowing (all sources and multilaterals), AIC favors the full specification while BIC favors the parsimonious alternative, suggesting that the additional regressors provide modest predictive gains but are not essential for model identification. Given the structural nature of our analysis, we follow BIC's guidance and present the parsimonious specification along with the full specification. Our main results remain qualitatively unchanged across both specifications.

Below are AIC and BIC test results for all types of capital flows:

- FDI

Variable	full	parsimon~s
z_lviX	-.05752173	
z_NFCPI	.01578809	
z_GDP_W	.07393392	.1200039
z_IR_FED	.02090555	
z_NEER_US_AE	-.18000422	-.18910405
z_fiscal L1.	.00463668	
z_CA L1.	-.14525144	-.14513625
z_ggdp L1.	.0934898	.12366501
_cons	-.02779876	-.02888238
aic	1674.6365	1789.0617
bic	1710.44	1807.2488

- Bank

Variable	full	parsimon~s
z_lviX	.00347727	
z_NFCPI	-.10870645	
z_GDP_W	.08790821	
z_IR_FED	.1963537	.14117864
z_NEER_US_AE	-.12374676	-.12791684
z_fiscal L1.	-.06215146	
z_CA L1.	-.13550043	-.16115203
z_ggdp L1.	-.03719632	
_cons	.00425386	.01663553
aic	1704.3387	1840.138
bic	1739.879	1853.6954

- Non-banks

Variable	full	parsimon~s
z_lviX	.09707921	
z_NFCPI	-.1099417	
z_GDP_W	.06190925	
z_IR_FED	.09538827	
z_NEER_US_AE	-.24143936	-.14948785
z_fiscal L1.	-.00589036	
z_CA L1.	-.15244872	-.15599918
z_ggdp L1.	.03049285	
_cons	-.01018736	-.00920595
aic	1596.5966	1729.7748
bic	1631.7854	1738.7318

- Public borrowing (all sources)

Variable	full	parsimon~s
z_lviX	.01174435	
z_NFCPI	-.00586895	
z_GDP_W	-.07147627	
z_IR_FED	-.19088349	-.21746377
z_NEER_US_AE	.10814783	.12558283
z_fiscal L1.	-.17299646	-.19450064
z_CA L1.	-.08241107	
z_ggdp L1.	.00194072	
_cons	.00476554	.00990165
aic	1701.3062	1711.1853
bic	1737.0354	1724.6024

- Public borrowing (multilaterals)

Variable	full	parsimon~s
z_lviX	-.00290006	
z_NFCPI	-.02143528	
z_GDP_W	-.12944713	-.1226474
z_IR_FED	.04220981	
z_NEER_US_AE	.12147153	.14635153
z_fiscal L1.	-.15645297	-.16853666
z_CA L1.	-.05029362	
z_ggdp L1.	-.07900651	-.06077467
_cons	.00994437	.01145282
aic	1854.9295	1857.6901
bic	1891.2808	1875.8887

- Public borrowing (private)

Variable	full	parsimon~s
z_lviX	.03009249	
z_NFCPI	-.2443105	-.17059002
z_GDP_W	.07307722	
z_IR_FED	.02128633	
z_NEER_US_AE	-.07675817	-.04332618
z_fiscal L1.	-.07455999	
z_CA L1.	-.10168857	-.11244347
z_ggdp L1.	.02087108	
_cons	.00025767	-.00289009
aic	1096.4594	1166.8583
bic	1128.4905	1179.0774

We conducted Fisher-type panel unit root tests on all main variables, both dependent and explanatory, and confirm that the variables are stationary in levels. Most of our variables are expressed as ratios to GDP, which removes common scale trends and produces bounded, mean-reverting series. GDP growth, by construction, is the first difference of log GDP and is therefore stationary.

Type	Variable	Inv. Chi-sq	p-value	Inv. Normal (Z)	p-value	Mod. Inv. Chi-sq	p-value	N
K flow	bfd	303.90***	[0.000]	-5.37***	[0.000]	11.21	[0.000]	64
	bfbanks	421.76***	[0.000]	-9.77***	[0.000]	18.91	[0.000]	64
	bfofirms	362.67***	[0.000]	-7.78***	[0.000]	15.93	[0.000]	64
	bfoggbximf	315.96***	[0.000]	-3.91***	[0.000]	11.97	[0.000]	65
	bfogg_mlat_ximf	180.88***	[0.001]	-2.81***	[0.002]	3.46	[0.000]	63
	bfogg_prvt	204.76***	[0.000]	-3.63***	[0.000]	8.80	[0.000]	50
Push	IVIX	72.04	[1.000]	1.96	[0.975]	-3.97	[1.000]	69
	NEER_US_AE	112.49	[0.945]	-1.20	[0.115]	-1.54	[0.938]	69
	NFCPI	40.79	[1.000]	5.45	[1.000]	-5.85	[1.000]	69
	GGDP_W	475.82***	[0.000]	-15.41***	[0.000]	20.33	[0.000]	69
Pull	IR_FED	162.98*	[0.072]	-4.19***	[0.000]	1.50	[0.066]	69
	CA	376.15***	[0.000]	-6.81***	[0.000]	14.56	[0.000]	68
	fiscal	205.05***	[0.000]	-3.14***	[0.001]	4.98	[0.000]	63
	ggdp	364.94***	[0.000]	-9.11***	[0.000]	13.88	[0.000]	68

Notes: Fisher-type ADF with 1 lag; *p<0.10, **p<0.05, ***p<0.01.

For the global variable log VIX, the USD NEER, and non-fuel CPI, we conduct additional analysis. The ADF test fails to reject the null hypothesis of unit root, which we attribute to the low power of the test in our short time series (T = 13). A KPSS test, which uses the null hypothesis of stationarity, fails to reject the hypothesis at all conventional significance levels through lag orders 0–4. This is consistent with the mean-reverting properties of VIX and its widespread use in levels in the capital flows literature (e.g., Forbes and Warnock, 2012). Combined with the wide-panel structure of our data (N > T), these results provide strong reassurance against spurious regression.

Augmented Dickey-Fuller test for unit root					Augmented Dickey-Fuller test for unit root					Augmented Dickey-Fuller test for unit root				
Variable: IVIX					Variable: NEER_US_AE					Variable: NFCPI				
Number of obs = 11 Number of lags = 1					Number of obs = 11 Number of lags = 1					Number of obs = 11 Number of lags = 1				
H0: Random walk without drift, d = 0					H0: Random walk without drift, d = 0					H0: Random walk without drift, d = 0				
Test statistic		Dickey-Fuller critical value			Test statistic		Dickey-Fuller critical value			Test statistic		Dickey-Fuller critical value		
		1%	5%	10%			1%	5%	10%			1%	5%	10%
Z(t)	-1.377	-3.750	-3.000	-2.630	Z(t)	-1.678	-3.750	-3.000	-2.630	Z(t)	-1.025	-3.750	-3.000	-2.630
MacKinnon approximate p-value for Z(t) = 0.5933 .					MacKinnon approximate p-value for Z(t) = 0.4426 .					MacKinnon approximate p-value for Z(t) = 0.7441 .				
--- KPSS ---					--- KPSS ---					--- KPSS ---				
KPSS test for IVIX					KPSS test for NEER_US_AE					KPSS test for NFCPI				
Maxlag = 7 chosen by Schwert criterion Autocovariances weighted by Bartlett kernel					Maxlag = 7 chosen by Schwert criterion Autocovariances weighted by Bartlett kernel					Maxlag = 7 chosen by Schwert criterion Autocovariances weighted by Bartlett kernel				
Critical values for H0: IVIX is trend stationary					Critical values for H0: NEER_US_AE is trend stationary					Critical values for H0: NFCPI is trend stationary				
10%: 0.119 5% : 0.146 2.5%: 0.176 1% : 0.216					10%: 0.119 5% : 0.146 2.5%: 0.176 1% : 0.216					10%: 0.119 5% : 0.146 2.5%: 0.176 1% : 0.216				
Lag order	Test statistic				Lag order	Test statistic				Lag order	Test statistic			
0	.0903				0	.138				0	.282			
1	.091				1	.103				1	.172			
2	.0857				2	.0988				2	.142			
3	.104				3	.109				3	.135			
4	.133				4	.13				4	.14			
5	.186				5	.17				5	.155			
6	.256				6	.24				6	.183			
7	.328				7	.309				7	.229			

Annex IV. Country List and Sample Periods

country	sample period	country	sample period
Afghanistan	2012–2024	Mali	2012–2024
Bangladesh	2012–2024	Marshall Islands	2012–2024
Benin	2012–2024	Mauritania	2012–2024
Bhutan	2012–2024	Micronesia	2012–2024
Burkina Faso	2012–2024	Moldova	2012–2024
Burundi	2012–2024	Mozambique	2012–2024
Cabo Verde	2012–2024	Myanmar	2012–2024
Cambodia	2012–2024	Nepal	2012–2024
Cameroon	2012–2024	Nicaragua	2012–2024
Central African Republic	2012–2024	Niger	2012–2024
Chad	2012–2024	Papua New Guinea	2012–2024
Comoros	2012–2024	Rwanda	2012–2024
Congo, Democratic Republic of the	2012–2024	Samoa	2012–2024
Congo, Republic of	2012–2024	Senegal	2012–2024
Côte d'Ivoire	2012–2024	Sierra Leone	2012–2024
Djibouti	2012–2024	Solomon Islands	2012–2024
Dominica	2012–2024	Somalia	2012–2024
Eritrea	2012–2024	South Sudan	2012–2024
Ethiopia	2012–2024	St. Lucia	2012–2024
Gambia, The	2012–2024	St. Vincent and the Grenadines	2012–2024
Ghana	2012–2024	Sudan	2012–2024
Grenada	2012–2024	São Tomé and Príncipe	2012–2024
Guinea	2012–2024	Tajikistan	2012–2024
Guinea-Bissau	2012–2024	Tanzania	2012–2024
Haiti	2012–2024	Timor-Leste	2012–2024
Honduras	2012–2024	Togo	2012–2024
Kenya	2012–2024	Tonga	2012–2024
Kiribati	2012–2024	Tuvalu	2012–2024
Kyrgyz Republic	2012–2024	Uganda	2012–2024
Lao P.D.R.	2012–2024	Uzbekistan	2012–2024
Lesotho	2012–2024	Vanuatu	2012–2024
Liberia	2012–2024	Yemen	2012–2024
Madagascar	2012–2024	Zambia	2012–2024
Malawi	2012–2024	Zimbabwe	2012–2024
Maldives	2012–2024		

Notes: The list of countries and sample periods reflect data availability, which varies across variables. The reported sample period of 2012–2024 corresponds to the variable with the longest available coverage.

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