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Global Banks’ Leverage and Global Liquidity

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Global banks' leverage and global liquidity

Iván Weigandi

Abstract

This paper studies the role of global banks as a source of shocks to global liquidity. Shifts in global liquidity can drive cross-border flows, asset prices, and exchange rates, with implications for financial stability. While the existing literature emphasizes global banks as amplifiers of global shocks, I provide causal evidence that idiosyncratic leverage shocks to these institutions loosen global liquidity conditions. The analysis exploits the high concentration of global banking to construct a Granular Instrumental Variable from the size-weighted sum of bank-level idiosyncratic leverage shocks. These shocks are estimated using Instrumented Principal Component Analysis, using observable bank characteristics (e.g., size, profitability, liquidity, and risk metrics) as instruments to account for bank-specific and time-varying exposures to common global factors. Using the instrument and panel local projections, I estimate the dynamic causal effects of these banks' leverage shocks on key global liquidity measures for an unbalanced panel of 74 advanced and emerging market economies from 2000Q1 to 2022Q4. Positive shocks to global banks' leverage significantly appreciate exchange rates against the dollar, reduce US dollar-denominated bond spreads, and increase gross cross-border inflows. Significant effects on total cross-border flows indicate broader spillovers across asset markets. These findings underscore the systemic relevance of G-SIBs in driving global financial conditions and support macro-financial models where financial intermediaries' leverage is a key state variable influencing risk-taking and asset prices. By showing that global banks can originate, rather than merely transmit, global shocks, this paper adds to the literature on the global financial cycle and the international transmission of financial conditions.

Keywords: Global Banks, Capital Flows, Exchange rates, Emerging Market Bond Index, Granular Instrumental Variables, Instrumented Principal Component Analysis, Local Projections.

1 Introduction

Global banks play a crucial role in shaping global liquidity conditions, influencing cross-border financial flows, exchange rates, and funding costs in international money markets (Bruno and Shin, 2015b). Global liquidity, defined as the ease of financing across international markets, is central to financial stability because it affects asset prices, foreign credit conditions, and the global transmission of monetary policy (Cohen et al., 2017). The relationship between global liquidity and global banks is well-documented. Research highlights how their leverage can propagate financial shocks worldwide, with disruptions in the balance sheets of these institutions having far-reaching effects on countries' financial conditions (Cetorelli and Goldberg, 2011; Devereux and Yetman, 2010; Kalemli-Özcan et al., 2013). Both policymakers and academics have increasingly emphasized the importance of understanding these mechanisms, particularly as global banks play a critical role in the international financial system. However, the literature has largely focused on global banks as amplifiers of external shocks, particularly those originating in monetary policy, rather than as independent sources of global liquidity fluctuations.

This paper provides new causal evidence that exogenous shocks to the leverage of global banks drive global liquidity, using a novel identification strategy. The importance of this and other global factors in shaping cross-border financial conditions has been emphasized in a large literature (Calvo et al., 1993, 1996; Kaminsky, 2019; Engel and Wu, 2024). Framed in terms of the global financial cycle, more recent studies document strong co-movement in asset prices, capital flows, and credit growth across countries (Rey, 2015; Miranda-Agrippino and Rey, 2022; Scheubel et al., 2025). This cycle is primarily driven by US monetary policy, global uncertainty, and the leverage of global banks (Kaminsky, 2019). Conceptually, "shifts in risk appetite or liquidity preference and the associated changes in leverage can generate global liquidity cycles, amplifying both liquidity surges and shortages" (Cohen et al., 2017, p. 589). Different models have explored how shocks to financial institutions' risk aversion and value-at-risk parameters can explain fluctuations in exchange rates, cross-border flows, and risk premia (Gabaix and Maggiori, 2015; Itskhoki and Mukhin, 2021; Bruno and Shin, 2015b; Oskolkov, 2024). In these models, higher leverage is associated with greater risk-taking by global banks: they take positions previously considered too risky, charge lower risk premia, increase asset demand, expand credit flows, raise asset prices, and improve the funding conditions of other investors. However, while many studies have established causal effects of monetary policy shocks, global banks' leverage has mainly been examined as a transmission channel, particularly as a key determinant of the strength of the risk-taking channel of monetary policy (Avdjiev and Serena, 2025; Lee et al., 2022; Avdjiev et al., 2018; Dell'Ariccia et al., 2014)[1]. To fill this gap, this paper contributes to this growing literature by providing novel causal evidence of global banks' leverage as a source of exogenous shocks to global liquidity conditions.

To this end, I construct an instrumental variable for the aggregate leverage of global banks, using bank-level data and the high concentration within the global banking sector, following the granular instrumental variable approach of Gabaix and Koijen (2024). I find that positive shocks to global banks' leverage significantly appreciate exchange rates against the dollar, reduce US dollar-denominated bond spreads, and increase gross cross-border inflows. I then use the bank-level and country-level structure of the data to examine whether these effects differ across global banks, recipient economies, and periods.

Global liquidity cannot be measured directly, but its footprints can be traced through proxy measures (Cohen et al., 2017). Following previous literature (Bruno and Shin, 2015a,b; Morelli et al., 2022; Banti et al., 2012), I use exchange rates, US dollar government bond spreads, and gross cross-border inflows at the country level for 74 advanced and emerging market economies between 2000Q1 and 2022Q4. Larger gross cross-border flows, appreciating exchange rates against the US dollar, and compressed US dollar spreads signal easier cross-border financial conditions and an expansion of global liquidity. By using country-level variables instead of aggregate measures, I show that the results are not driven by advanced economies with large exposures to cross-border flows. In turn, while heterogeneous, the effects are economically significant for both advanced and emerging economies. To measure global banks' leverage, I use bank-level data for 34 institutions classified as Global Systemically Important Banks (G-SIBs) by the Basel Committee on Banking Supervision (BCBS) between 2013 and 2023. These institutions' global systemic relevance is determined by their size, interconnectedness, and cross-jurisdictional activity, among other factors (Laeven et al., 2016; McLemore et al., 2022; Egger et al., 2023). They comprise the lion's share of the global banking system. While some authors have relied on aggregated measures of leverage (Bruno and Shin, 2015b; Cesa-Bianchi et al., 2018; Cerutti et al., 2017), using bank-level data highlights the systemic relevance of individual institutions in driving global shocks and enables the identification strategy to exploit idiosyncratic shocks to these institutions[2].

The key challenge when studying the effect of global banks' leverage on global liquidity is endogeneity. Fluctuations in exchange rates and asset prices can have valuation effects on global banks' portfolios (Pedrono, 2022). Similarly, during periods of higher credit demand, banks expand both assets and liabilities, as well as their loan loss provisions

[1] More generally, there is an extensive literature exploring the role of global banks in the transmission of international shocks (Adams-Kane et al., 2015; Cetorelli and Goldberg, 2011, 2012)

[2] For Gabaix (2011), granular shocks are idiosyncratic firm-level shocks, such as innovations, budget decisions, financial problems, or strikes, that affect macroeconomic outcomes.

(Kohler, 2022; Fontaine et al., 2025; Huizinga and Laeven, 2019). Both factors can affect leverage ratios. In turn, changes in global liquidity can affect global banks' risk perceptions and appetite, changing their desired leverage (Bruno and Shin, 2015b; Cohen et al., 2017). Finally, global banks' leverage may be correlated with other confounding factors associated with global financial and economic conditions, including cross-border flows, exchange rates, and asset prices (Mandalinci and Mumtaz, 2019; Koepke, 2019; Engel and Wu, 2024). For instance, changes in US monetary policy can drive the correlation between global liquidity and global banks' leverage (Miranda-Agrippino and Rey, 2020)[3]. Because of this, measures of global banks' leverage correlated with other confounding factors can deliver biased estimates of their effects on global liquidity.

To address this bias, my empirical strategy consists of three steps. First, to identify exogenous variation in book leverage (ratio of assets over book equity), I estimate idiosyncratic shocks to global banks' leverage, isolating them from the common factors that affect all global banks, both observable and unobservable. These idiosyncratic shocks can be associated with changes in bank-level risk attitudes (Coimbra and Rey, 2024; Oskolkov, 2025). Along these lines, Barbiero et al. (2024) note that banks typically adjust their risk limits due to routine VaR methodology or recalibration updates, top-down business and strategic shifts, bank-specific regulatory compliance, or in response to bank-specific scandals or risk realization that push for a reassessment of risk models[4]

While most papers use Principal Component Analysis (PCA) to isolate idiosyncratic shocks, PCA assumes that exposures to common factors are static over time. This is a threat to identification since global banks react differently to macroeconomic developments depending on the structure of their balance sheets, performance, and regulatory constraints. To address this concern and better isolate idiosyncratic shocks, I apply the Instrumented Principal Component Analysis (IPCA) from Kelly et al. (2019, 2020). This method jointly estimates unobserved latent factors and time-varying, bank-level exposures as functions of each bank's observed characteristics (such as liquidity ratios, profitability, and risk measures). While this paper does not focus on the determinants of banks' capital structure, it uses insights from this literature to select bank characteristics that help isolate leverage shocks (Gropp and Heider, 2010).

In the second step, I construct a valid instrument for aggregate global banks' leverage using the asset-size-weighted sum of these idiosyncratic shocks, following the Granular Instrumental Variables (GIV) approach of Gabaix and Koijen (2024). Given the

[3]For instance, Kalemli-Özcan (2019) highlights that the Federal funds rate affects the risk tolerance of global investors. Similarly, Lee and Bowdler (2020), using US monetary policy shocks identified based on narrative sources, find that global banks reduce leverage faster and more strongly after a monetary tightening, negatively affecting cross-border banking flows.

[4]As discussed below, the low frequency of financial statements makes it difficult to validate each estimated shock using a narrative identification strategy.

granular structure of the global banking sector, where a small number of large institutions account for a disproportionate share of total assets, idiosyncratic shocks to large banks do not average out, but instead have significant effects on aggregate outcomes. The GIV strategy exploits this feature to isolate exogenous variation originating from individual banks. While Gabaix and Koijen (2024) suggest using IPCA to construct a GIV with loadings dependent on characteristics, to my knowledge, this is the first paper to empirically apply IPCA for GIV construction, relaxing time-invariant loading assumptions. In the last step, I use the estimated instrument to study the dynamic causal effects of global banks' leverage on global liquidity through panel local projections (Jordà, 2005, 2023).

I find that idiosyncratic shocks to global banks' leverage have statistically and economically significant effects on all three indicators of global liquidity. Positive shocks to global banks' leverage are associated with looser global liquidity conditions, temporarily reducing dollar spreads, increasing cross-border inflows, and appreciating exchange rates versus the US dollar. The effects are significant even when controlling for a broad set of global and local factors. These include domestic macro-financial conditions, capital controls, and financial development, as well as global risk, US monetary policy, and the global business cycle, variables that the literature has identified as key drivers of the global liquidity measures (Koepke, 2019; Engel and Wu, 2024). For instance, the global financial cycle measure of Miranda-Agrippino and Rey (2022) is strongly correlated with cross-border flows and asset prices, and global banks' leverage, underscoring the importance of controlling for such confounding forces to isolate the independent effect of leverage shocks. The results confirm the systemic relevance of the G-SIBs, highlighting their role as sources of global shocks, not only as amplifiers or transmission channels.

The heterogeneity results sharpen this interpretation. First, I show that the effects differ across the global banks from which the shocks originate. Instruments constructed separately for US and non-US G-SIBs produce similar exchange-rate responses, while non-US bank shocks generate the significant EMBI-spread response and larger gross-inflow effects. Within non-US banks, European-bank shocks are more strongly associated with quantity-based measures of global liquidity, especially gross inflows, while Asian-bank shocks are more strongly associated with price-based measures, especially exchange rates and EMBI spreads. The comparison between G-SIBs and other banks reporting to the BCBS annual assessment further shows that the effects are concentrated among systemically important global banks.

Second, I show that the effects differ across recipient economies. Positive leverage shocks affect both advanced and emerging economies, but through different margins. The response of gross inflows is stronger in advanced economies, consistent with their larger and more elastic external balance sheets. In emerging economies, the response is clearer in the exchange market pressure index, suggesting that part of the adjustment takes place through foreign exchange intervention or monetary policy responses. Third, I compare the pre-GFC period with the post-GFC and pre-COVID period. G-SIB leverage shocks continue to affect global liquidity after the GFC, but the effects become weaker and less persistent, consistent with lower and less volatile leverage among global banks after the regulatory reforms that followed the crisis.

These findings are consistent with the crucial role of global banks' leverage as a key driver of the global financial cycle (Rey, 2015). Moreover, the observed loosening effect of shocks on global liquidity supports theories in which the leverage of financial institutions is the primary state variable driving financial conditions (Adrian et al., 2016). As highlighted by Adrian et al. (2016) and Fontaine et al. (2025), macro-finance models offer conflicting predictions regarding the relationship between financial institutions' leverage and financial conditions. While some frameworks emphasize that increased equity among financial institutions leads to more relaxed financial conditions, others underscore the role of procyclical leverage as the critical determinant shaping risk-taking behavior and asset prices, which usually include value-at-risk constraints (Cohen et al., 2017)[5]. The findings presented in this paper align with the latter category of models and provide causal evidence on financial institutions' procyclical leverage (Coimbra and Rey, 2024; Kalemli-Ozcan et al., 2012)[6].

The literature has emphasized the role of global banks' direct lending to their subsidiaries, branches, and other domestic banks in transmitting international shocks (De Haas and Van Lelyveld, 2014; Claessens and Van Horen, 2014)[7], with much of this work focusing on the effects of leverage on cross-border bank flows (Bruno and Shin, 2015b). Departing from this focus, I find significant effects of leverage on total cross-border flows. This aligns with the perspective of Correa et al. (2025), who argue that global banks drive the financing "that supports the leverage of other financial institutions and determines asset prices" (p. 9). The findings are highly relevant to policymakers, confirming the importance of global banks' leverage for international financial stability, especially in the current regulatory and market environment. By identifying the causal role of leverage adjustments among G-SIBs as drivers of global liquidity, the paper provides insights into

[5] Oskolkov (2025) provides a foundation for self-imposed value-at-risk constraints, based on the variance of returns and expected profits derived from concerns about model misspecification. In this model, investors are heterogeneous, risk-taking is driven by changes in risk attitudes, and individual risk limits aggregate into a representative investor whose overall risk limit is the wealth-weighted average of the individual limits.

[6] Nuño and Thomas (2017) shows bank leverage fluctuates significantly more than equity capital or output. Leverage levels and procyclicality increase with bank size and internationalization (Acalin, 2023; Pedrono, 2022). An opposite view can be found in Gropp and Heider (2010), who, exploring the determinants of banks' capital structure, suggest that bank-specific leverage targets are time-invariant.

[7] See Avdjiev et al. (2019) for a different perspective.

the transmission channels through which banking sector dynamics generate cross-border spillovers. This understanding is critical for designing effective regulatory frameworks that mitigate adverse externalities, stabilize capital flows, and support exchange rate stability, particularly in emerging markets exposed to shifts in global financial conditions.

Finally, I explore the validity of the results by estimating the regression separately for advanced and emerging economies, and for the period after the Global Financial Crisis and before COVID-19.

The results are robust across alternative GIV specifications and measures. In these robustness checks, I explore the stability of the results by constructing different GIVs. For this, I use static loadings on the common factors, mean asset shares as weights, alternative weights based on G-SIBs' interconnectedness and cross-jurisdictional activity scores, and leads of the instruments. Additionally, I compare the results of the baseline model with regressions based on different raw measures of global banks' leverage used in the literature. I also use an exchange market pressure index and stock market returns as the dependent variables to study the effect of the shocks on exchange market pressure, considering both changes in policy interest rates and official interventions and other asset prices. Finally, I explore alternative controls. To control for US monetary policy, I use shadow short rates that account for the effect of quantitative easing and measures of monetary policy shocks. I also include a measure of the intensity of prudential policies for a smaller panel of countries. The robustness checks confirm the main results.

Related Literature. This paper contributes to several strands of literature. A central focus of this literature has been the impact of global banks' leverage on cross-border bank flows. Bruno and Shin (2015b) present a framework where global banks' leverage drives cross-border bank flows, supported by panel regression findings. Bruno and Shin (2015a) use a VAR model to show that US broker-dealers increase leverage when US monetary policy is loose, which increases cross-border bank flows, and depreciates the US dollar. Cesa-Bianchi et al. (2018) implement a panel VAR model with multiple countries, finding similar results, while Cerutti et al. (2017) highlight the role of non-US banks' leverage in driving global liquidity. This paper departs from these authors, identifying the effects of global banks' leverage on total gross inflows, rather than focusing solely on bank flows.

The empirical literature on the effects of global banks' leverage on asset prices and exchange rates is also growing, motivated by recent theoretical contributions in the fields of intermediary asset pricing and the renewed portfolio-balance approach (Gabaix and Maggiori, 2015; He et al., 2017; Obstfeld and Zhou, 2022). Adrian et al. (2011) use financial institutions' aggregated data to explain excess returns in foreign exchange rate markets[8]. He et al. (2017) use the leverage of primary dealer counterparties of the New York Federal Reserve to explain cross-sectional variation in expected returns, including exchange rates, sovereign bonds, and credit default swaps. Correa and DeMarco (2025) find that non-US dealers' leverage has predictive power for exchange rates, while the effects for US dealers are insignificant. Adrian and Xie (2020) explore the causal effects of non-US banks' demand for US dollars on the US dollar exchange rate, finding that higher leverage increases demand for US dollar assets, appreciating the US dollar. Studying how global banks' capital affects the transmission of global shocks, Morelli et al. (2022) find that foreign currency sovereign and corporate bonds held by distressed global banks experienced larger price contractions around the Lehman Brothers bankruptcy. Arnabal et al. (2025) show that positive high-frequency shocks to global banks' net worth increase inflows, reduce spreads, and appreciate exchange rates in emerging economies. This paper contributes to both strands of literature by providing causal evidence of the effects of global banks' leverage on gross inflows, exchange rates, and foreign currency spreads.

This paper also contributes to the literature using the Granular Instrumental Variables approach pioneered by Gabaix and Koijen (2024) with a novel empirical application of the IPCA method for the construction of the granular instrument. There is a growing literature applying GIV to study shocks from global banks and other financial institutions. Camanho et al. (2022) use a GIV based on idiosyncratic shocks from large funds to estimate the causal effect of equity flows on exchange rates. Aldasoro et al. (2023b) study the causal impact of cross-border banking flows on emerging economies using panel local projections. Becker et al. (2024) explore how US and foreign banks' US dollar syndicated lending affects the US dollar exchange rate, constructing a GIV based on shocks to the bank flows. They find stronger effects when US broker-dealers' leverage is low. Bippus et al. (2023) use cross-border position data of UK-resident banks to construct a GIV, finding significant effects of idiosyncratic demand flows on the exchange rate. They find that lower capital ratios increase the size of these effects[9]. Using supervisory microdata from the foreign exchange trading desks of global banks, Barbiero et al. (2024) construct a GIV to analyze risk limits. They find that shocks to these limits increase bid–ask spreads and reduce turnover in FX markets, which ultimately impacts currency returns and drives deviations in covered interest parity. This paper contributes to this literature by exploring the effects of idiosyncratic shocks to banks' leverage. In this line, the paper most closely related to this one is Acalin (2023), which studies the relationship between global banks' leverage and net cross-border flows, constructing a GIV based on the leverage of global banks. Unlike Acalin (2023), this paper extends the analysis to

[8]Cesa-Bianchi et al. (2019a) find that other measures of risk appetite, such as credit conditions surveys, also have predictive power for exchange rate excess returns.

[9]The authors extend the model of Gabaix and Maggiori (2015) to include heterogeneous risk-bearing capacities across banks. However, they focus on shocks to their heterogeneous expected returns.

exchange rates, emerging market bond spreads, and gross cross-border inflows, capturing how global banks' leverage drives global liquidity.

Roadmap. The remainder of this paper is organised as follows. Section 2 describes the bank-level and macroeconomic data used in the empirical model. Section 3 outlines the methodology for estimating the GIV and the panel local projections. Section 4 presents the baseline findings and the heterogeneity analyses by bank type, recipient economy, and period. Section 5 reports robustness exercises. Finally, Section 6 concludes.

2 Data

My sample consists of bank-level data from 34 G-SIBs headquartered in 12 countries and country-level data from 74 advanced and emerging market economies. The sample covers quarterly data from 2000Q1 to 2022Q4.

2.1 Global banks' data

The sample of global banks consists of 34 institutions classified as G-SIBs by the Basel Committee on Banking Supervision (BCBS) at least once between 2013 and 2023[10] The BCBS's assessment methodology for G-SIBs is based on different scores, which are calculated by comparing various indicators — such as size, interconnectedness, and cross-jurisdictional activity — against corresponding denominators that represent the totals in the sample of reporting banks[11]. These banks are, by definition, globally active and large institutions. As Gabaix and Koijen (2024) indicate, it is possible to construct GIVs using a subset of the top entities [12]. In further analyses, I include an expanded sample of 94 reporting banks that participated in the annual BCBS G-SIB assessment exercise.

A strong granular instrument requires a high degree of concentration in the global banking system (Gabaix and Koijen, 2024). This concentration can be observed at both

[10]The BCBS sample of G-SIBs begins in 2013. This paper does not identify which banks would have been potentially classified as G-SIBs prior to this year. However, the literature suggests that many of these institutions would have fit this categorization in earlier years. Alessandri et al. (2015) develop a methodology to identify G-SIBs and apply it to the 2007-2012 period, finding that the top G-SIBs demonstrate a relatively high degree of stability over time. For the 2000-2006 period, Carmassi and Herring (2016) show that the composition of these systemic entities remained largely the same; all Large and Complex Financial Institutions identified by Bank of England (2002) eventually became G-SIBs, except for ABN Amro, Lehman Brothers, and Merrill Lynch, which either collapsed or were acquired by surviving G-SIBs during the 2008 financial crisis.

[11]In turn, the sample of reporting banks is defined by the leverage ratio exposure measure. All banks exceeding 200 billion euros, or that have been classified as a G-SIB in the previous year, are required to report the indicators to their national supervisory authorities

[12]In this line, Acalin (2023) selects 23 banks based on their average asset size. In turn, my sample is based on banks' systemic importance as defined by the BCBS.

the banking-system and bank levels (Aldasoro and Ehlers, 2019; Avdjiev et al., 2021; Ioannou et al., 2019; Schoenmaker, 2017), as also shown in Table 1. This concentration has remained significant in recent years. Between 2016 and 2023, these 34 banks accounted for 61% of total claims and 65% of total cross-jurisdictional claims reported in the consolidated banking statistics of the Bank for International Settlements. Importantly, concentration remains high within the sample. The 10 largest banks alone accounted for 35% of total claims and 32% of total cross-jurisdictional claims. Similarly, the sample's asset-share excess Herfindahl — a standard measure of concentration — is 10%. These metrics support the application of the GIV methodology to this set of banks.

Based on this sample, I use quarterly bank-level financial accounts from Fitch Connect. In line with He et al. (2017) and Coimbra and Rey (2024), I rely on consolidated balance sheet data (at the holding company level). As He et al. (2017) argue, using holding-company balance sheets acknowledges the role of internal capital markets in the mitigation and contagion of shocks across the different businesses of the holding company (d'Avino and Shabani, 2025; Berrospide et al., 2016). This is particularly important in the case of global banks, as they are present across different types of financial markets and geographical locations. In cases where multiple types of statements for each bank are available, I follow the selection criteria of Raddatz et al. (2024)[13]. Following Acalin (2023), I remove bank-quarter observations with negative equity and leverage higher than 100. The sample is an unbalanced panel, as some bank holding companies started their operations after 2000. Institutions that appear later because of mergers, restructurings, or data availability constraints enter the sample only from their first observed consolidated statement onward.

The sample consists of 3,010 bank-quarter observations. I calculate total assets in US dollars using end-of-quarter exchange rates to compute the banks' quarterly asset shares. I calculate leverage as the ratio of assets over book equity in line with Adrian et al. (2016), who find that this measure better captures how financial institutions affect financial conditions[14]. While including off-balance-sheet leverage could capture a broader set of G-SIB operations, data availability limits this. Adrian et al. (2018) indicate that market leverage can provide useful information about market participants' assessment of banks' creditworthiness or their perceptions of banks' off-balance-sheet leverage, which in turn can affect banks' funding conditions and book leverage. While market leverage is an imperfect substitute for off-balance-sheet data, Section 5 complements the baseline

[13]Raddatz et al. (2024) keep only financial statements based first on quality type (with the order of priority: restated, original, preliminary, partial), audited/qualified categories (audited-unqualified and audited-qualified), and accounting standards (international financial reporting standards, international accounting standards, local generally accepted accounting principles, US GAAP, regulatory).

[14]Book equity is especially relevant for lending behavior because it captures the capital against which losses can be covered (Adrian et al., 2018).

specification with alternative raw and market-based leverage measures.

Table 1 lists the 34 G-SIBs, headquartered in 12 countries (Canada, China, Finland, France, Germany, Italy, Japan, Netherlands, Spain, Switzerland, the United Kingdom, and the United States).

	Name	Country	XJ claims share (%)	Asset share (%)	Leverage (Ratio)	Leverage (Std. Dev.)
1	HSBC	GB	5.45	1.20	24.32	7.43
2	BNP Paribas	FR	4.07	2.99	26.52	5.30
3	Santander	ES	3.69	1.97	16.55	2.34
4	Citigroup	US	3.09	2.36	12.56	3.29
5	Deutsche Bank	DE	2.89	2.03	31.96	10.61
6	Barclays	GB	2.80	1.88	25.92	6.53
7	MUFG	JP	2.65	3.15	22.73	6.57
8	ING Bank	NL	2.65	1.23	27.76	7.65
9	JP Morgan	US	2.47	3.39	13.50	2.64
10	Standard Chartered	GB	1.96	0.85	16.44	2.08
11	UBS	CH	1.91	1.23	28.72	12.55
12	Société Générale	FR	1.82	1.87	27.60	4.70
13	Credit Suisse	CH	1.79	1.00	22.93	6.16
14	Unicredit	IT	1.77	1.18	15.93	1.69
15	Bank of China	CN	1.64	3.74	14.86	1.75
16	Toronto Dominion	CA	1.61	1.25	19.53	3.26
17	Crédit Agricole	FR	1.61	2.67	20.52	3.11
18	SMFG	JP	1.59	2.04	24.49	10.06
19	RBC	CA	1.56	1.23	20.84	2.40
20	Goldman Sachs	US	1.49	1.25	16.05	4.19
21	Mizuho	JP	1.48	2.10	34.32	16.90
22	Nordea	FI	1.42	0.83	21.78	2.54
23	Bank of America	US	1.41	2.92	11.28	1.52
24	BBVA	ES	1.35	0.95	16.22	3.25
25	RBS	GB	1.24	0.74	29.73	5.99
26	Morgan Stanley	US	1.15	1.10	18.42	7.58
27	ICBC	CN	0.82	5.02	15.77	3.60
28	BPCE	FR	0.81	1.79	20.69	4.10
29	Wells Fargo	US	0.49	2.18	11.01	1.34
30	China Construction	CN	0.35	4.25	15.05	3.28
31	BNY Mellon	US	0.34	0.46	9.76	1.52
32	BoComm	CN	0.32	1.65	19.35	11.79
33	State Street	US	0.30	0.31	13.70	2.79
34	Agricultural Bank	CN	0.21	4.12	22.37	13.03

Table 1: List of 34 G-SIBs in the sample. Note: Cross-jurisdictional (XJ) claims share and asset share are calculated with BIS data between 2013 and 2023. Mean and standard deviation of leverage are calculated with 2000–2022 data.

The bank characteristics used in Section 3.1 are grounded in the literature on bank capital structure (Antoniou et al., 2008; Gropp and Heider, 2010; Lee et al., 2017). These include measures of profitability (dividend payout ratio, net interest margin, non-interest expense over total operating income), risk (loan loss provisions over gross loans, net charge-offs over average gross loans, non-performing loans over gross loans, and risk-weighted assets over total assets), liquidity (liquid assets over wholesale liabilities), and size (the logarithm of total assets). They also include lagged bank leverage and a dummy for changes in accounting standards.

2.2 Aggregate data

Dependent variables. The main dependent variables used as measures of global liquidity include the nominal exchange rate of each country versus the US dollar (where a higher value indicates a more depreciated local currency) for 65 economies, the Emerging Market Bond Index (EMBI) spread for 36 emerging economies and gross cross-border inflows for 74 economies. The data for exchange rates and cross-border inflows come from the International Financial Statistics (IFS) of the International Monetary Fund (IMF). These include foreign direct investment inflows, portfolio investment inflows (which include bonds and equity), and other investment inflows (mostly bank instruments, such as loans and deposits). The EMBI spreads are published by JP Morgan and collected from Datastream. This index represents the weighted averages of yield spreads of bonds denominated in US dollars over US government debt securities at the same maturities. Country-level summary statistics are included in Table 8 of the Appendix.

Local controls. To account for country-specific economic conditions, I include quarterly data on real GDP growth, inflation rates, deposit interest rates, and domestic credit growth from the IFS-IMF dataset. I also include the exchange rate regime classification from Ilzetzki et al. (2022) and the measure of countries' capital inflow restrictions from Fernández et al. (2016). Domestic prudential policies interact with global liquidity, affecting cross-border flows (Bussière et al., 2021; Takáts and Temesvary, 2021). Because of this, I include the index of prudential instrument use intensity from Cerutti et al. (2016) in a robustness exercise, given that these data are available for a smaller sample of countries.

Global controls. To control for other global financial factors impacting global liquidity, I include the CBOE volatility index (VIX) and the effective federal funds rate, both obtained from the Federal Reserve Economic Data. As discussed in Section 4, the effective federal funds rate does not fully capture unconventional monetary policies or certain monetary policy surprises. Consequently, I supplement this rate with the US shadow short rates from Wu and Xia (2016) and the US monetary policy shocks from Bu et al. (2021) in subsequent analyses. To control for global factors related to the global business cycle, I include the US and global (excluding the US) real gross domestic product (GDP) growth rate from the database of Global Economic Indicators from the Federal Reserve Bank of Dallas (Grossman et al., 2014). Global variables are included both as controls in the panel local projections regression and as observable common factors in the IPCA estimation of Section 3.1.

3 Econometric methodology

This section presents the econometric methodology for estimating the causal effect of global banks' leverage on global liquidity. Expressed in simple terms, as in Aldasoro et al. (2023b), the main objective is to identify the coefficient β^y:

$$\begin{aligned} y_t &= \beta^y L_t + \epsilon_t^y \\ L_t &= \sum_b s_b l_{b,t} \end{aligned} \tag{1}$$

where y_t is a measure of global liquidity and L_t is global banks' aggregate leverage. The latter is constructed as the weighted average of the leverage $l_{b,t}$ of each bank b, using asset shares s_b as weights. The key challenge in this estimation is the potential endogeneity of global banks' leverage to the global liquidity measures and other confounding factors. This would imply that L_t and ϵ_t^y are correlated, leading to a potential estimation bias in β^y.

To address this potential endogeneity and identify the causal effect of global banks' leverage on global liquidity, I use a GIV approach, developed by Gabaix and Koijen (2024). This methodology exploits the granularity of data to construct an instrument based on the size-weighted sum of idiosyncratic shocks in markets where participant sizes are heterogeneous. Importantly, this approach requires correctly separating idiosyncratic shocks from changes in leverage driven by global liquidity and other common factors across global banks. Most papers use Principal Component Analysis (PCA) for this purpose. In the context of this paper, while PCA accounts for heterogeneous exposures to common factors across banks, it assumes that these exposures are static over time. This is a threat to identification since global banks react differently to macroeconomic developments depending on the structure of their balance sheets, performance, and regulatory constraints. For example, changes in the US Federal Reserve policy rate might affect banks differently depending on their holdings of marketable securities or current levels of leverage (Dell'Ariccia et al., 2014). Similarly, Damar et al. (2013) find that the procyclicality of bank leverage depends on both the liquidity conditions in wholesale funding markets and the degree of banks' reliance on that type of funding. In such scenarios, PCA may not fully remove the influence of common shocks from the estimated idiosyncratic components.

To capture these idiosyncratic shocks while properly accounting for time-varying exposures to common factors, I implement an IPCA (Kelly et al., 2019, 2020). This method jointly estimates unobserved latent factors and banks' time-varying exposures to both unobserved and observable common factors, using bank characteristics. Accounting for these characteristics allows the model to capture balance sheet developments, including those that may tighten or ease Basel III or domestic regulatory requirements, such as the risk-weighted capital ratio or the leverage ratio.

The estimation proceeds in three steps. First, I estimate G-SIB-level idiosyncratic shocks to leverage using IPCA. Second, I construct the GIV as the weighted average of the bank-level idiosyncratic shocks. Finally, I use this instrument to estimate the causal effect of global banks' leverage on exchange rates, cross-border flows, and EMBI spreads through a panel local projections framework.

3.1 Estimates of bank-level leverage shocks using Instrumented Principal Component Analysis

Suppose that the leverage of each bank depends on a set of bank-specific characteristics $X_{b,t}$ (including a constant), a set of common factors η_t, and bank-level idiosyncratic shocks $u_{b,t}$:

$$l_{b,t} = \underbrace{\alpha_{b,t}}_{X_{b,t-1}\Gamma_\alpha + u_{\alpha,b,t-1}} + \underbrace{\lambda_{b,t}}_{X_{b,t-1}\Gamma_\lambda + u_{\lambda,b,t-1}} \eta_t + u^*_{b,t} \tag{2}$$

The common factors η_t can include both observable η^o_t and unobservable latent factors η^l_t. Since $X_{b,t}$ includes a constant, the dynamic factor loadings $\lambda_{b,t}$ include both time-varying loadings that depend on the bank's characteristics and fixed loadings through time. Finally, the set of coefficients Γ_α and Γ_λ define the mapping from the bank characteristics to the observable and unobservable common factors.

The empirical estimation of equation 2 is challenging since both loadings and latent factors are unobservable. To address this, I implement the IPCA method from Kelly et al. (2019, 2020). This method efficiently and consistently estimates unobserved latent factors and banks' exposures to these factors using observable bank characteristics as instrumental variables. Additionally, this method allows the inclusion of pre-specified observable factors. If bank characteristics determine how leverage reacts to common shocks, this relationship will appear in the estimated loadings of the factors on the characteristics Γ_λ. Otherwise, if the characteristics affect banks' leverage directly, this will be attributed to the intercept Γ_α. The IPCA method allows estimation not only of the bank-specific time-varying coefficients $\alpha_{b,t}$ and $\lambda_{b,t}$, but also of a pre-specified number of latent common factors η^l_t.

Following Kelly et al. (2019), I run the empirical counterpart of equation 2:

$$l_{b,t} = X_{b,t-1}\Gamma_\alpha + X_{b,t-1}\Gamma_\lambda \eta_t + u_{b,t} \tag{3}$$

where $l_{b,t}$ is the book leverage (assets over book equity) of G-SIB b at period t. The residual $u_{b,t}$ is a composite error given by $u_{b,t} = u^*_{b,t} + u_{\alpha,b,t-1} + u_{\lambda,b,t-1}\eta_t$, with $u_{\alpha,b,t-1}$ and $u_{\lambda,b,t-1}$ being errors in the estimation of the true factor model parameters. In the context of the GIV estimation, the composite error recovered with IPCA, $u_{b,t}$, is an idiosyncratic shock. This holds, first, because $u_{\alpha,b,t-1}$ is a shock to the leverage of bank b, not a common shock to other banks. Second, as Gabaix and Koijen (2024) highlight, $u_{b,t}$ remains an idiosyncratic shock even if there are unexpected changes in the loadings, meaning that the leverage of a global bank changes more than expected in response to a common shock $u_{\lambda,b,t-1}\eta_t$[15]. Therefore, $u_{b,t}$ can be used to construct a granular instrument.

The banks' characteristics and the observable common factors used in this step are described in Section 2, following the relevant variables in the literature on bank capital structure (Antoniou et al., 2008; Gropp and Heider, 2010; Lee et al., 2017). Following Aldasoro et al. (2023b), I include three latent factors. Figure 5 shows the estimated loadings of the factors on the characteristics, and Figure 6 shows the estimated latent factors. Only the residuals and the latent factors from this regression are used in the following steps. In line with Holm-Hadulla and Thürwächter (2024), I further check the degree of idiosyncrasy of the shocks by estimating the correlation of $u_{b,t}$ across banks. The median value of the coefficients is 0.0007, showing no systematic relationship between banks' shocks.

3.2 Constructing the granular instrumental variable

For the aggregation of the bank-level idiosyncratic shocks, I use lagged bank asset shares as weights s_b. These shares are calculated from assets in US dollars using end-of-quarter exchange rates. By weight-averaging these shocks, the instrument reacts more strongly to idiosyncratic shocks to larger global banks (Becker et al., 2024). Using these shares, I construct a granular instrument as the difference between the weighted and unweighted average of the idiosyncratic shocks[16]:

$$z_t = \sum_b s_{b,t-1} u_{b,t} - \sum_b \frac{1}{N_{t-1}} u_{b,t} \tag{4}$$

Figure 1 plots the normalized time series of the instrument z_t, alongside some of the global control variables. Table 9 shows the pairwise correlations among the estimated GIV, the mean leverage of global banks, and the global control variables. The GIV is significantly correlated with global banks' leverage, but it is not significantly correlated

[15]This is also true if the volatility of idiosyncratic shocks to leverage depends on the common shocks (Gabaix and Koijen, 2024): $u_{b,t} = \sigma_t v_{b,t}$, where σ_t and (η_t, ε_t) are correlated, but $v_{b,t}$ is independent of $\sigma_t(\eta_t, \varepsilon_t)$.

[16]Following Aldasoro et al. (2023b) and Acalin (2023), I present the intuition behind this approach. Ignoring other control variables, and assuming that $\lambda_{b,t} = \lambda$, the granular instrument can be constructed

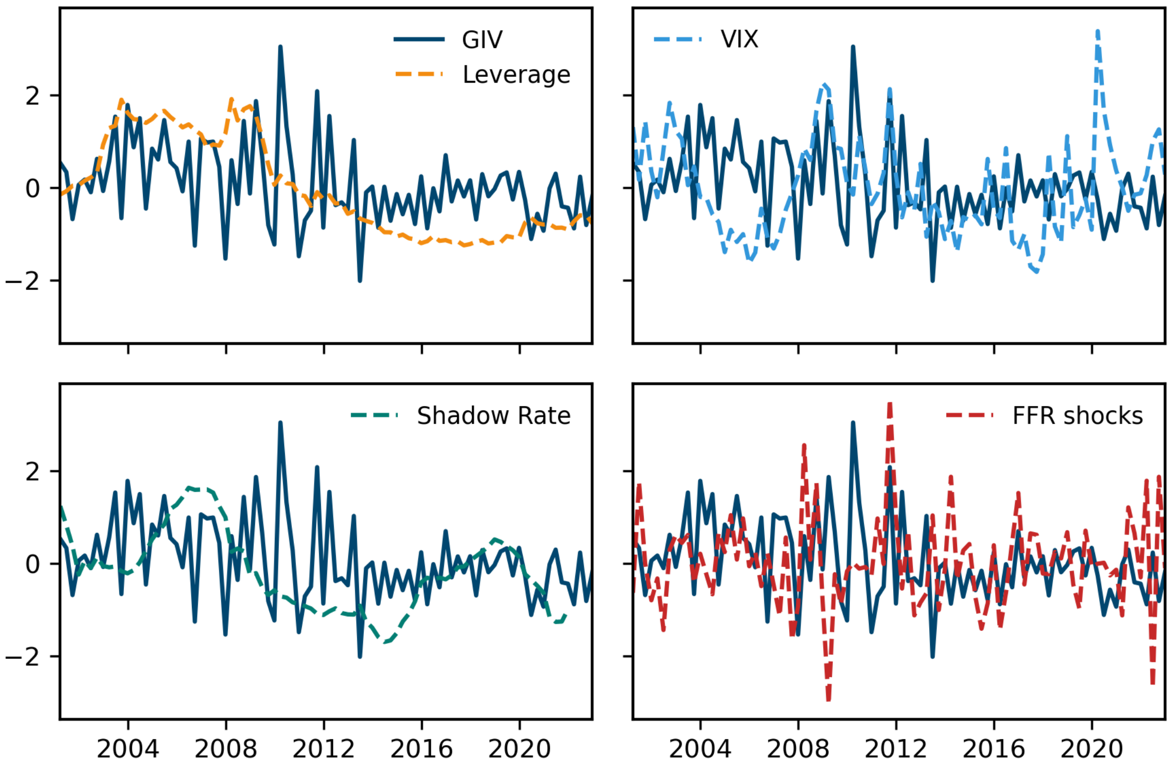

Figure 1: Evolution of z_t (GIV), global banks' leverage, VIX, US shadow short rates from Wu and Xia (2016) and the US monetary policy shocks from Bu et al. (2021).

with the other global factors. This is consistent with the interpretation of z_t as capturing bank-specific leverage disturbances beyond standard global factors. Importantly, after the Global Financial Crisis, leverage has not only been lower, but the variance of idiosyncratic leverage shocks has also declined. This pattern suggests that post-crisis regulation, together with G-SIBs' own risk-management practices, has led to tighter and less volatile leverage management among these institutions.

as the difference between global banks' weighted average leverage L_t and mean leverage $\bar{L}_t$:

$$
\begin{aligned}
z_t = L_t - \bar{L}_t &= \sum_b \left(s_b l_{b,t} - \frac{1}{N} l_{b,t} \right) \\
&= \sum_b \left(s_b(\lambda\eta_t + u_{b,t}) - \frac{1}{N}(\lambda\eta_t + u_{b,t}) \right) \\
&= \lambda\eta_t - \lambda\eta_t + \sum_b s_b u_{b,t} - \sum_b \frac{1}{N} u_{b,t} \\
&= \sum_b s_b u_{b,t} - \sum_b \frac{1}{N} u_{b,t}
\end{aligned}
$$

3.3 Estimating the effect of global banks' leverage shocks using panel local projections

Using the granular instrument estimated in Section 3.2, I study the dynamic effects of global banks' leverage on global liquidity. For this, I employ panel local projections (Jordà, 2005). As discussed by Jordà (2023), this approach is less sensitive to misspecification than vector autoregressive models, with a straightforward implementation on panel data. I run the following panel regression for each dependent variable and horizon h:

$$y_{j,t+h} = \mu_j^h + \beta^h z_t + \theta^h G_t + \phi^h D_{j,t} + \varphi^h y_{j,t-1} + \epsilon_{j,t+h} \tag{5}$$

where $y_{j,t+h}$ is, for each country j, either the log difference of the exchange rate, the EMBI spread, or cumulative total cross-border inflows (in per cent of the recipient economy's mean GDP over the previous four quarters) between period t and period $t+h$. μ_j^h is a country fixed effect. The main explanatory variable, z_t, is the granular instrument constructed in Section 3.2. G_t is a set of global control variables common to all countries, including the lagged value of z_t and the estimated latent common factors from Section 3.1[17]. $D_{j,t}$ is a set of domestic control variables related to country j, including the lagged value of the dependent variable, for which I use the change between periods $t-2$ and $t-1$. Finally, $\epsilon_{j,t+h}$ is the error.

4 Results

A summary of the estimated effects of the instrument on the dependent variables is presented in Table 2 and Figure 2. The coefficients for all controls and horizons are included in Table 10. Table 2 presents, for each dependent variable and selected horizon, the coefficient of the cumulative effect of global banks' leverage on the EMBI spread, exchange rate depreciations, and cumulative gross inflows up to 12 quarters ahead. The instrument is normalized, so the coefficient can be read as the effect of a one-standard-deviation shock.

[17]Gabaix and Koijen (2024) suggest including these variables in the regression since doing so increases the precision of estimators.

Table 2: Cumulative causal effect of global banks' leverage on EMBI spreads, exchange rate depreciations and gross cross-border inflows.

Indicator	Variable	1	2	4	6	8	10
EMBI spread	z_t	-4.32	-12.46 **	-29.43 ***	-11.09 **	-13.70 *	-15.90 ***
	R^2	0.54	0.32	0.13	0.07	0.05	0.05
	Observations	2566	2533	2467	2401	2335	2269
	Entities	36	36	36	36	36	36
Exchange Rate	z_t	0.16	-0.73 **	-1.64 ***	-1.53 ***	-1.73 ***	-2.05 ***
	R^2	0.05	0.05	0.05	0.04	0.05	0.05
	Observations	4500	4494	4481	4401	4279	4157
	Entities	65	65	64	64	64	64
Gross inflows	z_t	9.11 **	13.54 **	28.89 ***	37.28 **	51.39 **	65.39 **
	R^2	0.05	0.06	0.06	0.06	0.06	0.06
	Observations	5450	5447	5438	5299	5157	5015
	Entities	74	74	74	74	74	74

Note: *** p<0.01, ** p<0.05, * p<0.1. Standard errors clustered by entity.

Higher global banks' leverage is associated with looser global liquidity conditions, characterized by lower EMBI spreads, exchange rate appreciations, and larger gross cross-border inflows. These results are statistically and economically significant for cumulative exchange rate variations and gross inflows across all quarters at the 1% level. This implies that the effects of global banks' leverage are persistent and continue to influence these variables beyond the short term. For EMBI spreads, the coefficients are significant but less persistent: the response reverses after four quarters, then declines again before reverting. This supports the results of Rogers et al. (2025), who find that shocks to US banks' leverage are major drivers of the global financial cycle at medium-term horizons, together with US corporate excess bond returns and US term premiums.

The results confirm the systemic relevance of the G-SIBs, highlighting their role as sources of global shocks rather than just amplifiers or transmission channels of other shocks. These results support the key role of these banks in cross-border finance, which Kumhof et al. (2020) associates with their role in global money creation. Additionally, the findings confirm the crucial role of global banks' leverage as a key driver of the global financial cycle (Rey, 2015), particularly in influencing cross-border flows and exchange rates (Bruno and Shin, 2015b)[18]. Moreover, by finding that positive shocks to leverage cause looser global liquidity conditions, the paper supports theories where financial institutions' leverage is the key state variable driving financial conditions, which usually include value-at-risk constraints (Brunnermeier and Pedersen, 2009; Danielsson et al., 2012; Adrian et al., 2016)

[18]The significant effect on total cross-border flows suggests that global banks influence countries' financial conditions through channels beyond direct lending, a channel that, according to Cesa-Bianchi et al. (2019b), does not primarily transmit global credit conditions to financial stability.

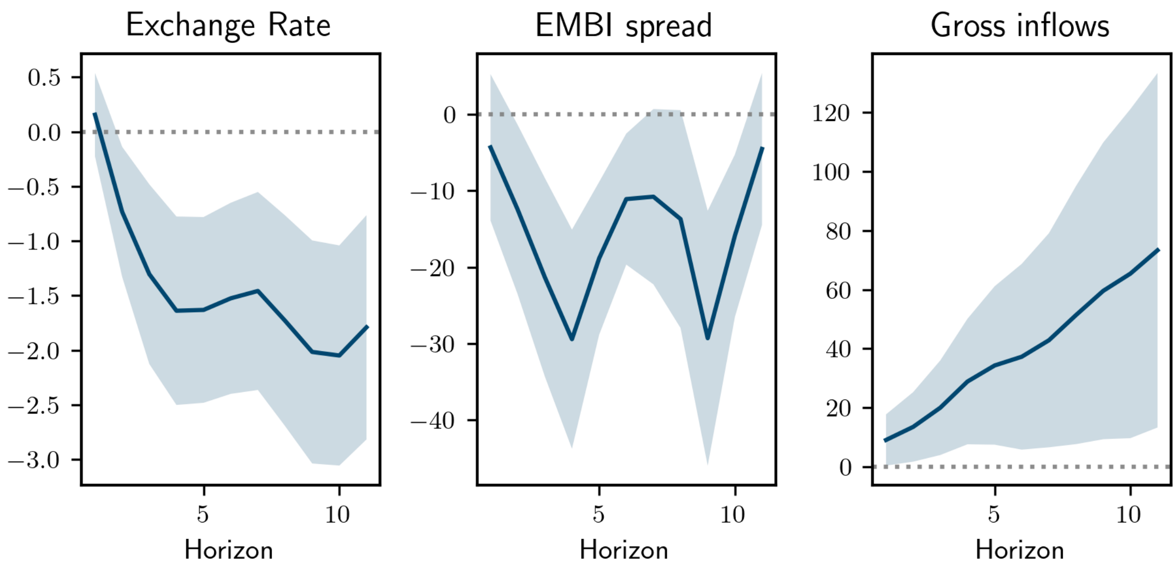

Figure 2: Cumulative causal effect of global banks' leverage on EMBI spreads, exchange rate depreciations and gross cross-border inflows. Note: The figure shows the cumulative average impulse responses in each country. The areas denote the 95 per cent confidence interval.

or time-varying risk attitudes (Minsky, 1977; Nikolaidi, 2014). The results are in line with the procyclicality of banks' leverage documented by Kalemli-Ozcan et al. (2012) for large European investment banks and by Adrian and Shin (2010) for large investment and commercial banks in Europe and the United States (Kalemli-Özcan and Kwak, 2020).

Following Gabaix and Koijen (2022), I run the regression including the estimated latent factors and excluding the instrument to estimate the importance of the common shocks for the dependent variables. Replicating this exercise, I find that the coefficients on the three recovered latent factors from Section 3.1 are significant, confirming the importance of their inclusion. The results are shown in Figure 7.

4.1 Heterogeneous effects by global banks' nationality and systemic importance

Both US and non-US global banks are included in the G-SIBs categorization. While US global banks mostly operate in their local currency, the US dollar, a large share of non-US global banks' cross-border operations are also denominated in this currency (Aldasoro and Ehlers, 2018a; Acharya et al., 2017). According to data from the BIS, non-US banks held about \$21 trillion each in US-dollar assets and liabilities by 2023, plus off-balance-sheet obligations estimated at twice that amount, surpassing the cross-border positions of US banks (McGuire et al., 2024). However, regulation and funding models imply that these banks are exposed to different risks (Bacchetta et al., 2025). This section explores whether leverage shocks from US and non-US global banks have heterogeneous effects on global liquidity, and whether these effects differ further between European and Asian G-SIBs.

The literature has also indicated that global banks behave differently from other banks because of their global reach and complexity, which expose them to a broader range of risks. Relevant for this paper, Acalin (2023) shows that the largest global banks exhibit both higher average leverage and greater leverage volatility over time compared to other large banks. To explore the impact of this heterogeneity, this section also compares the effects of leverage shocks from G-SIBs with those from other banks reporting to the BCBS annual assessment.

To explore the different effects of leverage shocks from US and non-US global banks, I calculate two instruments, $z_t^{US} = s_{b,t-1}^{US} u_{b,t}$ and $z_t^{non-US} = s_{b,t-1}^{non-US} u_{b,t}$, using the estimated idiosyncratic shocks of Section 3.1 and the asset shares of the US and non-US global banks. Using both instruments, I run the panel regression from equation 5. Overall, the results support the baseline model, addressing overidentification concerns (Gabaix and Koijen, 2024). As shown in Panel A of Table 3, the estimated coefficients for both instruments are similar and significant for exchange-rate variations at both horizons. For gross inflows, both coefficients are positive and significant, but the coefficient for non-US banks is larger at both $h = 4$ and $h = 8$. Meanwhile, the coefficient for the EMBI spread is only significant for non-US banks. Thus, the US-bank and non-US-bank instruments produce similar results for exchange rates, but the evidence of heterogeneity is stronger for EMBI spreads and gross inflows. In particular, non-US bank leverage shocks are associated with a significant decline in EMBI spreads and a larger increase in gross inflows.

To further explore the role of nationality, I disaggregate the non-US global banks into European and Asian global banks. Panel B of Table 3 reports the local projection estimates for the two regional GIVs. Positive leverage shocks to European banks drive the largest and most persistent increases in gross cross-border inflows. This is in line with Bostandzic and Weiss (2018), who find that European banks contribute more to global systemic risk than US banks, not only because of their larger size and lower loan portfolio quality but also because of their higher cross-border interconnectedness. The regional estimates show that European-bank shocks are positive and significant for gross inflows at both horizons, with coefficients of 32.31 at $h = 4$ and 67.08 at $h = 8$. By contrast, the coefficients for Asian-bank shocks are smaller and not statistically significant for gross inflows. For exchange rates, the opposite pattern is observed: Asian-bank shocks have larger and more significant coefficients than European-bank shocks. For EMBI spreads, both European and Asian bank shocks are negative and statistically significant, although the Asian-bank coefficients are somewhat larger. Overall, Panel B suggests that the non-US result masks regional heterogeneity: European-bank shocks are more strongly associated with quantity-based measures of global liquidity, while Asian-bank shocks are more strongly associated with price-based measures, especially exchange rates and EMBI spreads.

Finally, I explore the heterogeneous effects between banks classified at least once as G-SIBs and all other banks reporting to the BCBS. To assess whether these non-G-SIBs have similar effects on global liquidity, I expand the sample to include 60 additional reporting banks from the annual assessment. I estimate the IPCA on this broader 94-bank panel to improve the precision of the unobserved common factors. From the resulting residuals, I construct two distinct instruments: $z_t^{\text{G-SIBs}} = s_{b,t-1}^{\text{G-SIBs}} u_{b,t}$ (for the 34 G-SIBs) and $z_t^{\text{non-G-SIBs}} = s_{b,t-1}^{\text{non-G-SIBs}} u_{b,t}$ (for the remaining 60 banks)[19].

As shown in Panel C of Table 3, the effect of a positive idiosyncratic leverage shock from the G-SIBs is in line with the baseline results. The G-SIB instrument is negative and statistically significant for EMBI spreads and exchange-rate variations, and positive and statistically significant for gross inflows. The coefficients on shocks from the other reporting banks are insignificant for EMBI spreads and gross inflows, while their exchange-rate coefficients are positive and statistically significant, moving in the opposite direction to the G-SIB estimates. This supports the focus on G-SIBs in the baseline specification and indicates that the effects of bank leverage shocks depend on the systemic importance of the institutions from which those shocks originate.

Table 3: Heterogeneous effects by global banks' nationality and systemic importance

	EMBI spread		Exchange rate		Gross inflows	
	h=4	h=8	h=4	h=8	h=4	h=8
Panel A: US vs Non-US banks						
US-bank GIV	-0.76	0.65	-1.07 **	-1.21 **	17.64 **	42.04 **
Non-US-bank GIV	-25.11 ***	-13.05 *	-1.47 ***	-1.53 ***	29.09 ***	55.63 **
Panel B: European vs Asian banks						
European-bank GIV	-10.55 *	-18.03 **	-0.64 *	-0.61	32.31 **	67.08 **
Asian-bank GIV	-15.46 **	-20.98 **	-1.64 ***	-1.76 ***	13.84	9.40
Panel C: G-SIBs vs other reporting banks						
z_t	-19.86 ***	-13.77 **	-1.62 ***	-1.59 ***	20.22 **	44.15 **
Other-reporting-bank GIV	4.55	2.11	1.22 ***	1.75 ***	-5.34	2.52
R^2	0.11	0.04	0.02	0.02	0.04	0.04
Observations	2467	2335	4481	4279	5438	5157
Entities	36	36	64	64	74	74

Note: *** p<0.01, ** p<0.05, * p<0.1. Standard errors clustered by entity.

[19]The baseline specification is restricted to the 34 G-SIBs to ensure clean identification. The additional banks are more sensitive to regional cycles, implying a less homogeneous factor structure. Consequently, a uniform global factor model may fail to absorb this localized variation, leaving systematic components in the residuals ($u_{b,t}$) and violating the GIV assumption of purely idiosyncratic shocks.

4.2 Heterogeneous effects on advanced and emerging economies

The effect of global financial shocks can differ across countries because economies differ in their degree of financial integration, the size of their external balance sheets, and their exposure to global factors (Lane and Milesi-Ferretti, 2018; Aldasoro et al., 2023a; Kohler et al., 2023). Advanced economies tend to have larger gross external positions and deeper financial markets, making gross capital flows more responsive to global financial shocks (Lane and Milesi-Ferretti, 2018; Aldasoro et al., 2023a). In contrast, emerging economies are often more exposed to foreign-currency funding, rollover risks, and exchange-rate pressures, making external financial shocks more likely to appear through exchange-market pressure and policy adjustment (Cerutti et al., 2019; Koepke, 2019; Goldberg and Krogstrup, 2023). For this reason, the same shock to global banks' leverage can affect advanced and emerging economies through different margins (Aldasoro et al., 2023a; Kohler et al., 2023).

To explore this, I estimate the effect of shocks to global banks' leverage on advanced and emerging economies. For this, I use the current IMF World Economic Outlook classification. I do not include the EMBI among the dependent variables in this section, since this indicator, by definition, does not include advanced economies. The results presented in Table 4 support the baseline model. The coefficients have the same sign and are significant for both groups of countries. However, the effects on gross inflows are stronger for advanced economies. For exchange rates, the effect for emerging economies is not significant during the first seven quarters, which might be explained by the exchange rate regimes in these economies. Because of this, I include the EMP index in the country comparison. Unlike the exchange rate coefficients, the coefficients for the EMP are not only significant for emerging economies, but also significantly larger than those for advanced economies. This indicates that leverage shocks to global banks affect both advanced and emerging economies, but the relevant margin of adjustment differs across groups. In advanced economies, the strongest response is observed in gross inflows. In emerging economies, the response is clearer in the EMP index, suggesting that part of the adjustment takes place through foreign exchange intervention or monetary policy responses.

These results are in line with Aldasoro et al. (2023a), who find that their measures of the global financial cycle (the first principal component of gross flows) have stronger effects on exchange rates in emerging economies, while the effect on gross flows is stronger for advanced economies (see also Barrot and Serven, 2018; Cerutti et al., 2019). This may be related to the different levels of financial integration and vulnerability to global shocks across countries (Kohler et al., 2023). Advanced economies tend to have larger and more leveraged cross-border positions (Lane and Milesi-Ferretti, 2018). Shocks to

Table 4: Effects on Advanced and Emerging Economies

	EMP		Exchange rate		Gross inflows	
	h=4	h=8	h=4	h=8	h=4	h=8
Panel A: Emerging economies						
z_t	-1.27 ***	-1.68 ***	-1.29 *	-1.80 **	7.32 ***	15.45 ***
Panel B: Advanced economies						
z_t	-0.39 ***	-0.35 ***	-2.13 ***	-1.83 ***	40.58 **	77.79 **
R^2	0.18	0.24	0.03	0.04	0.01	0.02
Observations	1155	1091	2970	2829	2750	2589
Entities	17	17	45	45	44	44

Note: *** p<0.01, ** p<0.05, * p<0.1. Standard errors clustered by entity.

external funding conditions can reduce the return and increase the risks of these positions. The unwinding of these positions results in both large gross inflows and outflows, but with smaller effects on exchange rates. In turn, in less integrated countries, external funding might be used to roll over external obligations or fund trade imbalances. When external financial conditions deteriorate, residents' gross external positions are less elastic, creating stronger pressures on the exchange rate. In that scenario, domestic central banks might intervene directly in the exchange rate market or change their policy rate (Goldberg and Krogstrup, 2023). This is in line with the model of Oskolkov (2024), where domestic units from advanced economies reduce their holdings in external assets when foreign investors leave their economies, muting the effect on asset prices, while this channel does not occur in emerging economies.

4.3 Effects before and after the Global Financial Crisis

The role of global banks in the Global Financial Crisis (GFC) triggered several regulatory reforms and changes in these institutions' business models (Claessens, 2017; Buch and Dages, 2018). In particular, Basel III and other financial regulations strengthened the requirements associated with the risk-weighted and unweighted leverage ratios for G-SIBs. Consequently, global banks' leverage substantially decreased compared to pre-GFC values (Adrian et al., 2018; Caldentey, 2017). During the same period, bond markets and non-bank financial institutions overtook traditional banking in cross-border finance (Aldasoro and Ehlers, 2018b; Goldberg, 2024; Kim and Shin, 2021). These transformations could indicate that global banks have become less relevant in driving global liquidity. At the same time, if idiosyncratic leverage shocks became less volatile after the GFC, their effects could also become less persistent even if the underlying transmission mechanism remained relevant. To test this claim and determine whether the main results are driven by periods of stress in global financial markets, I compare the pre-GFC period (2000–2007) with the post-GFC and pre-COVID period (2010–2019).

Table 5 shows the results. In the pre-GFC period, the GIV is significant for EMBI spreads, exchange rates, and gross inflows at both horizons. The coefficients also have the expected sign across all dependent variables. In the post-GFC period, the exchange-rate response remains negative and highly significant at both horizons. However, the effects on EMBI spreads and gross inflows are less persistent, since they are significant at $h = 4$ but not at $h = 8$.

Table 5: Heterogeneous effects across sub-periods

	EMBI spread		Exchange rate		Gross inflows	
	h=4	h=8	h=4	h=8	h=4	h=8
Panel A: Pre-GFC (2000–2007)						
z_t	-36.77 ***	-24.65 ***	-2.79 ***	-1.40 **	16.28 **	42.04 **
R^2	0.17	0.14	0.19	0.20	0.12	0.14
Observations	1122	1122	2429	2417	3248	3248
Countries	20	20	41	41	52	52
Panel B: Post-GFC (2010–2019)						
z_t	-11.77 **	7.47	-2.46 ***	-2.03 ***	20.75 **	27.24
R^2	0.17	0.14	0.19	0.20	0.12	0.14
Observations	1122	1122	2429	2417	3248	3248
Countries	20	20	41	41	52	52

Note: *** p<0.01, ** p<0.05, * p<0.1. Standard errors clustered by entity.

These results show that G-SIB leverage shocks continued to affect global liquidity after the GFC, but the effects are weaker and less persistent than in the pre-crisis period. This is consistent with the decline in the variance of idiosyncratic leverage shocks after the crisis. Regulation and changes in banks' risk-management practices may have reduced the size and volatility of these shocks, without eliminating their relevance for global financial conditions.

The significant effects on total cross-border flows, and their persistence in the post-GFC period at shorter horizons, might be related to the different channels through which global bank shocks create spillovers to other financial institutions and relevant international investors. Acharya et al. (2024), in line with Michell (2024) and Sissoko (2025), present a perspective in which NBFIs and banks are not involved in two separate or competing businesses but are connected in a complex way. This perspective highlights banks' liquidity advantages, which are also related to their role in liquidity creation (Beck et al., 2023). An important implication of their perspective is that dependencies between banks and NBFIs have systemic risk consequences, as shocks spread through these local and cross-border connections (Aldasoro et al., 2020)[20]. However, this paper does not empirically explore these channels.

5 Robustness

To assess the robustness of my results, I explore various specifications of the GIV in the baseline model. These include using static factor loadings on common factors, mean asset shares as weights, alternative weights based on G-SIBs' interconnectedness and cross-jurisdictional activity scores, and leads of the instruments. I then compare the baseline model results with regressions using alternative raw measures of global banks' leverage found in the literature, as well as an exchange market pressure index and stock market returns. Finally, I explore alternative controls. To control for US monetary policy, I use shadow short rates that account for the effect of quantitative easing and measures of monetary policy shocks. I also include a measure of the intensity of prudential policies for a smaller panel of countries. The robustness checks confirm the main results.

5.1 Alternative GIV specifications

Static bank loadings on common factors. As discussed above, the empirical GIV literature has so far constructed the instrument using static factor loadings. To assess the sensitivity of my results to this assumption, I replicate the analysis under this approach, following a setting similar to Acalin (2023). As discussed above, using a larger sample of 327 banks, Gropp and Heider (2010) show that time-invariant bank fixed effects are important determinants of banks' capital structures, suggesting the presence of persistent, bank-specific leverage targets. These findings are not inconsistent with the results presented here. Even if bank fixed effects absorb persistent differences in leverage across banks, they do not preclude the existence of time-varying idiosyncratic leverage shocks. The GIV remains relevant as long as these residual idiosyncratic shocks continue to generate sufficient variation after the time-invariant component has been removed. In line with this, Panel A of Table 6 shows that, after introducing bank fixed effects, the GIV constructed from global banks' idiosyncratic leverage shocks remains significant across the dependent variables.

In line with the literature, to estimate $u^s_{b,t}$ I use a two-step procedure. First, I run

[20]For instance, through asset dependencies, global banks reducing their portfolio positions can depress asset prices and affect NBFIs holding similar assets, causing them to liquidate other international assets. Similarly, through liability dependencies, global banks tightening credit conditions to NBFIs can force the latter to reduce their cross-border investments.

the following panel regression:

$$l_{b,t} = \alpha_b + \gamma X_{b,t} + \lambda^o \eta_t^o + e_{b,t} \tag{6}$$

Following Acalin (2023), I include bank fixed effects. Unlike that study, I include the bank's characteristics and the observable common factors η_t^o in the regression to maintain comparability with the baseline model. In the second step, using the residuals $e_{b,t}$, I run a principal component analysis, extracting the first three latent common factors η_t^l and loadings λ_b^l:

$$e_{b,t} = \lambda_b^l \eta_t^l + u_{b,t}^s \tag{7}$$

Then I construct the GIV using the idiosyncratic shocks as described in Section 3.2. The static-loading estimates in Panel B of Table 6 support the baseline model, with only the EMBI spread presenting a different dynamic for longer horizons.

Mean asset shares as weights. In the baseline models I use the lagged value of the banks' asset shares as weights to construct the GIV. This requires the assumption that $u_{b,t}$ is independent of $s_{b,t-1}$. To verify the results without this assumption, I use the mean value of the banks' asset share s_b to construct an alternative instrument: $z_t^{\bar{s}} = \sum_b s_b u_{b,t}$. Panels C of Table 6 shows the results of the estimation using this instrument, supporting the main findings.

Alternative weights (interconnectedness and cross-jurisdictional activity). A potential concern with asset-weighted GIVs is the dominance of large banks that may be less active in cross-border markets (e.g., certain large Chinese state-owned banks). To address this and directly capture the global systemic footprint of a given institution, I construct an alternative set of weights using annual G-SIB assessment data reported to the BCBS. Because quarterly data are not available for the entire sample period, these weights are calculated as each bank's average share between 2013 and 2022, and are applied uniformly across the entire time sample for the GIV construction. Specifically, I compute a composite weight for each bank that captures both its international footprint and its systemic linkages. This composite measure is the equal-weighted average of two annual components: total cross-jurisdictional activity (the sum of cross-jurisdictional claims and liabilities) and total interconnectedness (the sum of intra-financial system assets, intra-financial system liabilities, and securities outstanding). As shown in Panels D–F of Table 6, the main results hold under this alternative specification, though the significance levels are marginally lower than in the baseline model.

Lags and leads. Alloza et al. (2025) indicate that many shocks display persistence, which might require corrections in the local projection estimates. They propose including leads of the shock. Following this, I include leads of the GIV one and two quarters ahead in the baseline regressions. Panel G of Table 6 show the results, which do not affect the findings of the baseline model.

Table 6: Alternative GIV specifications

	EMBI spread			Exchange rate			Gross inflows		
	h=1	h=4	h=8	h=1	h=4	h=8	h=1	h=4	h=8
Panel A: Fixed effects specification									
z_t^{FE}	-15.46 ***	-16.30 ***	-11.99 **	-0.20	-0.83 **	-0.98 **	9.32 **	23.28 ***	34.13 **
R^2	0.53	0.11	0.04	0.02	0.01	0.01	0.03	0.04	0.04
Observations	2566	2467	2335	4500	4481	4279	5450	5438	5157
Entities	36	36	36	65	64	64	74	74	74
Panel B: Static factor loadings									
z_t^{static}	-79.78 ***	-43.34 *	31.30	-1.24 *	-2.30	-1.73	76.59 ***	150.75 ***	247.36 **
Observations	2566	2467	2335	4500	4481	4279	5450	5438	5157
Entities	36	36	36	65	64	64	74	74	74
Panel C: Mean share weights									
$z_t^{\bar{s}}$	0.56	-21.31 ***	-5.79	0.21	-1.52 ***	-1.52 ***	10.86 **	31.84 ***	55.21 **
Observations	2566	2467	2335	4500	4481	4279	5450	5438	5157
Entities	36	36	36	65	64	64	74	74	74
Panel D: Composite weights									
$z_t^{\text{composite}}$	1.67	-4.75	-10.51	0.44 ***	-1.02 ***	-2.82 ***	4.39 ***	12.48 **	28.91 *
R^2	0.48	0.07	0.05	0.03	0.03	0.05	0.05	0.05	0.05
Observations	1464	1410	1338	3142	3130	3007	4221	4217	4019
Entities	20	20	20	42	41	41	52	52	52
Panel E: Interconnectedness weights									
$z_t^{\text{intercon.}}$	-2.69	-7.44	-10.75	-0.09	-1.60 ***	-3.03 ***	5.25 ***	13.54 **	17.67
R^2	0.49	0.08	0.06	0.06	0.06	0.10	0.08	0.08	0.07
Observations	1464	1410	1338	3142	3130	3007	4221	4217	4019
Entities	20	20	20	42	41	41	52	52	52
Panel F: Cross-jurisdictional activity weights									
z_t^{CJ}	5.62 **	-1.57	-10.41	0.72 ***	-0.56 ***	-1.98 ***	5.65 ***	15.48 ***	20.37 *
R^2	0.49	0.08	0.06	0.07	0.04	0.08	0.08	0.08	0.07
Observations	1464	1410	1338	3142	3130	3007	4221	4217	4019
Entities	20	20	20	42	41	41	52	52	52
Panel G: Including leads									
z_t	-2.61	-24.92 ***	-11.52 *	0.25	-1.31 ***	-1.20 ***	7.74 *	21.96 **	39.10 **
z_{t+1}	-11.32 ***	-12.47 *	6.54	-0.47 ***	-1.81 ***	-2.15 ***	16.90 ***	41.36 ***	78.42 ***
z_{t+2}	-3.44	-26.83 ***	-15.21 **	-0.72 ***	-1.74 ***	-3.08 ***	5.00 *	27.62 **	74.59 **

Note: *** p<0.01, ** p<0.05, * p<0.1. Standard errors clustered by entity.

Other specifications. In the baseline model, I use one-way entity clustering, in line with the recommendation of Petersen (2008). The results remain robust when using one-way time clustering, as recommended by Almuzara and Sancibrián (2024), two-way clustered errors (country and time), and heteroskedasticity-robust errors. They also remain robust to different specifications of the local and global controls. The baseline GIV specification is calculated using three latent factors, as described in Section 3.1. This is stable to the inclusion of one and two additional factors (Gabaix and Koijen, 2024).

Gabaix and Koijen (2024) suggest using additional information to narratively check the top idiosyncratic shocks used in the GIV, to confirm that these are valid idiosyncratic shocks. However, as Aldasoro et al. (2023b) indicate, it is challenging to identify the shocks precisely when the data are observed quarterly, which prevents a more accurate application of this validation strategy.

5.2 Raw measures of the global banks' leverage

In my baseline model, I use the GIV as the main explanatory variable. As already mentioned, this instrument is correlated with the weighted average of global banks' leverage. I check whether the results of the baseline model are sustained when running the same panel regression using alternative measures of global banks' leverage. These include the unweighted average and the median value of leverage of the 34 G-SIBs. I also include different measures used in the literature: US broker-dealers' leverage (Adrian and Shin, 2010), US commercial banks' leverage, and the market leverage of the primary dealer counterparties of the New York Federal Reserve, calculated by He et al. (2017)[21]. Importantly, He et al. (2017) use market leverage (book assets over market capitalization instead of book equity). Adrian et al. (2018) indicate that market leverage can provide useful information about investors' assessment of banks' creditworthiness, including their perceptions of banks' off-balance-sheet leverage. Since data availability on off-balance-sheet positions is limited, market leverage provides an imperfect proxy for off-balance-sheet leverage.

The results present similar coefficients, as observed in Figure 3, with the same sign and similar magnitude, except for the EMBI, which presents mostly non-significant coefficients. US primary dealers' market leverage is significant for the EMBI for all horizons except for the contemporaneous effect.

5.3 Alternative measures of global liquidity: Exchange rate pressures and asset prices

The effect of global shocks on the exchange rate can be muted by official interventions in the foreign exchange market and changes in the monetary policy rate. To account for this, I check the robustness of the results considering the exchange market pressure (EMP) against the US dollar from Goldberg and Krogstrup (2023). The EMP is calculated as a weighted sum of exchange rate depreciations, official foreign exchange intervention, and variations in the monetary policy interest rate. Goldberg and Krogstrup (2023) estimate the EMP for 31 countries, deriving the weights from balance of payments relationships, international portfolio demands, and valuation changes in these portfolios. Their index is constructed to express equivalent exchange rate depreciation units. The results are

[21] For the balance sheets of US broker-dealers and US commercial banks, I collect the data from FRED. The He et al. (2017) measure of primary dealers' market leverage is available and regularly updated at `https://zhiguohe.net/data-and-empirical-patterns/intermediary-capital-ratio-and-risk-factor/`.

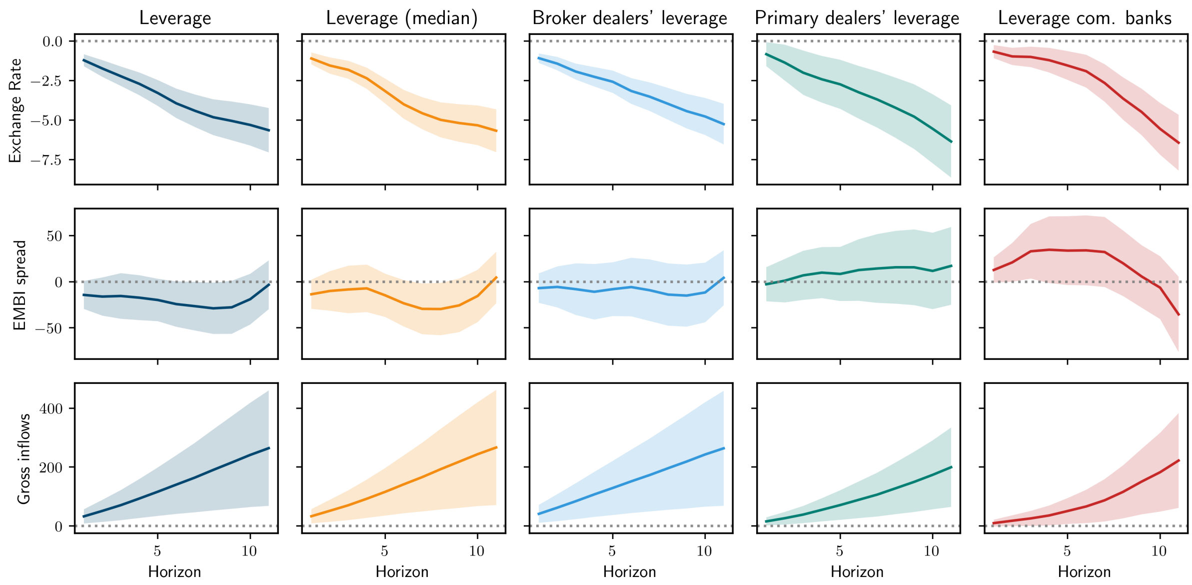

Figure 3: Cumulative effect of measures of global banks' leverage on EMBI spreads, exchange rate depreciations and gross cross-border inflows. Note: The figure shows the cumulative average impulse responses in each country. The areas denote the 95 per cent confidence interval.

presented in Figure 4. The coefficients are significant and in line with the effect of global banks' leverage on exchange rates.

As discussed above, the EMBI has the limitation of being restricted to emerging economies. Moreover, the global financial cycle literature has emphasized synchronicity between stock markets across the world (Miranda-Agrippino and Rey, 2022; Habib and Venditti, 2019). To explore this, I use country-level stock market returns from the Wharton Research Data Services-World Indices Large dataset. The sample includes 38 economies (23 advanced economies and 15 emerging economies). These indices are total-return, dividend-inclusive, market-capitalization-weighted indices constructed from Compustat Global Security. Figure 4 shows that global banks' leverage shocks increase asset prices in stock markets, in line with the argument that higher leverage is associated with looser global liquidity.

5.4 Alternative controls: shadow short rates, monetary policy shocks, and the intensity of prudential policies

While the baseline model relies on the effective federal funds rate to control for US monetary policy as a global factor, this rate may not fully reflect unconventional monetary policies such as quantitative easing during the zero lower bound period. To ensure the robustness of my findings, I estimate an alternative specification replacing the effective federal funds rate with the US shadow short rates from Wu and Xia (2016). This rate is

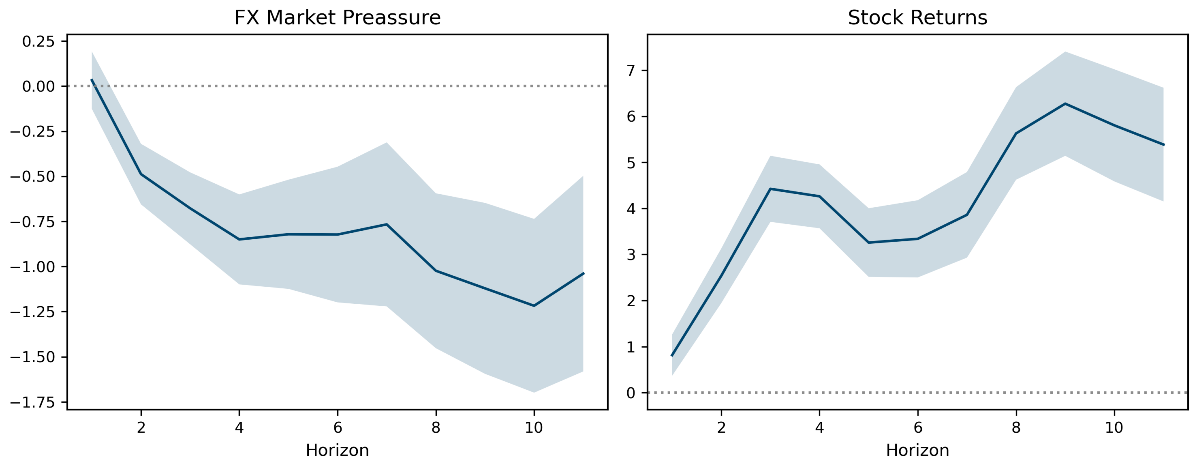

Figure 4: Cumulative causal effect of global banks' leverage on Exchange Market Pressure and Stock Returns. Note: The figure shows the cumulative average impulse responses in each country. The areas denote the 95 per cent confidence interval.

an empirical measure of the overall monetary policy stance for periods when the policy rate target range was between 0 and 0.25 percent.

Moreover, monetary policy surprises can occur even when the effective federal funds rate remains unaltered, for instance when markets expected an action that did not take place. These surprises affect global banks' cross-border lending (Giraldo et al., 2025). To account for this, I check the results using the US monetary policy shocks from Bu et al. (2021) as a control. The authors develop a measure of monetary policy shocks (actions or inactions) using a two-step Fama-MacBeth procedure to extract the common component of interest rate changes on Federal Open Market Committee announcement days across different maturities.

Finally, while the baseline model controls for countries' capital inflow restrictions using the measure from Fernández et al. (2016), different countries have also implemented other prudential measures in recent years to mitigate the effects of these flows, focusing on dimensions beyond the counterparty's residency. These policies, in turn, affect cross-border flows (Bussière et al., 2021; Takáts and Temesvary, 2021). To assess the sensitivity of the results to this broader policy environment, I additionally use the local index of prudential instrument intensity from Cerutti et al. (2016). However, I do not include this variable in the baseline model, since it reduces the estimation sample.

As reported in Table 7, the main results remain consistent across these alternative specifications, indicating that the baseline findings are not driven by either the particular proxy used for US monetary policy or the omission of additional prudential controls. In Panels B and C, the introduction of the BRW monetary policy shock and the change in the shadow short rate likewise do not materially alter the baseline results, as the coefficient on the baseline shock remains significant with the same sign in most medium- and long-horizon regressions. At the same time, these alternative US monetary policy controls display independent explanatory power at different horizons.

In Panel D, adding the prudential policy index leaves the coefficient on the baseline shock qualitatively unchanged across EMBI spreads, the exchange rate, and gross inflows, while the prudential policy index itself is not statistically significant in any specification. This might indicate that the indicator does not have explanatory power once the model already accounts for the effect of capital controls on inflows. Moreover, prudential policies are sometimes more oriented toward reducing the risk-taking of domestic financial institutions than toward reducing the effect of global factors on cross-border flows, exchange rates, or US dollar spreads. Overall, the results confirm that the main findings are robust to alternative specifications of both domestic prudential controls and US monetary policy conditions.

Table 7: Robustness checks: alternative controls

	EMBI spread		Exchange rate		Gross inflows	
	h=4	h=8	h=4	h=8	h=4	h=8
Panel A: Baseline						
z_t	-29.43 ***	-13.70 *	-1.64 ***	-1.73 ***	28.89 ***	51.39 **
Fed funds rate (diff.)	-31.56 **	-1.51	0.09	0.05	-16.35 **	25.54
Panel B: Prudential control						
z_t	-25.20 ***	-18.63 *	-2.48 ***	-2.49 ***	32.87 ***	58.95 **
Prudential policy index	8.14	-43.28	0.45	0.19	2.28	22.24
Panel C: Monetary policy shocks (BRW)						
z_t	-32.51 ***	-13.58 **	-1.62 ***	-1.76 ***	27.93 ***	53.85 **
BRW monetary policy shock	20.85 **	-6.72	1.42 ***	1.29 ***	-7.16	-7.98 **
Panel D: Shadow rate						
z_t	-28.41 ***	-14.02 **	-1.60 ***	-1.71 ***	25.82 **	53.75 **
Shadow short rate (diff.)	-21.16 **	-32.98 ***	-0.07	-0.85 ***	-4.14	18.83
R^2	0.13	0.05	0.05	0.05	0.06	0.06
Observations	2467	2335	4481	4279	5438	5157
Entities	36	36	64	64	74	74

Note: *** p<0.01, ** p<0.05, * p<0.1. Standard errors clustered by entity.

6 Conclusions

In this paper, I empirically examine the relationship between the leverage of 34 G-SIBs and global liquidity, using exchange rates, EMBI spreads, and gross inflows as proxy measures of the latter. To address possible endogeneity concerns and estimate causal effects, I employ a granular instrumental variables approach, using Instrumented Principal Component Analysis to isolate idiosyncratic shocks. The results show statistically and economically significant effects of global banks' leverage on exchange rate variations, foreign currency government spreads, and gross cross-border inflows. Higher levels of global banks' leverage are associated with lower EMBI spreads, exchange rate appreciations, and larger gross cross-border inflows. While most papers have focused on how global banks' leverage affects cross-border bank flows, I find evidence that these effects are relevant to total gross inflows. These findings highlight the importance of global banks not only as transmission channels but also as sources of global shocks. Robustness checks confirm the consistency of my results across alternative specifications.

In conclusion, this paper contributes to the expanding empirical literature on the drivers of the global financial cycle and the role of systemically important financial institutions. The evidence supports the key role of globally active banks and the importance of monitoring and regulating their balance-sheet dynamics.

References

Acalin, J., 2023. The global financial cycle meets global imbalances. Working Paper. Johns Hopkins University. Mimeo.

Acharya, V., Afonso, G., Kovner, A., 2017. How do global banks scramble for liquidity? evidence from the asset-backed commercial paper freeze of 2007. Journal of Financial Intermediation 30, 1–34.

Acharya, V., Cetorelli, N., Tuckman, B., 2024. Where Do Banks End and NBFIs Begin? Working Paper 32316. National Bureau of Economic Research.

Adams-Kane, J., Jia, Y., Lim, J., 2015. Global transmission channels for international bank lending in the 2007–09 financial crisis. Journal of International Money and Finance 56, 97–113.

Adrian, T., Etula, E., Groen, J., 2011. Financial amplification of foreign exchange risk premia. European Economic Review 55, 354–370.

Adrian, T., Kiff, J., Shin, H., 2018. Liquidity, leverage, and regulation 10 years after the global financial crisis. Annual Review of Financial Economics 10, 1–24.

Adrian, T., Moench, E., Shin, H., 2016. Dynamic leverage asset pricing. Staff Report 625. Federal Reserve Bank of New York.

Adrian, T., Shin, H., 2010. Liquidity and leverage. Journal of Financial Intermediation 19, 418–437.

Adrian, T., Xie, P., 2020. The non-US bank demand for US dollar assets. Working Paper 2020/101. International Monetary Fund.

Aldasoro, I., Avdjiev, S., Borio, C., Disyatat, P., 2023a. Global and domestic financial cycles: variations on a theme. International Journal of Central Banking 19, 49–98.

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

Aldasoro, I., Ehlers, T., 2018a. The geography of dollar funding of non-US banks. BIS Quarterly Review , December.

Aldasoro, I., Ehlers, T., 2018b. Global liquidity: changing instrument and currency patterns. BIS Quarterly Review , September.

Aldasoro, I., Ehlers, T., 2019. Concentration in cross-border banking. BIS Quarterly Review , June.

Aldasoro, I., Huang, W., Kemp, E., 2020. Cross-border links between banks and non-bank financial institutions. BIS Quarterly Review , September.

Alessandri, P., Masciantonio, S., Zaghini, A., 2015. Tracking banks' systemic importance before and after the crisis. International Finance 18, 157–186.

Alloza, M., Gonzalo, J., Sanz, C., 2025. Dynamic effects of persistent shocks. Journal of Applied Econometrics 40, 380–394. doi:10.1002/jae.3115.

Almuzara, M., Sancibrián, V., 2024. Micro responses to macro shocks. Staff Report 1090. Federal Reserve Bank of New York. doi:10.59576/sr.1090.

Antoniou, A., Guney, Y., Paudyal, K., 2008. The determinants of capital structure: capital market-oriented versus bank-oriented institutions. Journal of Financial and Quantitative Analysis 43, 59–92.

Arnabal, L.R., Camara, S., Dassatti, C., 2025. Global banks' spillovers to emerging markets: Macro to micro transmission. arXiv preprint arXiv:2512.01132. doi:10.48550/arXiv.2512.01132.

Avdjiev, S., Aysun, U., Hepp, R., 2019. What drives local lending by global banks? Journal of International Money and Finance 90, 54–75.

Avdjiev, S., Hardy, B., McGuire, P., von Peter, G., 2021. Home sweet host: A cross-country perspective on prudential and monetary policy spillovers through global banks. Review of International Economics 29, 20–36.

Avdjiev, S., Koch, C., McGuire, P., von Peter, G., 2018. Transmission of monetary policy through global banks: whose policy matters? Journal of International Money and Finance 89, 67–82.

Avdjiev, S., Serena, J., 2025. Banks' market capital and the international risk taking channel of US monetary policy. Journal of International Economics , 104099.

Bacchetta, P., Davis, J.S., Wincoop, E.V., 2025. Dollar Funding Fragility and Non-U.S. Global Banks. Report. Federal Reserve Bank of Dallas. URL: https://ideas.repec.org/p/fip/feddwp/101523.html, doi:10.24149/wp2531. working Papers.

Bank of England, 2002. Financial Stability Review. Report. Bank of England. URL: https://www.bankofengland.co.uk/-/media/boe/files/financial-stability-report/2002/june-2002.pdf.

Banti, C., Phylaktis, K., Sarno, L., 2012. Global liquidity risk in the foreign exchange market. Journal of International Money and Finance 31, 267–291.

Barbiero, O., Bräuning, F., Joaquim, G., Stein, H., 2024. Dealer Risk Limits and Currency Returns. Working Paper 24-11. Federal Reserve Bank of Boston. URL: https://www.bostonfed.org/publications/research-department-working-paper/2024/dealer-risk-limits-and-currency-returns.aspx, doi:10.29412/res.wp.2024.11.

Barrot, L.D., Serven, L., 2018. Gross capital flows, common factors, and the global financial cycle. Policy Research Working Paper 8354. World Bank.

Beck, T., Döttling, R., Lambert, T., Van Dijk, M., 2023. Liquidity creation, investment, and growth. Journal of Economic Growth 28, 297–336.

Becker, J., Schmeling, M., Schrimpf, A., 2024. Global bank lending and exchange rates. Working Paper 1161. Bank for International Settlements.

Berrospide, J., Black, L., Keeton, W., 2016. The cross-market spillover of economic shocks through multimarket banks. Journal of Money, Credit and Banking 48, 957–988.

Bippus, B., Lloyd, S., Ostry, D., 2023. Granular banking flows and exchange-rate dynamics. Staff Working Paper 1043. Bank of England.

Bostandzic, D., Weiss, G., 2018. Why do some banks contribute more to global systemic risk? Journal of Financial Intermediation 35, 17–40.

Brunnermeier, M., Pedersen, L., 2009. Market liquidity and funding liquidity. The Review of Financial Studies 22, 2201–2238.

Bruno, V., Shin, H., 2015a. Capital flows and the risk-taking channel of monetary policy. Journal of Monetary Economics 71, 119–132.

Bruno, V., Shin, H., 2015b. Cross-border banking and global liquidity. The Review of Economic Studies 82, 535–564.

Bu, C., Rogers, J., Wu, W., 2021. A unified measure of fed monetary policy shocks. Journal of Monetary Economics 118, 331–349.

Buch, C., Dages, B., 2018. Structural changes in banking after the crisis. CGFS Papers 60. Bank for International Settlements.

Bussière, M., Cao, J., De Haan, J., Hills, R., Lloyd, S., Meunier, B., Pedrono, J., Reinhardt, D., Sinha, S., Sowerbutts, R., 2021. The interaction between macroprudential policy and monetary policy: Overview. Review of International Economics 29, 1–19.

Caldentey, E., 2017. Quantitative easing (qe), changes in global liquidity, and financial instability. International Journal of Political Economy 46, 91–112.

Calvo, G., Leiderman, L., Reinhart, C., 1993. Capital inflows and real exchange rate appreciation in latin america: the role of external factors. Staff Papers 40, 108–151.

Calvo, G., Leiderman, L., Reinhart, C., 1996. Capital flows to developing countries in the 1990s: Causes and effects. Journal of Economic Perspectives 10, 123–139.

Camanho, N., Hau, H., Rey, H., 2022. Global portfolio rebalancing and exchange rates. The Review of Financial Studies 35, 5228–5274.

Carmassi, J., Herring, R., 2016. The corporate complexity of global systemically important banks. Journal of Financial Services Research 49, 175–201.

Cerutti, E., Claessens, S., Puy, D., 2019. Push factors and capital flows to emerging markets: why knowing your lender matters more than fundamentals. Journal of International Economics 119, 133–149.

Cerutti, E., Claessens, S., Ratnovski, L., 2017. Global liquidity and cross-border bank flows. Economic Policy 32, 81–125.

Cerutti, E., Correa, R., Fiorentino, E., Segalla, E., 2016. Changes in prudential policy instruments—a new cross-country database. Working Paper 2016/110. International Monetary Fund. doi:10.5089/9781475574517.001.

Cesa-Bianchi, A., Ferrero, A., Rebucci, A., 2018. International credit supply shocks. Journal of International Economics 112, 219–237.

Cesa-Bianchi, A., Kumhof, M., Sokol, A., Thwaites, G., 2019a. Towards a new monetary theory of exchange rate determination. Staff Working Paper 817. Bank of England.

Cesa-Bianchi, A., Martin, F., Thwaites, G., 2019b. Foreign booms, domestic busts: The global dimension of banking crises. Journal of Financial Intermediation 37, 58–74.

Cetorelli, N., Goldberg, L., 2011. Global banks and international shock transmission: Evidence from the crisis. IMF Economic Review 59, 41–76.

Cetorelli, N., Goldberg, L., 2012. Banking globalization and monetary transmission. The Journal of Finance 67, 1811–1843. doi:10.1111/j.1540-6261.2012.01773.x.

Claessens, S., 2017. Global banking: Recent developments and insights from research. Review of Finance 21, 1513–1555.

Claessens, S., Van Horen, N., 2014. Foreign banks: Trends and impact. Journal of Money, Credit and Banking 46, 295–326.

Cohen, B., Domanski, D., Fender, I., Shin, H., 2017. Global liquidity: a selective review. Annual Review of Economics 9, 587–612.

Coimbra, N., Rey, H., 2024. Financial cycles with heterogeneous intermediaries. Review of Economic Studies 91, 817–857.

Correa, R., DeMarco, L., 2025. Dealer leverage and exchange rates: Heterogeneity across intermediaries. Journal of Banking & Finance 174, 107400.

Correa, R., Du, W., Liao, G., 2025. U.S. banks and global liquidity. Journal of Political Economy Macroeconomics 3, 574–620. doi:10.1086/738383.

Damar, H., Meh, C., Terajima, Y., 2013. Leverage, balance-sheet size and wholesale funding. Journal of Financial Intermediation 22, 639–662.

Danielsson, J., Shin, H., Zigrand, J., 2012. Procyclical leverage and endogenous risk. Available at SSRN 1360866 .

d'Avino, C., Shabani, M., 2025. Spatial dependence via the internal capital markets of US global banks. Journal of Money, Credit and Banking 57, 69–105.

De Haas, R., Van Lelyveld, I., 2014. Multinational banks and the global financial crisis: Weathering the perfect storm? Journal of Money, Credit and Banking 46, 333–364.

Dell'Ariccia, G., Laeven, L., Marquez, R., 2014. Real interest rates, leverage, and bank risk-taking. Journal of Economic Theory 149, 65–99.

Devereux, M., Yetman, J., 2010. Leverage constraints and the international transmission of shocks. Journal of Money, Credit and Banking 42, 71–105.

Egger, P., Li, J., Zhu, J., 2023. The network and own effects of global-systemically-important-bank designations. Journal of International Money and Finance 136, 102879.

Engel, C., Wu, S., 2024. Exchange Rate Models are Better than You Think, and Why They Didn't Work in the Old Days. Working Paper 32808. National Bureau of Economic Research. doi:10.3386/w32808.

Fernández, A., Klein, M., Rebucci, A., Schindler, M., Uribe, M., 2016. Capital control measures: A new dataset. IMF Economic Review 64, 548–574.

Fontaine, J.S., Garcia, R., Gungor, S., 2025. Intermediary leverage shocks and funding conditions. The Journal of Finance 80, 57–99. doi:10.1111/jofi.13407.

Gabaix, X., 2011. The granular origins of aggregate fluctuations. Econometrica 79, 733–772. doi:10.3982/ECTA8769.

Gabaix, X., Koijen, R., 2022. In search of the origins of financial fluctuations: The inelastic markets hypothesis. The Journal of Finance 77, 2274–2303.

Gabaix, X., Koijen, R., 2024. Granular instrumental variables. Journal of Political Economy 132, 2274–2303.

Gabaix, X., Maggiori, M., 2015. International liquidity and exchange rate dynamics. The Quarterly Journal of Economics 130, 1369–1420.

Giraldo, C., Giraldo, I., Gomez-Gonzalez, J., Uribe, J., 2025. US monetary policy shocks and bank lending in latin america: evidence of an international bank lending channel. Applied Economics Letters 32, 1946–1950.

Goldberg, L., 2024. Global liquidity: Drivers, volatility and toolkits. IMF Economic Review 72, 1–31.

Goldberg, L., Krogstrup, S., 2023. International capital flow pressures and global factors. Journal of International Economics 146, 103749.

Gropp, R., Heider, F., 2010. The determinants of bank capital structure. Review of Finance 14, 587–622.

Grossman, V., Mack, A., Martinez-Garcia, E., 2014. A new database of global economic indicators. Journal of Economic and Social Measurement 39, 163–197.

Habib, M.M., Venditti, F., 2019. The global capital flows cycle: structural drivers and transmission channels. Working Paper 2280. European Central Bank. URL: `https://www.ecb.europa.eu/pub/pdf/scpwps/ecb.wp2280~2e76974901.en.pdf`.

He, Z., Kelly, B., Manela, A., 2017. Intermediary asset pricing: New evidence from many asset classes. Journal of Financial Economics 126, 1–35.

Holm-Hadulla, F., Thürwächter, C., 2024. Granular shocks to corporate leverage and the macroeconomic transmission of monetary policy. Working Paper Series 2891. European Central Bank. URL: `https://ideas.repec.org/p/ecb/ecbwps/20242891.html`, doi:`10.2866/300475`. working Paper Series.

Huizinga, H., Laeven, L., 2019. The procyclicality of banking: evidence from the euro area. IMF Economic Review 67, 496–527.

Ilzetzki, E., Reinhart, C., Rogoff, K., 2022. Rethinking exchange rate regimes. volume 6. Elsevier.

Ioannou, S., Wójcik, D., Dymski, G., 2019. Too-big-to-fail: why megabanks have not become smaller since the global financial crisis? Review of Political Economy 31, 356–381.

Itskhoki, O., Mukhin, D., 2021. Exchange rate disconnect in general equilibrium. Journal of Political Economy 129, 2183–2232.

Jordà, O., 2005. Estimation and inference of impulse responses by local projections. American Economic Review 95, 161–182.

Jordà, O., 2023. Local projections for applied economics. Annual Review of Economics 15, 607–631.

Kalemli-Özcan, Ş., 2019. US monetary policy and international risk spillovers. Paper. Jackson Hole Economic Policy Symposium.

Kalemli-Özcan, Ş., Kwak, J., 2020. Capital flows and leverage. Annual Review of Economics 12, 833–846.

Kalemli-Özcan, Ş., Papaioannou, E., Perri, F., 2013. Global banks and crisis transmission. Journal of International Economics 89, 495–510.

Kalemli-Ozcan, S., Sorensen, B., Yesiltas, S., 2012. Leverage across firms, banks, and countries. Journal of International Economics 88, 284–298. doi:10.1016/j.jinteco.2012.03.002.

Kaminsky, G., 2019. Boom-bust capital flow cycles. Working Paper 25890. National Bureau of Economic Research.

Kelly, B., Pruitt, S., Su, Y., 2019. Characteristics are covariances: A unified model of risk and return. Journal of Financial Economics 134, 501–524.

Kelly, B., Pruitt, S., Su, Y., 2020. Instrumented principal component analysis. Available at SSRN 2983919 .

Kim, S., Shin, H., 2021. Offshore eme bond issuance and the transmission channels of global liquidity. Journal of International Money and Finance 112, 102336.

Koepke, R., 2019. What drives capital flows to emerging markets? a survey of the empirical literature. Journal of Economic Surveys 33, 516–540.

Kohler, K., 2022. Capital flows and geographically uneven economic dynamics: A monetary perspective. Environment and Planning A: Economy and Space 54, 1510–1531. URL: https://journals.sagepub.com/doi/abs/10.1177/0308518X221120823, doi:10.1177/0308518x221120823.

Kohler, K., Bonizzi, B., Kaltenbrunner, A., 2023. Global financial uncertainty shocks and external monetary vulnerability: The role of dominance, exposure, and history. Journal of International Financial Markets, Institutions and Money 88, 101818.

Kumhof, M., Rungcharoenkitkul, P., Sokol, A., 2020. How does international capital flow? Working Paper 890. Bank for International Settlements.

Laeven, L., Ratnovski, L., Tong, H., 2016. Bank size, capital, and systemic risk: Some international evidence. Journal of Banking & Finance 69, S25–S34.

Lane, P., Milesi-Ferretti, G., 2018. The external wealth of nations revisited: international financial integration in the aftermath of the global financial crisis. IMF Economic Review 66, 189–222.

Lee, C., Lee, C., Zeng, J., Hsu, Y., 2017. Peer bank behavior, economic policy uncertainty, and leverage decision of financial institutions. Journal of Financial Stability 30, 79–91.

Lee, S., Bowdler, C., 2020. US monetary policy and global banking flows. Journal of International Money and Finance 103, 102118.

Lee, S., Liu, L., Stebunovs, V., 2022. Risk-taking spillovers of US monetary policy in the global market for US dollar corporate loans. Journal of Banking & Finance 138, 105550.

Mandalinci, Z., Mumtaz, H., 2019. Global economic divergence and portfolio capital flows to emerging markets. Journal of Money, Credit and Banking 51, 1713–1730.

McGuire, P., von Peter, G., Zhu, S., 2024. International finance through the lens of BIS statistics: the global reach of currencies. BIS Quarterly Review , June.

McLemore, P., Mihov, A., Sanz, L., 2022. Global banks and systemic risk: The dark side of country financial connectedness. Journal of International Money and Finance 129, 102734.

Michell, J., 2024. Theorising non-bank financial intermediation. Review of Keynesian Economics 12, 181–196.

Minsky, H., 1977. The financial instability hypothesis: An interpretation of keynes and an alternative to "standard" theory. Challenge 20, 20–27.

Miranda-Agrippino, S., Rey, H., 2020. US monetary policy and the global financial cycle. The Review of Economic Studies 87, 2754–2776.

Miranda-Agrippino, S., Rey, H., 2022. The global financial cycle, in: Gopinath, G., Helpman, E., Rogoff, K. (Eds.), Handbook of International Economics. Elsevier, Amsterdam. volume 6, pp. 1–43.

Morelli, J., Ottonello, P., Perez, D., 2022. Global banks and systemic debt crises. Econometrica 90, 749–798.

Nikolaidi, M., 2014. Margins of safety and instability in a macrodynamic model with minskyan insights. Structural Change and Economic Dynamics 31, 1–16.

Nuño, G., Thomas, C., 2017. Bank leverage cycles. American Economic Journal: Macroeconomics 9, 32–72. doi:10.1257/mac.20140084.

Obstfeld, M., Zhou, H., 2022. The global dollar cycle. Brookings Papers on Economic Activity Fall 2022, 361–427.

Oskolkov, A., 2024. Heterogeneous impact of the global financial cycle. Thesis. University of Chicago.

Oskolkov, A., 2025. Value-at-risk constraints, robustness, and aggregation. Available at SSRN 5072989 .

Pedrono, J., 2022. The currency channel of the global bank leverage cycle. Journal of International Money and Finance 126, 102652. doi:10.1016/j.jimonfin.2022.102652.

Petersen, M., 2008. Estimating standard errors in finance panel data sets: Comparing approaches. The Review of Financial Studies 22, 435–480.

Raddatz, C., Seneviratne, D., Vandenbussche, M., Xie, P., Xu, Y., 2024. The Riskiness of Credit Origins and Downside Risks to Economic Activity. Working Paper 2024/072. International Monetary Fund.

Rey, H., 2015. Dilemma not Trilemma: The Global Financial Cycle and Monetary Policy Independence. Working Paper 21162. National Bureau of Economic Research.

Rogers, J., Sun, B., Wu, W., 2025. Drivers of the global financial cycle. Journal of International Economics 156, 104088.

Scheubel, B., Stracca, L., Tille, C., 2025. The global financial cycle and capital flows: Taking stock. Journal of Economic Surveys 39, 779–805.

Schoenmaker, D., 2017. What happened to global banking after the crisis? Journal of Financial Regulation and Compliance 25, 241–252.

Sissoko, C., 2025. Banks are different: why bank-based versus market-based lending is a false dichotomy. European Journal of Economics and Economic Policies: Intervention 22, 32–53.

Takáts, E., Temesvary, J., 2021. How does the interaction of macroprudential and monetary policies affect cross-border bank lending? Journal of International Economics 132, 103521.

Wu, J.C., Xia, F.D., 2016. Measuring the macroeconomic impact of monetary policy at the zero lower bound. Journal of Money, Credit and Banking 48, 253–291.

A Appendix

A.1 Data

Table 8: Summary country statistics for quarterly exchange rate depreciations, EMBI spreads and gross inflows over GDP

Country	Exchange Rate		EMBI spread		Gross inflows	
	Mean	**Std**	**Mean**	**Std.**	**Mean**	**Std.**
AGO	9.72	17.33	732.45	236.30	-3.90	34.16
ARG	11.43	21.25	1352.79	1161.44	16.69	18.86
AUS	-0.15	8.79	-	-	32.61	39.63
AUT	-	-	-	-	26.36	83.13
BEL	-	-	-	-	86.80	150.91
BGR	-0.21	6.81	220.02	142.14	59.79	74.91
BOL	0.29	1.81	610.94	291.62	22.08	37.88
BRA	2.32	13.40	379.74	265.09	20.81	17.20
BRN	-0.51	3.71	-	-	12.89	27.67
CAN	-0.14	6.15	-	-	49.90	22.89
CHE	-1.25	5.82	-	-	46.41	139.25
CHL	1.02	8.54	153.98	48.09	33.91	26.49
CHN	-0.39	2.92	150.06	60.49	23.16	16.92
COL	1.96	9.40	-	-	31.95	15.60
CRI	1.39	4.26	358.51	113.48	41.25	19.12
CYP	-2.41	6.29	-	-	449.47	684.63
CZE	-1.10	8.72	-	-	38.54	43.62
DEU	-	-	-	-	40.96	45.48
DNK	-0.20	6.79	-	-	40.56	67.87
DOM	2.72	10.52	467.13	254.39	32.58	15.62
ECU	-10.78	103.38	1031.74	659.11	16.87	25.83
EGY	4.55	12.77	395.86	240.36	31.81	23.89
ESP	-	-	-	-	65.47	49.87
FIN	-	-	-	-	-17.75	176.97
FRA	-	-	-	-	76.35	75.11
GBR	0.59	7.13	-	-	90.52	144.73
GEO	0.67	6.46	453.55	241.58	76.20	39.35
GHA	6.98	9.68	552.93	384.56	33.53	22.16
GRC	6.77	2.86	-	-	55.14	70.78
GTM	0.02	2.12	955.25	832.19	19.01	14.76

Table 8: (continued)

Country	Exchange Rate		EMBI spread		Gross inflows	
	Mean	**Std**	**Mean**	**Std.**	**Mean**	**Std.**
HKG	0.01	0.30	302.60	165.70	193.35	236.09
HUN	0.71	9.89	-	-	80.22	212.74
IDN	1.61	7.61	249.03	97.31	12.54	15.49
IND	1.39	4.97	249.93	78.80	27.96	11.73
IRL	-	-	-	-	489.18	451.84
ISL	1.40	10.25	-	-	129.89	347.30
ISR	-0.30	5.78	-	-	30.60	22.89
ITA	-	-	-	-	30.95	30.38
JAM	2.79	3.87	433.75	129.52	35.51	26.55
JPN	0.54	7.46	-	-	-10.61	23.02
KEN	1.19	5.28	368.29	153.34	-	-
KOR	0.29	6.60	-	-	15.02	15.91
LKA	3.56	8.31	682.41	947.83	19.88	16.59
LVA	-0.47	5.90	-	-	63.28	84.87
MDA	0.96	5.95	-	-	51.57	37.96
MEX	1.51	7.42	248.87	89.59	16.65	14.03
MLT	-2.22	5.40	-	-	665.20	1019.76
MUS	1.23	5.63	-	-	446.14	853.55
MYS	0.32	4.93	161.94	57.90	27.47	41.87
NGA	3.34	7.59	423.48	299.17	9.83	15.24
NIC	2.33	0.52	-	-	37.87	55.20
NLD	-	-	-	-	136.60	213.81
NOR	0.45	8.72	-	-	61.50	66.47
NZL	-0.46	8.95	-	-	23.00	30.96
PAK	3.45	6.14	682.86	470.30	11.66	12.30
PAN	0.00	0.00	238.71	103.52	81.86	81.04
PER	0.17	4.16	257.18	161.23	30.22	21.43
PHL	0.67	4.69	246.83	155.13	13.67	16.46
POL	0.10	9.85	115.32	70.81	33.00	25.26
PRT	-	-	-	-	58.22	68.98
PRY	1.64	8.67	243.92	30.86	10.15	13.44
QAT	0.00	0.00	-	-	29.90	70.39
ROU	1.93	8.11	225.61	77.95	40.23	39.03
RUS	2.12	12.43	454.22	638.45	12.93	31.06

Table 8: (continued)

Country	Exchange Rate		EMBI spread		Gross inflows	
	Mean	**Std**	**Mean**	**Std.**	**Mean**	**Std.**
SAU	0.00	0.00	-	-	15.79	17.37
SGP	-0.51	3.73	-	-	220.84	211.29
SLV	-4.72	31.81	500.14	396.14	27.70	25.80
SVN	-0.70	7.15	-	-	38.25	51.50
SWE	0.41	8.42	-	-	43.44	56.32
THA	-0.20	4.86	-	-	12.19	25.55
TUR	7.64	14.51	397.31	186.81	27.48	19.60
UGA	1.97	7.03	-	-	25.90	42.05
UKR	4.19	12.22	928.03	887.60	49.31	48.74
URY	2.63	10.40	398.00	491.12	36.25	42.69
VNM	1.13	1.75	5090.97	10021.09	38.66	16.99
ZAF	2.19	11.83	260.06	111.57	10.42	24.22
ZMB	4.31	14.98	753.51	1024.56	37.63	54.39

Table 8: Summary country statistics for quarterly exchange rate depreciations, EMBI spreads and gross inflows over GDP

	Leverage	z_t	ln (VIX)	Federal Funds rate	World GDP	US GDP	Shadow Rate	BRW
Leverage	1.0							
z_t	0.33 ***	1.0						
ln (VIX)	0.14	-0.07	1.0					
Federal Funds rate	-0.12	0.08	-0.34 ***	1.0				
World GDP	-0.0	0.02	-0.27 **	0.19 *	1.0			
US GDP	-0.07	0.01	-0.31 ***	0.17 *	0.91 ***	1.0		
Shadow Rate	0.45 ***	-0.03	-0.03	0.04	0.02	-0.03	1.0	
BRW	0.01	0.03	-0.01	-0.07	0.06	-0.02	-0.04	1.0

Table 9: Pairwise correlations

Dependent	Horizon Variable	1	2	3	4	5	6	7	8	9	10	11
EMBI spread	z_t	−4.32	−12.46 **	−21.32 ***	−29.43 ***	−18.86 ***	−11.09 **	−10.77 *	−13.7 *	−29.3 ***	−15.9 ***	−4.52
	z_t lag (1)	−6.41	−13.92 **	−13.22 *	−0.81	2.09	−4.38	−9.91	−26.66 ***	−18.55 ***	−18.34 ***	1.91
	Latent 1	9.57	−5.32	−26.06 ***	−35.89 ***	−31.83 ***	−28.16 ***	−18.24 **	−16.17 *	−22.85 **	−20.76 **	−17.95 *
	Latent 2	3.06	0.29	4.19	−5.63	−29.66 *	−47.93 **	−50.46 **	−53.62 ***	−69.65 ***	−84.64 ***	−82.08 ***
	Latent 3	−41.43 ***	−43.83 ***	−43.32 ***	−39.64 ***	−33.09 ***	−27.4 **	−13.22	−2.92	−1.63	3.15	4.91
	ln.VIX	39.3 ***	35.52***	25.33***	10.58	9.17	27.75***	20.79**	30.66**	47.71**	40.3 **	−3.46
	FF rate	63.8 *	82.6 **	−27.51	−125.68 **	−123.31 **	−31.05	−28.26	−6.01	42.93*	4.44	−59.55
	GDP growth World	−65.47 **	−70.72 ***	−54.71 *	−21.72	0.13	42.8	83.78**	117.79 ***	131.14 ***	93.42***	9.1
	GDP growth US	30.04*	42.41**	30.16*	13.41	13.03	−13.3	−45.76 **	−77.28 ***	−95.84 ***	−64.75 **	−42.88 *
	Domestic credit	−1.82	−2.52	−3.75	−1.85	−0.51	−1.25	−1.67	−1.17	−2.15	−4.09	−4.5
	GDP growth	−0.02 **	−0.03 ***	−0.03 ***	−0.04 ***	−0.05 ***	−0.05 ***	−0.05 ***	−0.05 ***	−0.06 ***	−0.06 ***	−0.06 ***
	Inflation	34.78**	39.63**	33.48**	20.44**	7.98	−1.17	−6.69	−12.03 *	−13.25	−12.29	−12.06
	Deposit rate epol	−1.69	−0.76	0.5	0.79	1.2	2.33	3.21	3.45	3.8	3.91	6.12*
	kai	−129.3 *	−150.09 *	−110.89	−54.58	−26.15	−30.88	−31.21	−54.73	−76.71	−85.34	−85.98
	FX Regime	1.06	−3.87	−2.55	−2.06	−17.73	−34.08	−41.02	−36.89	−34.97	−32.67	−25.76
	Constant	120.51 ***	190.14 ***	219.91 ***	237.42 ***	291.27 ***	361.09 ***	394.84 ***	417.11 ***	444.49 ***	457.82 ***	438.85 ***
	EMBI spread lag (1)	0.72***	0.56***	0.45*	0.37	0.34	0.28	0.24	0.19	0.14	0.1	0.02
	R2	0.54	0.32	0.20	0.13	0.09	0.07	0.05	0.05	0.05	0.05	0.07
	Observations	2566	2533	2500	2467	2434	2401	2368	2335	2302	2269	2236
	Countries	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0
Exchange Rate	z_t	0.16	−0.73 **	−1.3 ***	−1.64 ***	−1.63 ***	−1.53 ***	−1.46 ***	−1.73 ***	−2.02 ***	−2.05 ***	−1.79 ***
	z_t lag (1)	−1.04 ***	−1.36 ***	−1.59 ***	−1.56 ***	−1.47 ***	−1.53 ***	−1.61 ***	−1.97 ***	−2.0 ***	−1.83 ***	−1.69 ***
	Latent 1	1.28***	0.81***	0.24	0.28	0.31	0.75**	0.48	0.71**	0.65**	0.53*	1.21***
	Latent 2	1.47***	2.02***	2.13***	1.67**	1.98**	2.22**	3.09***	3.48***	3.4***	3.05***	3.59***
	Latent 3	−0.76 ***	−0.8 ***	−1.32 ***	−1.37 ***	−1.33 ***	−1.48 ***	−0.9 ***	−0.78 ***	−0.33	−0.08	−0.23
	ln.VIX	−0.11	−0.17	−0.49	−0.67 **	−0.79 **	−1.22 ***	−1.72 ***	−2.1 ***	−2.46 ***	−2.36 ***	−2.81 ***
	FF rate	1.18	0.83	1.05	0.37	1.07	1.58	0.17	0.21	−1.73	−1.18	−1.31
	GDP growth World	−4.16 ***	−5.4 ***	−5.68 ***	−5.08 ***	−5.77 ***	−5.47 ***	−5.97 ***	−6.09 ***	−6.26 ***	−6.57 ***	−6.8 ***
	GDP growth US	3.08***	4.39***	4.26***	4.01***	4.46***	4.08***	4.46***	4.49***	4.16***	4.76***	4.91***
	Domestic credit	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	GDP growth	0.0***	0.0***	0.0***	0.0***	0.0***	0.0*	0.0***	0.0	0.0*	0.0	0.0
	Inflation	0.38**	0.31	0.22	0.14	0.04	−0.06	−0.22	−0.5	−0.51	−0.5	−0.66
	Deposit rate epol	0.15**	0.23***	0.27***	0.25**	0.28**	0.31**	0.33**	0.34*	0.27	0.18	0.16
	kai	0.41	0.51	1.67	2.26	2.85	3.46	3.71	3.37	2.69	2.38	2.77
	FX Regime	0.54	0.57	0.57	0.72	0.67	0.55	0.51	0.47	0.31	0.37	0.64
	Constant	−1.76	−1.75	−1.79	−1.63	−1.33	−0.78	−0.37	0.44	1.78	2.64	2.49
	Exchange Rate lag (1)	0.0	0.0	0.0	0.0	0.0	0.0	−0.01	−0.02	−0.03	−0.02	−0.03 *
	R2	0.05	0.05	0.05	0.05	0.04	0.04	0.04	0.05	0.05	0.05	0.04
	Observations	4500	4494	4488	4481	4462	4401	4340	4279	4218	4157	4096
	Countries	65.0	65.0	65.0	64.0	64.0	64.0	64.0	64.0	64.0	64.0	64.0
Gross inflows	z_t	9.11**	13.54**	20.04**	28.89***	34.32**	37.28**	42.85**	51.39**	59.56**	65.39**	73.29**
	z_t lag (1)	10.22*	17.17**	25.17**	31.78**	34.99**	41.74**	49.21**	58.52**	64.67**	73.75**	82.37**
	Latent 1	−12.29 *	−17.67	−19.19	−24.0 *	−26.27 *	−34.37 **	−38.57 **	−48.58 **	−51.58 **	−57.98 ***	−60.61 **
	Latent 2	−38.26 ***	−59.79 ***	−77.86 ***	−96.44 ***	−110.98 ***	−130.63 ***	−142.32 ***	−154.42 ***	−158.84 ***	−163.64 ***	−165.17 ***
	Latent 3	4.91	3.11	6.37	9.85*	7.04	0.33	−2.14	−6.49	−10.96	−18.08	−25.45
	ln.VIX	−7.44 **	−9.7 *	−11.46 *	−11.9	−13.54	−6.27	0.55	5.16	7.54	14.04	19.63
	FF rate	−53.19 ***	−67.24 ***	−63.24 ***	−65.12 **	−42.06	3.03	68.93	101.7	134.16	159.05	199.86 *
	GDP growth World	84.83***	134.73 ***	176.48 ***	218.16 ***	236.17 ***	264.48 ***	274.1 ***	292.15 ***	291.13 ***	288.74 ***	273.71 **
	GDP growth US	−62.63 ***	−98.73 ***	−129.04 ***	−161.04 ***	−175.58 ***	−194.22 ***	−199.74 ***	−214.48 ***	−212.85 ***	−204.95 **	−192.65 **
	Domestic credit	0.05	0.07	0.1	0.13	0.15	0.18	0.2	0.22	0.24	0.26	0.28
	GDP growth	0.0	−0.01 **	0.0	−0.01	−0.01	−0.01	−0.01	−0.02	−0.01	−0.02	−0.02
	Inflation	5.03**	6.32*	9.41**	10.71*	12.48*	15.13*	22.58**	25.76**	28.67**	30.27**	36.26**
	Deposit rate epol	−3.44	−5.57	−8.04	−10.9	−13.34	−15.99	−18.82	−21.45	−23.49	−25.47	−27.5
	kai	−214.52 **	−315.29 **	−408.98 **	−491.96 **	−581.41 **	−666.36 **	−747.5 **	−815.53 *	−877.73 *	−929.43	−974.86
	FX Regime	16.77	29.11	45.41	63.24	82.12	99.69	116.57	134.67	155.15	175.06	194.44
	Constant	100.75 ***	145.78 **	179.08 **	213.16 *	245.12	283.22	315.58	347.63	368.84	392.39	410.16
	Gross inflows lag (1)	0.0***	0.0***	0.0***	0.0***	0.0***	0.0***	0.0***	0.0***	0.0***	0.0***	0.0***
	R2	0.05	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
	Observations	5450	5447	5444	5438	5370	5299	5228	5157	5086	5015	4944
	Countries	74.0	74.0	74.0	74.0	74.0	74.0	74.0	74.0	74.0	74.0	74.0

Table 10: Cumulative causal effect of global banks' leverage on EMBI spreads, exchange rate depreciations and gross cross-border inflows. Note: Panel local projections with country fixed effects. Significance levels: *** p<1%, ** p<5%, * p<10%

A.2 Figures

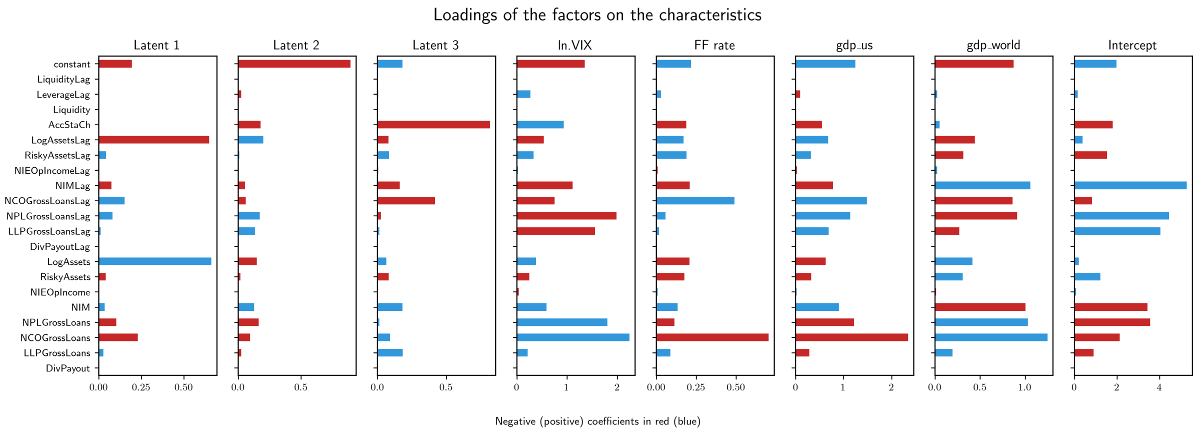

Figure 5: Loadings of factors on characteristics. Note: Negative (positive) coefficients in red (blue).

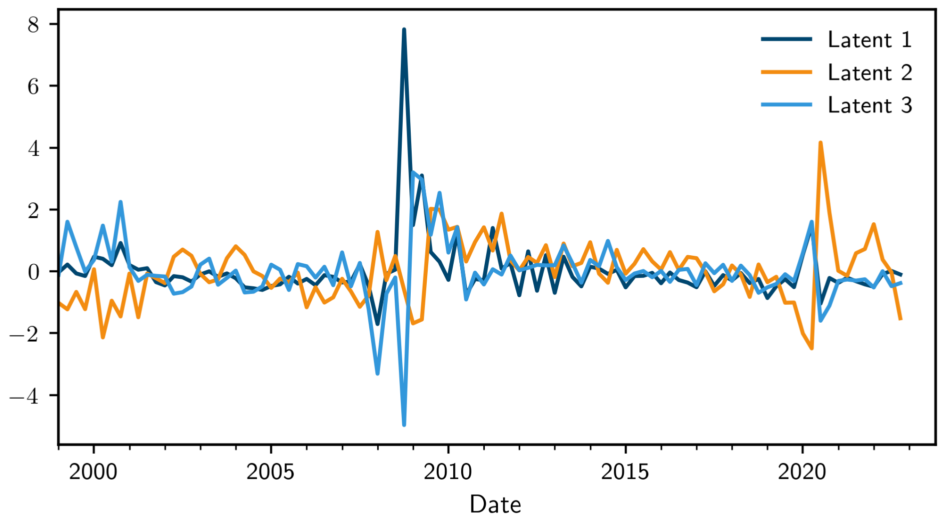

Figure 6: Estimated latent factors

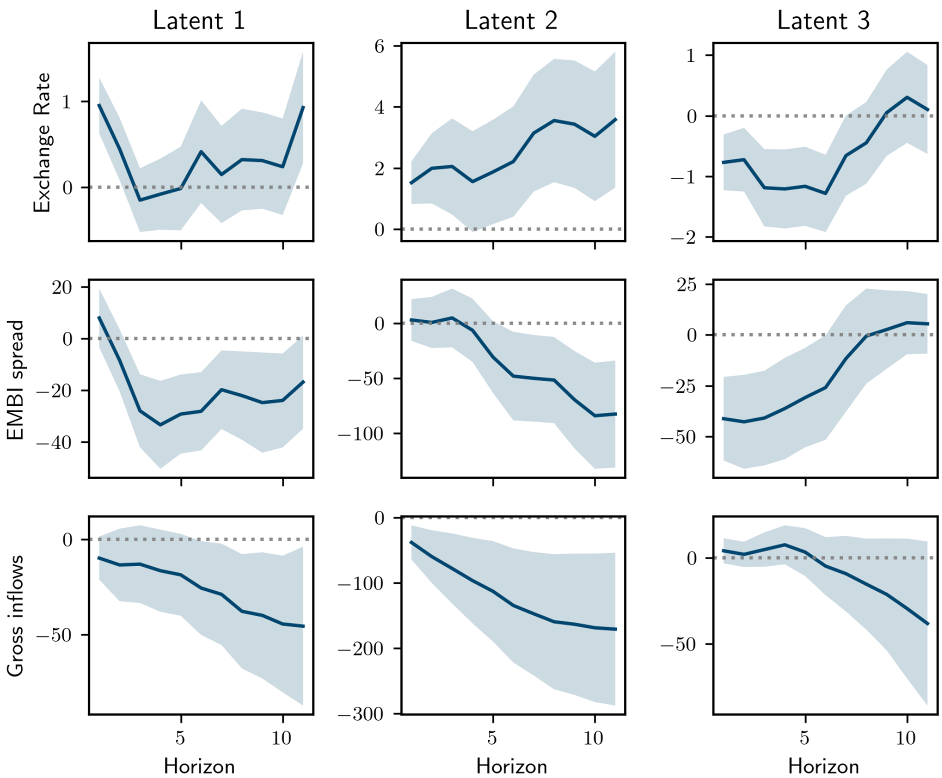

Figure 7: Cumulative effect of the estimated latent factors, EMBI spreads, exchange rate depreciations and gross cross-border inflows. Excluding the GIV from the regression. Note: The figure shows the cumulative impulse average responses in each country. The areas denote the 95 per cent confidence interval.