

Drivers of Exchange Rates in EMDEs: Implications for Foreign Exchange Intervention

Prepared by Ece Ozge Emeksiz, Andrés Fernández, Nikhil Patel,
Ivan Petrella, and Tatjana Schulze

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Implications for Foreign Exchange Intervention****Prepared by Ece Ozge Emeksiz, Andrés Fernández, Nikhil Patel, Ivan Petrella, and Tatjana Schulze***Authorized for distribution by Tobias Adrian and Giovanni Dell'Ariccia
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ABSTRACT: Exchange rate movements in emerging markets and developing economies (EMDEs) can reflect shifts in macroeconomic fundamentals or financial shocks that impair currency market functioning. Distinguishing between these fundamental and nonfundamental drivers is central to the IMF's Integrated Policy Framework (IPF) and to assessing when foreign exchange (FX) intervention may be appropriate to smooth currency risk premia. This Staff Discussion Note develops an empirical framework to distinguish between these two types of drivers using deviations from uncovered interest parity (UIP), which capture currency risk premia and limits to arbitrage. Using 15 years of monthly data from 25 EMDEs, the paper documents stylized facts on UIP premia and introduces a toolkit that combines macrofinancial data, model-based sign restrictions, and narrative evidence to identify episodes in which exchange rate movements are driven by financial shocks rather than fundamentals. Applications to Chile and Brazil show that such financial shock-driven episodes account for around one-third of UIP premium fluctuations—but are associated with sizable contractions in economic activity. The framework can be applied both retrospectively and in real time, providing policymakers with a structured approach to interpreting exchange rate pressures.

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Contents

Executive Summary	4
I. Introduction	6
II. What Motivates the Decision to Intervene? Theory and Practice	9
III. UIP Premia across Countries and over Time	11
IV. Understanding the Anatomy of a Financial Shock: A Case Study from Chile.....	16
V. Systematically Breaking Down UIP Premia into Frictions Versus Fundamentals	20
A. Choice of Variables Used in the Toolkit	21
B. Applying the Toolkit: The Case of Chile	22
C. Applying the Toolkit to Compare Brazil and Chile.....	25
VI. Using the Toolkit for Real-Time Inference.....	27
A. A Real-Time Read on June 2022	27
B. A Falsification Test: May 2023	28
VII. Conclusion and Policy Implications	30
Annex 1. UIP Correlations	32
Annex 2. Simulation Results to Motivate Sign Restrictions for the VAR	33
Annex 3. Additional VAR Results	40
3.1 Propagation of Financial Shock with and without Narrative Restrictions	40
3.2 Robustness of Baseline Results for Brazil Using the CIP Measure of Dao and Gourinchas (2026)	40
References	42

Executive Summary

Determining when to intervene in foreign exchange (FX) markets remains a major policy challenge for central banks in EMDEs, particularly amid heightened global volatility. Under the IMF's Integrated Policy Framework (IPF), FX intervention (FXI) may be warranted in three cases: smoothing destabilizing risk premia, addressing financial stability risks from FX mismatches, and supporting price stability. This Staff Discussion Note (SDN) focuses on the first case—smoothing large changes in hedging and financing premia that can threaten macroeconomic and financial stability, even when domestic policy settings are appropriate. A key consideration for policymakers in this context is distinguishing exchange rate movements driven by shifts in macroeconomic fundamentals from those reflecting changes in financial conditions that affect currency risk premia and market functioning. This distinction is critical for policy strategy: in the former case, exchange rates should typically be allowed to adjust to facilitate macroeconomic adjustment, while FX intervention may potentially be justified in the latter case.

This SDN builds on the IPF by providing an empirical framework for analyzing exchange rate movements in emerging markets and developing economies (EMDEs), with particular attention to financial shocks and their implications for FXI. Using 15 years of data from 25 EMDEs with mostly flexible exchange rate regimes, it first examines currency fluctuations during shock episodes and cross-country patterns in Uncovered Interest Rate Parity (UIP) premia, which is the difference in the expected returns of investing in two different currencies. It then presents a practical toolkit that combines macrofinancial variables, recent theoretical advancements, and lessons from case studies and market narratives to diagnose the drivers of currency movements. Supporting both retrospective assessment of exchange rate movements and real-time policy analysis, the toolkit helps distinguish exchange rate fluctuations driven by underlying macroeconomic fundamentals from those arising from financial shocks and amplification, providing policymakers with an important input to determine when intervention may be appropriate in the broader context of the IPF.

Financial frictions explain a relatively modest portion of exchange rate and UIP premium fluctuations, implying that most movements reflect underlying fundamentals. Evidence from Chile and Brazil, based on the toolkit, shows that only a third of UIP premia fluctuations are attributable to such frictions. Yet, when these financial shocks occur, they are often accompanied by sharp contractions in economic activity, underscoring the vulnerability of the real economy to financial stress. These findings point to the potential benefits of timely, targeted policy responses during periods of pronounced market disruption.

The framework developed in this note can be applied both retrospectively and, subject to data limitations, in real time. Rather than providing a mechanical rule for FXI, it offers a structured diagnostic to assess whether observed exchange rate pressures are plausibly associated with financial shocks or market dysfunction. This diagnostic is most informative when combined with country-specific judgment and the broader IPF assessment.

This note offers the potential for a practical framework for central banks and policymakers in EMDEs to gain deeper insights into exchange rate dynamics and help inform policy responses. By systematically identifying the factors behind currency movements, the framework introduced in this note can help guide policy decisions that are both more informed and effective, providing an important input into their overall assessment, which entails a broader consideration of factors such as reserve adequacy, effectiveness of interventions, and availability of other policy tools. The note develops a toolkit and illustrates its application on a proof-of-concept basis for Brazil and Chile, two emerging market economies with floating regimes with relatively developed FX markets and rich data, as well as corroborates narrative evidence on select episodes, from both public and

private sources. The challenging task of extending it to other jurisdictions, including those with scarce data and narratives, and less-developed FX markets, would be the next fruitful avenue.

I. Introduction

Amid an uncertain global outlook, central banks in EMDEs have been grappling with the question of when to intervene in FX markets to stabilize the value of their currencies. The IPF outlines three use cases under which FXI may be appropriate: to smooth destabilizing premia (A), to counter risks from FX mismatches (B), and to help preserve price stability—complementing but not substituting for monetary policy—when exchange rate movements risk de-anchoring inflation expectations (C) (Table 1; IMF 2023). This SDN focuses on use case A, where FXI may be appropriate to smooth large changes in hedging and financing premia that pose risks to macroeconomic and financial stability, and that arise even when domestic policy settings are appropriate. Financial shocks manifest in elevated currency hedging and financing premia. Large changes in these premia can hamper market liquidity. At the extreme, illiquid—or “shallow”—currency markets can create adverse spillovers to other market segments and ultimately to economic activity. Distinguishing changes in premia because of financial shocks versus fundamentals is difficult. Yet, doing so is imperative to identify when FXI is appropriate under use case A.

Table 1. Use Cases for FXI under the IPF

	A. FXI to Smooth Destabilizing Premia	B. FXI to Counter Risks from FX Mismatch	C. FXI to Address Risks to Price Stability
Type of shock	Inefficient financing or hedging premia from private capital-flow shocks	Sharp exchange rate depreciation from real or financial shocks	Sharp exchange rate depreciation from real or financial shocks; persistent appreciation
Frictions	Arbitrage frictions from foreign investors' balance sheet constraints	Unhedged FX liabilities in the private sector (firms, financial sector, households)	Nominal frictions that generate nonlinear effects from exchange rate to inflation expectations
Source: IMF Guidance Note on Principles for the Use of “Foreign Exchange Intervention” (Policy Paper No. 2023/061).			

This SDN builds on the IPF by providing an empirical toolkit to support both a historical assessment of exchange rate movements and real-time policy analysis.¹ To assist with the implementation of IMF guidance on FXI, this SDN studies the drivers of exchange rate movements over the past 15 years through the lens of premia to help interpret currency fluctuations during observed shock episodes, drawing on historical country experiences and focusing on EMDEs with mostly flexible exchange rate regimes based on the de facto exchange rate regime classification in the IMF’s AREAER. It then develops a toolkit to determine which premia arise from financial shocks in currency markets and which ones signal the need for macroeconomic adjustments. The toolkit can be used not only to interpret historical movements in exchange rates but also to provide policymakers with a framework for making policy choices in real time.

A key challenge is that currency movements alone do not provide enough information to gauge the extent of distortions in currency markets. The IPF proposes a set of diagnostic tools including arbitrage frictions (for example, CIP deviations) and liquidity stress indicators (for example, FX bid–ask spreads) to evaluate exchange rate movements that result from financial shocks and market frictions as opposed to fundamentals. The key diagnostic tool within this broad set is the UIP premium. It reflects the difference in

¹ See IMF Guidance Note on “Principles for the Use of Foreign Exchange Intervention” (Policy Paper No. 2023/061).

expected returns of investing in two different currencies. For example, for a dollar-based investor, it captures the difference in returns that can be made over the same period from (1) investing the dollar and earning the dollar interest rate and (2) converting the dollar to another currency (for example, peso), investing in the interest rate of that currency, and converting the proceeds back into dollars in the future_FX market (Box 1). They signal when market participants require a higher expected return vis-à-vis other currencies for taking on exchange rate risks, possibly reflecting barriers to currency trades. Such barriers, arising, for example, from illiquid currency markets, are one of the targets of FXI. This SDN therefore focuses on highlighting key trends in UIP premia across countries and uses them to anchor the toolkit built to quantify the drivers of exchange rates.

This SDN complements existing stylized findings on UIP premia focusing on a sample of 25 EMDEs.

Previous work has documented that UIP premia reflect a combination of local and global factors across advanced economies (AEs) and EMDEs: Both the cross-country and the over-time variation in UIP premia in EMDEs are driven primarily by local, country-specific risks—policy uncertainty and sovereign risk—operating mainly through the interest rate differential, even though the premia also co-move with global risk perception (Dao, Itskhoki and Gourinchas 2025; Kalemli-Özcan and Varela 2021). This SDN goes a step further by providing a framework to dissect UIP premia based on their origins in frictional features in FX markets versus changes in macroeconomic fundamentals, both of which can occur because of local or global developments.

A key contribution of this SDN is to introduce an empirical toolkit to decompose exchange rate movements that leverages both macroeconomic and financial data alongside theoretical and narrative insights. The toolkit is built on monthly data covering a range of macrofinancial variables—including interest rate differentials, inflation, exchange rates, capital flows, and measures of market liquidity—allowing for a holistic analysis of the forces at play. Drawing on recent advances in theoretical modeling, as well as lessons from well-documented case studies and market narratives, the toolkit is designed to distinguish between exchange rate fluctuations driven by underlying fundamentals and those arising from financial shocks. This approach can help assess whether exchange rate pressures are plausibly associated with financial frictions relevant for IPF use case A, providing policymakers with a structured input into a broader policy assessment.

A systematic decomposition for Chile and Brazil using this toolkit reveals that only a quarter of the fluctuations in UIP premia are attributable to financial shocks that may justify foreign exchange intervention after IPF use case A. Over long horizons on average, these shocks have a limited effect on broader macroeconomic variables such as output and inflation. However, when they do materialize, they tend to trigger sharp declines in output in response to depreciations, underscoring the strong link between financial market disruptions, exchange rate movements, and real economic activity. This pattern highlights the importance of carefully assessing the appropriate policy response during periods of pronounced financial stress.

The toolkit can also be applied in real time for many countries, providing policymakers with a structured way to update their assessment as new data become available. When used in a real-time setting, the toolkit can help flag episodes in which incoming market data become increasingly consistent with financial stress, while also highlighting cases in which the evidence remains weak or mixed. Results show that during episodes of market calm, the toolkit signals little need for policy action, while in periods of heightened volatility, it can help detect signs of financial disruption—demonstrating its practical value for real-time policy assessment for countries in cases where high-frequency data (for example, bid–ask spreads) are readily available.

The remainder of this SDN is organized as follows. Section II provides an overview of FXI in practice and explains why UIP premia serve as a useful metric. Section III documents patterns in the evolution of UIP premia across EMDEs and over time. Section IV draws lessons from select historical episodes in which

exchange rate movements were primarily driven by either currency market distortions or changes in macroeconomic fundamentals. Section V introduces the empirical toolkit and systematically separates movements in UIP premia into those arising from financial shocks versus fundamentals, using data from the past 15 years across countries. Section VI applies the toolkit in real time, using case studies to demonstrate how policymakers can interpret the drivers of exchange rate movements as shocks unfold. Section VII concludes with a summary of the main results and policy implications.

II. What Motivates the Decision to Intervene? Theory and Practice

Building on the IPF guidance discussed as discussed in the previous section, this section focuses on the case in which FXI may be warranted to smooth sharp changes in hedging and financing premia arising from shallow or temporarily illiquid FX markets (case A, Table 1). Telling apart changes in premia because of financial shocks versus fundamentals is difficult but essential for determining when FXI is appropriate. This note relies on UIP premia as the primary indicator to distinguish fundamental from frictional exchange rate movements, complemented by alternative indicators.

Currency risk premia offer a way to gauge the extent of destabilization in FX markets. The IPF (Basu and others 2020; IMF 2020, 2023; Adrian and others 2021), along with other academic studies (Gabaix and Maggiori 2015; Gourinchas 2022; Itskhoki and Mukhin 2023; Basu and others 2025), proposes to look at currency risk premia to determine when FXI is more appropriate than solely relying on the traditional monetary policy toolkit and other regulatory policies. Currency risk premia compensate investors for uncertainty related to changes in exchange rates between currencies. One frequently studied example is the UIP premium, which this SDN mainly focuses on.

Imbalances in relative returns on currencies because of FX market frictions are visible in UIP premia. UIP premia arise when one currency's value is expected to change relative to that of another by an amount that diverges from the relative interest rates on the currencies (Box 1). Under these circumstances, the expected return on the currencies differs when converted into a common currency, reflecting a risk premium. This can happen when currency markets are “shallow,” that is, not sufficiently liquid, and feature additional transaction costs, making it harder for financial intermediaries to broker currency trades. In such instances, investors may demand higher compensation for uncertainty.² Hence, premia may indicate some impairment in market functioning and call for central banks to temporarily step in with FXI to provide liquidity if sufficiently severe.

Central bank interventions often occur around spikes in UIP premia, but not all UIP spikes warrant FXI. Some may well be driven by fundamental forces such as changes in fiscal stance or terms of trade movements, including those driven by energy prices. While UIP premia are still scarcely monitored in practice by central banks, they display a positive correlation with FXI (sales) in the data (see Figure 4 in Section III). This suggests that UIP premia are indeed indicative of episodes of large currency movements that prompt intervention to limit the extent of the depreciation, particularly in times of stress. However, it does not indicate to what extent FXI directly or indirectly responded to the frictions versus shifts in fundamentals (Section V).

Beyond UIP premia, covered interest rate parity (CIP) premia and FX bid–ask spreads provide additional information to policymakers about potentially destabilizing currency movements (IMF 2023).

Demand and supply imbalances in FX markets may reflect differences in market participants' expectations about future exchange rate movements—captured in UIP premia—but they may also reflect imbalances in the FX forward market, where agents try to hedge their FX risk exposure. The banks that intermediate currency trades have limited capacity. More exposure to currency risk (that is, “unhedged” exposure) raises risks and creates possible losses. More off-balance sheet exposure (through forwards/swaps) also carries counterparty or funding risk. To accept this increase in risks, banks demand compensation. These demands show up in CIP

² Temporarily large uncovered interest parity (UIP) premia can emerge even when currency markets are usually deep. They can also emerge even when market participants try to hedge their exposure to the exchange rate risk using financial derivatives.

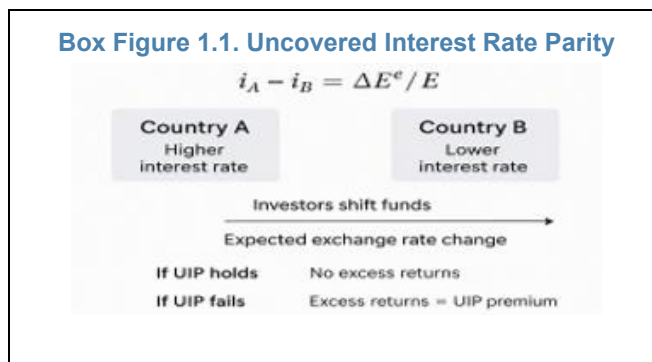
premia. Beyond UIP and CIP premia, another concept of “premia” or “spreads” is the difference between a currency’s bid price (of the buyer) and ask price (of the seller). A widening FX bid–ask spread in spot and swap markets can indicate when markets have a difficult time clearing because of imbalanced currency demand and supply, and when market liquidity quickly dries up. This note focuses on UIP premia as the main barometer to dissect fundamental from frictional exchange rate movements, supplemented by these alternative indicators.

Box 1. Uncovered Interest Rate Parity (UIP): A Primer

UIP is a relationship that provides a benchmark for how exchange rates between currencies might move over time. UIP states that the *difference in interest rates* between two countries should equal the *expected change in the exchange rate* between their currencies.

UIP in theory. Consider two countries, Countries A and B, each with their own interest rate and currency. Let Country A offer a higher interest rate than Country B. Then, its currency should depreciate against Country B over time. This ensures that investors are incentivized to continue to invest in Country B despite its lower interest rate. Otherwise, investors could make an expected profit: they could convert their currency from Country B to Country A at the prevailing exchange rate, invest at the higher interest rate in Country A, and expect to convert their investment back to Country B at the future expected exchange rate. This strategy would still be expected to earn more than the alternative strategy of investing directly at a lower interest rate in Country B (though it does entail taking on exchange rate risk).

Box Figure 1.1. Uncovered Interest Rate Parity



UIP in practice. While UIP is an important benchmark, it rarely holds in practice. Rather, investors can expect to earn excess returns from investing in one currency vis-à-vis another, the so-called “UIP premia.” For example, investors expect the EMDE currency to weaken, but EMDE assets still have to pay an additional premium—above and beyond that expected loss—to compensate for additional risk. The main factors that drive UIP premia relate to the risk of holding one currency versus another, differences in expectations of future exchange rates among market participants, transaction costs associated with exchanging currencies, and behavioral biases among market participants (Stavrakeva and Tang 2020, 2024; Kalemli-Ozcan and Varela 2021). Changes in UIP premia over time often indicate constraints on financial intermediaries and their ability to absorb currency risk, which provides a rationale for central bank interventions (see, for instance, Basu and others 2020; Itskhoki and Mukhin 2023).

Covered interest rate parity (CIP). A closely related benchmark is CIP. The key difference from UIP is that CIP removes exchange rate uncertainty: rather than relying on the expected future exchange rate, the investor locks in the future rate today through a forward contract. CIP then states that the interest rate differential between two currencies should equal the forward premium (or discount), so that a fully hedged cross-currency investment earns no excess return. CIP can therefore hold even when UIP does not: UIP deviations may reflect compensation for unhedged exchange rate risk or shifts in expectations, while CIP deviations point more directly to limits to arbitrage, funding pressures, market segmentation, or local credit risk. Nevertheless, in EMDEs, measured CIP premia can be materially large and volatile relative to those in AEs, reflecting market segmentation and local credit risk embedded in interest rates (Dao and Gourinchas 2026). Once local credit risk is removed, CIP premia track theory more closely and capture global dollar funding conditions and intermediation frictions (Cerutti and Zhou 2023). Recent work has shown that CIP premia move infrequently and largely in concert across currencies, reflecting aggregate financial conditions and the balance sheet constraints of intermediary banks, whereas UIP premia move frequently in response to currency-specific demand shocks (Dao, Gourinchas and Itskhoki 2025).

III. UIP Premia across Countries and over Time

Several stylized facts on UIP premia emerge when analyzing data from 25 EMDEs.³ To understand the role of time-varying factors related to a country's fundamentals versus financial developments that could affect equilibrating forces of demand and supply in currency markets, this section evaluates which economic conditions have historically been correlated with spikes in UIP premia. To understand the role of structural factors, it also studies UIP premia based on differences in capital account openness and FX market sophistication.

Notwithstanding their conceptual appeal, UIP premia are challenging to measure in the data, especially in real time, since they rely on measures of expectations of future exchange rates. Following conventions, the UIP premium is calculated as the premium paid by investors if the expected exchange rate depreciation of the local currency, $(E_t(e_{t+1}) - e_t)$, does not fully compensate for the interest rate differential to the United States, $(i_t^{peso} - i_t^{\$})$:⁴

$$UIP\ premium_t \equiv \lambda_t = (i_t^{peso} - i_t^{\$}) - (E_t(e_{t+1}) - e_t)$$

Exchange rate expectations $E_t(e_{t+1})$ are measured by the 3-month ahead expectations of professional forecasters surveyed monthly by Consensus Economics across a large sample of countries. Consistent with Stavrakeva and Tang (2020, 2024), they are closely aligned with the positions of major FX market participants, suggesting that they provide a reasonable proxy for the marginal foreign exchange trader's expected exchange rate movement. As such, they capture the behavior of key market participants that may face or amplify financial frictions in currency markets. Measuring imbalances in currency markets in real time would benefit from surveys at a higher frequency, as Consensus forecasts become available only with a 1-month lag.

UIP premia are a widespread feature in EMDEs, being positive and persistently volatile. The UIP holds if $\lambda_t = 0$. In practice, however, the UIP has been widely documented to fail to hold (Kalemli-Ozcan and Varela 2021). The long-run average UIP premium of the median EMDE since 2000 is positive (Figure 1). This suggests that investors on average demand a risk premium to attract capital to EMDEs; that is, they earn excess returns on their local currency portfolio (Box 1). This risk premium can vary over time because of both relative interest rates and frequent changes in expected exchange losses and gains.

The bulk of movements in the aggregate UIP premium is associated with expected changes in exchange rates rather than differences in interest rates across countries. This is the case unconditionally (Figure 1; Annex Figure 1.1), that is, without accounting for factors that may drive expectations of currency movements, including expectations about monetary policies. Moreover, large swings in the aggregate UIP premium tend to occur around global events that reflect risk-off episodes such as the Global Financial Crisis and the COVID-19 pandemic. These results reflect that expected swings in exchange rates are fundamentally more volatile relative to differences in interest rates across countries.⁵ This suggests that market participants

³ The sample of 25 emerging markets and developing economies is determined by data availability and consistency, reflecting countries with sufficiently long and comparable monthly series for 3-month UIP premia (the greater share starting in 2000) and key macrofinancial variables.

⁴ $e_t = \log(E_t)$, where E_t is the nominal exchange rate, defined as the number of local currency units per dollar, so that an increase means a depreciation of the currency against the dollar.

⁵ This contrasts with Kalemli-Ozcan and Varela (2025), who find a greater role of interest rate differentials in emerging markets and developing economies. Two factors help reconcile the difference. First, we use a 3-month horizon at which exchange rates are more volatile than at a 1-year horizon. Second, their 1996–2018 sample is shaped by the large emerging-market interest rate spikes of the late 1990s and early 2000s, whereas ours covers a calmer, more recent period.

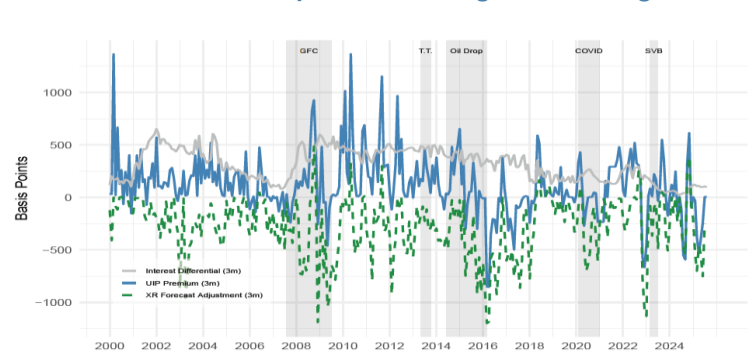
may be persistently reacting beyond what is explained by relative rates of return on average across countries.

But spikes also occur in periods other than global risk-off episodes. Looking into the country-level time series of UIP premia, factors other than changes in global risk aversion, linked to macrofundamentals and originating locally in EMDEs, also drive these spikes (Section V).⁶

UIP premia co-move with macro

fundamentals. The economic theory suggests that even in the absence of financial frictions, adverse shocks to the macro fundamentals of a country (for example, weaker growth, higher external debt, fiscal deterioration, reserve losses, and rising sovereign spreads) can increase UIP premia as investors demand extra compensation for the risk of holding domestic assets. The data partly confirm this. Variables that capture macroeconomic developments in EMDEs that are tied to the fundamental health of the economy—such as inflation, industrial production, and trade-weighted nominal and real effective exchange rates—tend to correlate positively with UIP premia (Figure 2, panel 1). But the co-movement is weak, with the median country showing only a slightly positive correlation.

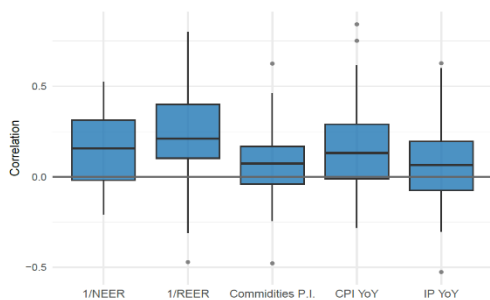
Figure 1. UIP Premia in EMDEs Broken Down by Interest Rate Differential and Expected Exchange Rate Changes



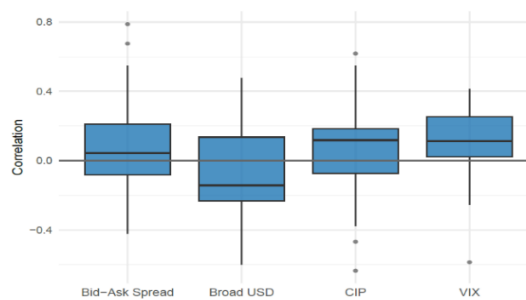
Sources: Refinitiv; Consensus Forecast; and IMF staff calculations.
Note: Median UIP across a sample of 25 EMDEs based on 3-month interbank or money market rates. UIP premia are measured in basis points.

Figure 2. Distribution of Country-Level Correlations of UIP Premia with:

1. Macroeconomic Fundamentals



2. Financial Drivers



Sources: Refinitiv; Consensus Forecast; and IMF staff calculations.

Note: The charts show the distribution (interquartile range) of the country-level correlations of UIP with the nominal and real effective exchange rate, inflation, and industrial production across a sample of 25 EMDEs.

The link between UIP premia and financial factors that could affect FX market depth varies across countries. State-of-the-art theories and evidence indicate that sudden shifts in risk in global financial markets could spill over to the risk-bearing capacity of financial intermediaries in local currency markets. Risk factors such as the global volatility index (VIX) and an appreciation in the broad US dollar index—signaling greater investor risk aversion—could render holding other currencies riskier and more expensive, restrict their ability to

⁶ For example, Kalemli-Ozcan and Varela (2025) find that domestic policy uncertainty explains a large share of the variation in UIP premia in emerging markets.

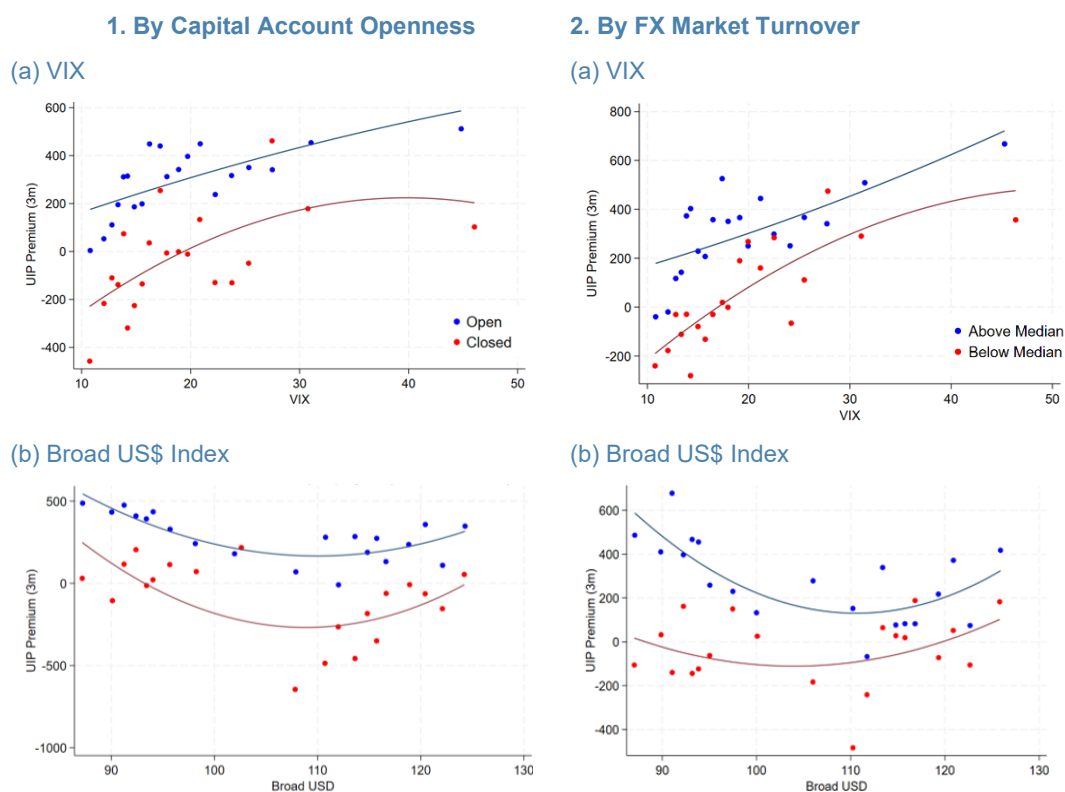
intermediate trade, and raise UIP premia. Country-specific factors could also tighten dollar funding conditions, raise hedging costs, and widen CIP premia and FX bid–ask spreads. Taken together, UIP premia should therefore positively correlate with a tightening in financial conditions of FX intermediaries. In the median EMDE, this correlation is rather muted and even negative in the case of the broad US dollar index (Figure 2, panel 2). That said, there remains considerable heterogeneity across countries, with some of them showing a stronger association, possibly owing to structural differences in their currency markets.

Greater capital account openness exposes countries to greater variations in UIP premia. While capital-flow management (CFM) measures can generate UIP premia by preventing arbitrage across currency markets, they tend to also partly insulate domestic currency markets from both global fundamental and nonfundamental drivers in the first place (for example, the global commodity cycle, global flights-to-safety). Accordingly, more segmented currency markets have been found to attenuate CIP premia in emerging markets (Cerutti and Zhou 2024). By the same token, countries with a more open capital account exhibit larger UIP premia with a slightly steeper link to financial factors that could disrupt currency markets (Figure 3, panel 1). Conversely, countries with lower capital account openness exhibit a weaker association. Notably, despite affecting the level and slope of the association, the degree of capital account openness does not materially affect the direction of the association.

Seemingly contrary to the conventional wisdom, FX markets with higher turnover exhibit larger UIP premia. If a currency market can absorb large trades without moving prices (high depth), financial intermediaries can more cheaply exploit expected excess returns. This reduces the equilibrium compensation (UIP premium) that investors demand for holding currency exposure. However, when proxying FX market depth through market trading turnover, countries with above-median-market turnover display higher UIP premia and a slightly steeper association with nonfundamental drivers in line with models of exchange rates based on financial frictions (Figure 3, panel 2). That said, FX turnover is not a pure measure of depth. In EMDEs, temporary episodes of higher turnover could also reflect increased speculative demand and larger risk exposure rather than improved intermediation capacity. When risk-taking scales faster than dealers' ability to warehouse currency risk, UIP premia can rise alongside turnover—the opposite of the textbook prediction. Another explanation for this counterintuitive result is that countries with higher turnover also tend to face a more open capital account that allows for more currency market penetration by the kinds of intermediaries who experience more balance sheet constraints. As such, enhancing capital account openness may come with a double-edged sword of fostering structural deepening of FX markets while increasing exposure to larger (temporary) spikes in UIP premia.

FX interventions (sales) correlate positively with UIP premia. Positive UIP premia have become an empirical regularity. But not all UIP premia are troublesome. It is when UIP premia become particularly large within a short period—a “spike”—that policymakers may pay careful attention—as they seem to be doing. In fact, FXIs have been used to “lean against” the largest UIP premia, as shown by the negative correlation in Figure 4. But the correlation is far from perfect, indicating that FXIs have also been used in many other episodes. These interventions could be related to other IPF frictions (for example, FX mismatches or concerns about de-anchoring of inflation expectations). Alternatively, it may have been preferable to reduce some of the interventions to preserve FX reserves for a possibly large future risk-off event or to build reserves for future use. The question of “how large” UIP premia should be to justify policy intervention is difficult to address, given that country characteristics vary widely. Besides looking at their magnitude, however, it is crucial to systematically examine the sources of spikes in UIP premia to gauge the appropriate policy mix (see Section V).

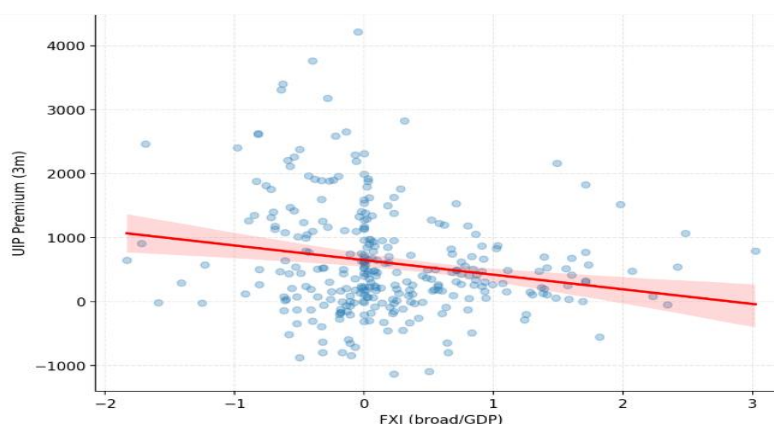
Figure 3. Positive Relationship between UIP Premia and Financial Variables, with Countries with a More Open Capital Account and Deeper FX Markets Seeing Larger UIP Premia



Sources: Refinitiv; Consensus Forecast; Fernandez and others (2016); Bank for International Settlements; and IMF staff calculations.

Note: UIP across a sample of 25 EMDEs. UIP premia are measured in basis points. The VIX and Broad US\$ are indices.

Figure 4. UIP Premia in EMDEs Correlate Positively with FX Interventions (Sales)



Sources: Refinitiv; Consensus Forecast; Adler and others (2025); and IMF staff calculations.

Note: UIP premia are measured in basis points. FXI is proxied by changes in broad reserves when official data are not available.

Negative values of FXI denote FX sales. The x-axis shows FXI as a percentage of GDP.

Because distinguishing fundamental-driven moves from friction-driven ones is difficult in practice, we next turn to a concrete case study to make the distinction vivid. Deviations from UIP and exchange rate swings do not always signal financial shocks. But when market functioning deteriorates, the same indicators can flag stress that merits a policy response. To illustrate how this line can be drawn more credibly, Section IV examines a well-documented episode in which the financial shock was clearly identified to be a significant driver of exchange rates and financial market indicators. This narrative, grounded in contemporaneous accounts, provides an intuitive lens for practitioners before we move to more systematic tools.

IV. Understanding the Anatomy of a Financial Shock: A Case Study from Chile

Chile's robust monetary policy framework, built around an inflation-targeting regime with a floating exchange rate and a transparent intervention policy, offers a solid foundation for understanding the 2019 social unrest episode and the central bank's response. The 3 percent inflation objective, combined with a two-year policy horizon and the monetary policy rate as the operational tool, has long underpinned credibility. In this system, the exchange rate is allowed to adjust to shocks, acting as a buffer, while FXI is reserved for exceptional circumstances in which exchange rate overreactions could jeopardize price stability or the normal functioning of payments. The CBCh framework also makes clear that intervention is not aimed at setting a specific exchange rate level.⁷ This credibility set the backdrop against which the 2019 unrest unfolded.

The 2019 social unrest in Chile unfolded rapidly, transforming from a localized protest into a nationwide crisis with significant political and financial repercussions. The episode began with peaceful student-led protests on October 6 after a modest 3 percent increase in the fare of the Santiago Metrorail system but escalated sharply on October 18 into nationwide riots with major infrastructure damage and widespread uncertainty. Political tensions culminated in an agreement on November 15 to initiate a constitutional reform process. Yet, despite the tapering of unrest, financial volatility persisted. By late November, in a relatively short window of a few days, the peso had depreciated nearly 15 percent relative to the previous month, peaking at CLP 830 per US\$ on November 28 when the Central Bank decided to intervene in the FX market.

The Banco Central de Chile (BCCh, the Central Bank of Chile), in its Monetary Policy Report released in early December of that year, offers a quasi-real-time look at how the central bank analyzed this event.

The analysis makes clear that this was not entirely perceived as a fundamentals-driven adjustment. The report compared the peso's observed path with a fundamentals-based econometric model incorporating copper prices, sovereign spreads, and interest rate differentials, among other fundamentals of the Chilean economy. The divergence widened markedly after October 18, with the peso showing a substantial decoupling from usual fundamentals.

A central concern among BCCh officials was the deterioration in broader financial conditions. The Monetary Policy Report described how the crisis triggered widespread volatility across asset classes:

The national financial market has been affected by the significant change in the economic scenario due to the ongoing social crisis that erupted in Chile on 18 October. In particular, the increase in uncertainty regarding the country's short- and medium-term evolution has caused a deterioration in a set of financial indicators: the stock market fell, the peso depreciated significantly, and fixed-income rates generally increased, as did money market interest rates, in both pesos and dollars. These movements have been highly volatile, and in some cases, they have exceeded what would be expected from the increase in country risk perception—the EMBI and the CDS spread have risen, but mildly. The domestic credit market has also been affected by the heightened local uncertainty. While credit interest rates remain low from

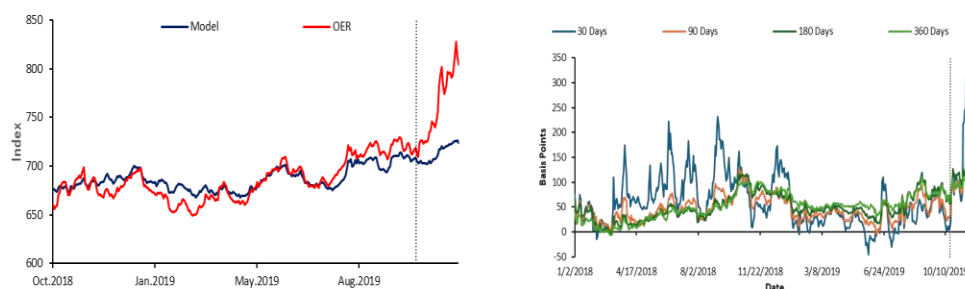
⁷ The CBCh's monetary policy framework states: "Under a floating exchange rate regime, the Central Bank reserves the right to intervene the forex market under exceptional circumstances, to limit market's overreactions that could jeopardize its objectives of price stability and a sound payments system, but never with the ultimate goal of setting a specific level for the exchange rate" (Central Bank of Chile 2020, p. 8).

a historical perspective, several qualitative information sources show a tightening of financial conditions. Moreover, debt placements have been less dynamic since October, especially in the consumer segment. (Central Bank of Chile 2019, p. 19)

Another source of concern was liquidity in peso and dollar funding markets. The on shore spread, which proxies banks' dollar funding costs relative to LIBOR, widened sharply. This measure of covered-interest-parity deviations highlighted a surge in the demand for liquidity and foreign currency assets (see Figure 5). Meanwhile, the deposit-swap spread, a measure of peso funding costs net of monetary policy expectations, also rose, though we report it here in the text only. Together, these indicators confirmed that the unrest created severe funding strains and market dysfunction. On liquidity conditions, the BCCh noted:

During the first days of the crisis, the financial markets did not experience any major changes. . . . However, from the second week of November on, the heightened uncertainty resulted in an increase in preferences for liquidity and foreign assets, causing a deterioration in liquidity conditions in dollars and in pesos, reflected in an increase in the onshore spread and the deposit-swap rate spread, respectively. . . . This was mainly driven by an intensification of portfolio movements that were already occurring before the crisis: namely, a reduction of positions in local-currency instruments—especially fixed-income—by the institutional investors in favor of foreign assets.⁸ (Central Bank of Chile 2019, p. 20)

Figure 5. Nominal Exchange Rate: Observed Versus Model-Based Dynamics



Source: Central Bank of Chile.

Note: Left panel presents the model-based and observed exchange rate CHL/US\$. BCCh's model uses a daily frequency and is estimated for the period July 15, 2019, to December 3, 2019. The estimation considers a long-term equilibrium relation between the nominal exchange rate, the copper price, the oil price, the domestic price level, the US price level, the CDS spread on Chilean sovereign bonds, and the 1-year interest rate differential between Chile and the United States. Panel 2 presents the onshore spread at different maturities, a proxy of CIP deviations computed as the spread over the LIBOR implied in forward prices, based on the marginal prime deposit rate and the secondary market deposit rate. The vertical dotted line in both subplots marks the day the riots began on October 18, 2019.

In short, social unrest translated into a tightening of financial conditions beyond what could be justified by fundamentals. The stress spilled into fixed-income markets, where bond yields and term spreads widened and corporate bond spreads increased across credit-risk categories. The BCCh's report documents pension and mutual funds reducing their fixed-income positions, compounding the strain.

The BCCh responded to rising financial volatility. On November 13–14, it introduced targeted liquidity measures to ease volatility: FX swaps in US\$ with 30- and 90-day maturities to contain onshore dollar funding spreads, peso repo facilities offered at rates linked to the policy rate and backed by a broader range of collateral, and authorizations of repo operations against securities that had not previously been eligible. When

⁸ The report defines the onshore spread as reflecting banks' funding costs in dollars and the deposit-swap spread as reflecting banks' funding costs in pesos, net of monetary policy expectations.

volatility persisted, the BCCh escalated its measures. On November 28, it announced an FXI program consisting of up to \$10 billion in spot dollar sales and \$10 billion in forward operations—equivalent to roughly half of the stock of FX reserves at the time. As in earlier interventions, operations were sterilized to preserve the monetary stance.

The BCCh’s diagnosis of the 2019 unrest provides a strong narrative foundation for our empirical identification of financial shocks. The peso’s sharp depreciation, its decoupling from usual fundamentals, the spike in funding spreads, and the deterioration of liquidity conditions are consistent with the type of market dysfunction that the toolkit classifies as an adverse financial shock. This interpretation is further supported by the BCCh’s subsequent description of the November 2019 FXI as responding to “what was perceived as an excessive degree of exchange rate volatility that could hinder price formation and spending and production decisions by individuals and firms, as well as affect the healthy adjustment of the economy and create concern in markets” (Central Bank of Chile 2020, p. 29). For empirical analysis, this evidence justifies imposing a positive financial shock for October–November 2019, grounding identification in policymakers’ assessment of market conditions.⁹

The Chile case study can be extended systematically across time and across countries by screening for sharp depreciations and then validating candidate episodes using contemporaneous central bank documents and market commentary.¹⁰ Box 2 summarizes how we operationalize this extension—covering the countries, time windows, and sources that allow narratives to be applied in a replicable way. The next section builds on these narrative anchors and presents a simple empirical approach to distinguish when UIP premia reflect market frictions versus underlying fundamentals.

⁹ After the convention in the literature, a positive financial shock denotes an adverse shock that depreciates the currency on impact.

¹⁰ While the frameworks are symmetric, and appreciations that result in an excessive easing of financial conditions can also justify intervention (IMF 2023), narratives are typically clearer and more transparent in the case of depreciations, so the analysis focuses exclusively on these in the search for narrative restrictions.

Box 2. Extending the Narrative Approach: Countries, Time, and Sources

The case of Chile’s 2019 Social Uprising illustrates how central bank narratives can serve as powerful anchors for identifying financial shocks, motivating a broader extension of this approach. While the Chilean case offers a compelling example, relying on a single case is insufficient for building a systematic tool. For that purpose, we extended the narrative approach in three directions: over time, across more countries, and by drawing on additional sources of evidence. To do so, we first systematically identify episodes of sharp and rapid exchange rate depreciation. We then analyze contemporaneous central bank and market reports, using a two-stage procedure that combines keyword filtering with LLM-based classification to extract relevant information (see Emeksiz and others 2026 for further details).

First, extension over time. For Chile, we applied the same logic beyond 2019, scanning the post-2000 period for large exchange rate depreciations. Episodes were identified quantitatively—months when the peso’s depreciation was unusually large relative to historical norms—and then cross-checked against contemporaneous central bank reports. This systematic approach uncovered other shocks with similar characteristics, such as the 2001 spillovers from Argentina’s default, the 2008 Global Financial Crisis, the onset of COVID-19 in 2020, and the 2022 FX volatility episode.

Second, extension to another country. To test robustness, we applied the same methodology to Brazil, another inflation-targeting emerging market with a floating exchange rate. Our analysis of Brazil highlights triggers such as political uncertainty in 2002 but shares in common with Chile other triggers such as the Global Financial Crisis in 2008 and COVID-19-related dysfunction in 2020.

Third, adding market commentaries. While official documents provide authoritative assessments, market commentaries can provide complementary information on contemporaneous investor perceptions and market conditions. We therefore complemented central bank reports with contemporaneous notes from market analysts (for example, investment banks and EIU reports) to enrich the analysis and capture real-time investors’ perceptions and reactions. These commentaries often emphasized elements such as uncertainty amid political drivers, which central bank commentaries may not cover. To reduce confirmation bias, we cross-validated episodes across central bank reports and market commentaries.

The narrative anchors used in the empirical exercise cover five episodes for Chile and three for Brazil. For Chile, spillovers from Argentina’s default in 2001, the Global Financial Crisis in 2008, the social uprising in 2019, the onset of COVID-19 in 2020, and the 2022 FX volatility episode. For Brazil, the 2002 political uncertainty episode, the Global Financial Crisis in 2008, and the COVID-related market dysfunction in 2020.

Taken together, this broader exercise shows that narrative identification is a replicable, multi-source approach. It can be applied systematically across time and countries, blending official assessments with market commentaries to build a richer, more reliable map of financial shocks in emerging markets.

V. Systematically Breaking Down UIP Premia into Frictions Versus Fundamentals

This section introduces an empirical toolkit to infer the drivers of the exchange rate and UIP premia. It helps isolate the part driven by financial as opposed to fundamental shocks.¹¹ It combines sign restrictions motivated by benchmark theoretical models with narrative information from known episodes of currency market stress. It illustrates the use of the toolkit for two countries (Chile and Brazil) and provides the underlying conceptual framework to apply it to other countries. The toolkit complements existing IMF guidance and provides a framework to interpret movements in indicators of disorderly market conditions (DMC).

The starting point is a minimal yet theoretically grounded set of patterns that can be used to distinguish between fundamental shocks—such as productivity and monetary policy shocks—and financial shocks that reflect nonfundamental movements in exchange rates. This draws on insights from a range of theoretical models, including Itskhoki and Mukhin (2021), Bodenstein and others (2024), Adrian and others (2021), and Kekre and Lenel (2024). These models share a common structure in which UIP deviations arise from both fundamental sources (for example, changes in productivity or monetary policy) and financial frictions (for example, intermediation constraints, risk premia, or noise trading). While the precise mechanisms differ, they imply qualitatively similar responses of the main FX market financial variables to different types of shocks.

The key distinguishing feature of the financial shock across all these models is the relative co-movement between the two components of the UIP premium, namely, the interest rate differential and expected depreciation. In the case of a financial shock, larger interest-rate differentials (that is, higher domestic relative to foreign interest rate) are associated with a depreciation on impact, and thereafter an expected appreciation of the home currency, a pattern that is consistent with the forward-premium puzzle in FX markets (Fama 1984). This occurs because the underlying source of this disturbance is an increase in demand for foreign currency relative to domestic bonds, which must result in an equilibrium positive expected return on home-currency bonds, even after accounting for exchange rate movements. By contrast, fundamental shocks like productivity and monetary policy do not reproduce this empirical regularity, instead implying a positive correlation between expected depreciation and the interest rate differential.

The social unrest episode in Chile in October and November 2019 displayed the pattern of a textbook financial shock where interest rate and exchange rate movements reinforced each other. The selloff in local currency bonds entailing a sharp depreciation of the exchange rate led to both a relative increase in the domestic interest rate and an expected appreciation of the peso. This pattern helped offset the root cause of the shock, which was a selloff in domestic currency markets, by offering positive expected returns to those investors who continued to hold domestic currency assets instead of selling them. In contrast, the copper price decline in April 2013 had the features of a fundamental (term of trade) shock, where interest rate movements and expected exchange rate movements tended to offset each other. In particular, the peso depreciated and domestic interest rates declined relative to foreign ones, reflecting the weakening of the economy, but the expected appreciation of the peso prevented a wider selloff in domestic currency markets, highlighting the role of exchange rates as a stabilizer in this episode.

¹¹ The toolkit, which is based on a Bayesian vector autoregression model, is developed and described in detail in an accompanying technical working paper by Emeksz and others (2026). It builds on the methodology of Antolín-Díaz and Rubio-Ramírez (2018) and abstracts from any time variation (including in coefficients and volatility regimes) that is not central to the exercise.

Table 2 summarizes this and other robust sign patterns of the financial shock across models that form the basis of the VAR toolkit, and Appendix B uses a simulated version of the model in Itskhoki and Mukhin (2021) as well as Adrian and others (2021) to illustrate these patterns.

Empirical work often relies only on sign restrictions similar to Table 2 to identify structural shocks.

While theoretically grounded, these restrictions usually deliver only partial identification and leave space for ambiguity. Narrative restrictions help overcome this limitation by anchoring shocks to specific, well-documented historical events in which their nature is clear from contemporaneous as well as historical narrative accounts.¹² Leveraging this insight, the framework uses Chile’s October–November 2019 social uprising covered in the previous section as well as four other similar episodes detailed in Emeksiz and others (2026) to complement sign restrictions. The framework imposes these restrictions in a minimal form, imposing only that the financial shock is active during the identified episodes. It does not rule out the presence of simultaneous fundamental shocks, which, for instance, were also likely at play during the social unrest episode in Chile.

A. Choice of Variables Used in the Toolkit

The toolkit requires a balanced set of variables that capture both macroeconomic fundamentals and financial shocks. This dual focus also motivates our choice of building the toolkit at monthly frequency.

Quarterly data would obscure the high-frequency dynamics of financial shocks, while daily data—though rich for financial variables—would preclude the inclusion of key macro aggregates that are critical to isolate and understand the effects of the financial shock. A monthly frequency strikes a pragmatic balance, allowing us to incorporate both dimensions in a coherent structural VAR framework. That said, in the subsequent section, we also illustrate how high-frequency (daily) data can be used in the toolkit to allow policymakers to draw inferences on the nature of the shocks driving exchange rates in real time.

In practice, we implement these restrictions using a set of narrative anchors constructed following the systematic procedure (Box 2). This process involves identifying sharp depreciation episodes and validating them with contemporaneous central bank reports and market commentaries—so that the SVAR is disciplined by both model-consistent sign patterns and documented, narrative evidence on market dysfunction.

The toolkit takes as input the following 10 macrofinancial variables at monthly frequency:¹³ **(1) UIP premium** ($i_{t^{peso}} - i_t\$ - (E_t(S_{t+1}) - S_t)$); **(2) interest rate differential** ($i_{t^{peso}} - i_t\$$); **(3) inflation** (percent change in CPI); **(4) nominal depreciation** (percent change [m-o-m] in bilateral nominal exchange rate versus US\$; increase means depreciation of peso); **(5) output** (year-on-year change in IMACEC nonmining output index, seasonally adjusted); **(6) CIP deviation** (percent); **(7) net capital inflows** (nominal, US\$); **(8) FX bid–ask spread** (spot, percent); **(9) FXI** (net purchase of foreign currency; nominal, US\$); **(10) policy rate** (percent).

The UIP premium is the central object of interest in our analysis. Its decomposition into the interest rate differential (based on interbank deposit rates) and expected depreciation is equally critical to include since it helps identify the financial shock through sign restrictions.¹⁴ In addition, nominal depreciation and net capital inflows are also included since they provide complementary information to help identify the shock and rule out

¹² See, for instance, Wolf (2022) and Antolín-Díaz and Rubio-Ramírez (2018) for a detailed theoretical exploration of this insight.

¹³ The sample runs from January 1998 to June 2024 (see Emeksiz and others 2026 for further details on the estimation).

¹⁴ As shown in Annex B, these sign patterns help identify financial shocks that capture destabilizing fluctuations in the UIP premia that are driven by nonfundamental cross-border flows (for example, noise traders) as well as changes in financial intermediaries’ risk-bearing capacity, which often manifests in market shallowness.

potential fundamental shocks that generate similar co-movements between the UIP components as a financial shock.¹⁵ Table 2 shows the full set of impact sign restrictions that are used in the analysis.

Table 2. Sign Restrictions Used to Identify an Adverse (Positive) Financial Shock

	Net Capital Inflows	UIP	$r_t - r_t^*$ Interest Differential	$E_t(e_{t+1} - e_t)$ Expected Depreciation	$(e_t - e_{t-1})$ Depreciation
Financial Shock	↓	↑	↑	↓	↑

Note: The table indicates impact sign restrictions imposed to identify the financial shock.

Source: Emeksiz and others (2026).

To assess the real effects of financial shocks, we include measures of economic activity and prices. At monthly frequency, the output is proxied by the IMACEC nonmining index (for Chile) and its Brazilian counterpart, while inflation is captured by the CPI. Other aggregates such as consumption or investment are unavailable at this frequency, making these two variables the most informative indicators of macroeconomic conditions.

CIP deviations and bid–ask spreads serve as additional barometers of market functioning. Their inclusion helps distinguish genuine financial shocks from shifts in fundamentals, as episodes of market dysfunction typically manifest in these indicators.¹⁶ Finally, to capture systematic policy responses, we include the short-term policy rate and FXI. These variables allow us to control for and highlight the endogenous reactions of the monetary and FX policy to financial disturbances.

B. Applying the Toolkit: The Case of Chile

Application of the toolkit to historical data in Chile helps uncover key patterns in the transmission of the financial shock. In line with the identifying sign restrictions, the UIP premium, the interest rate differential, and nominal depreciation increase (see Figure 6).

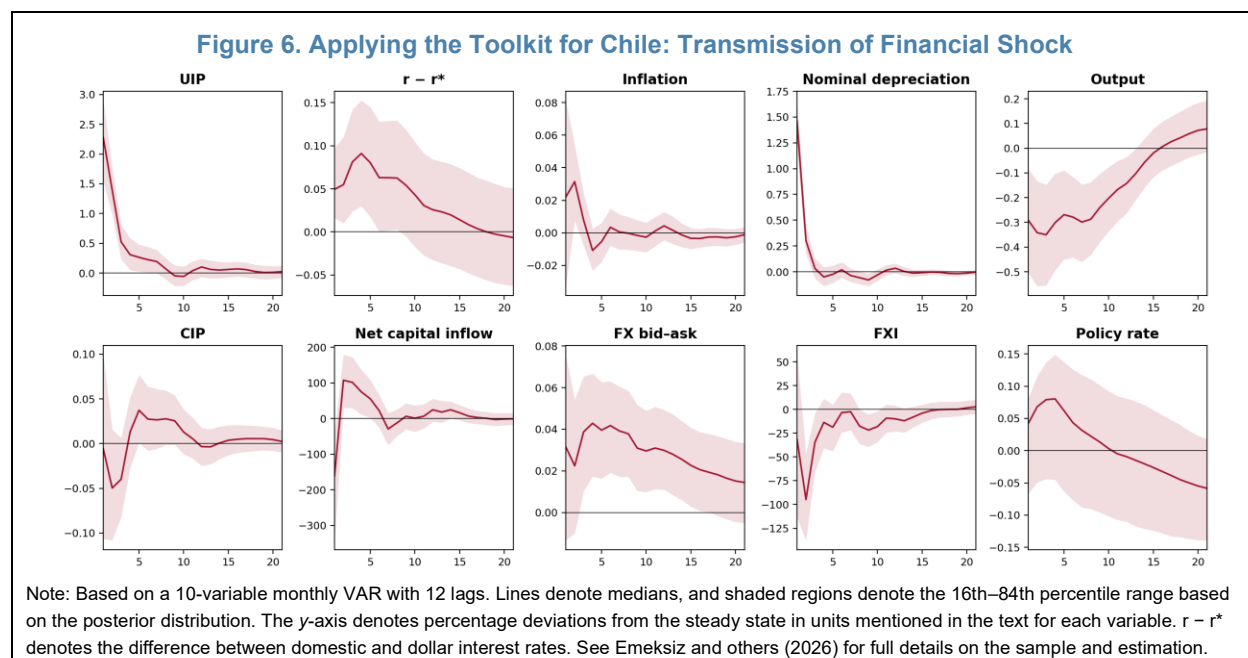
The financial shock turns out to be strongly contractionary. Output declines sizably, by 0.3 percent on impact, and remains below pre-shock levels for over a year. This evidence is consistent with the financial channel of exchange rates, which often makes depreciations contractionary rather than expansionary in emerging market economies.¹⁷

The financial shock is inflationary in Chile. Inflation rises on impact, although the impact is temporary since the policy rate reacts promptly, reflecting an active monetary response, potentially to contain second-round effects. These adjustments occur alongside wider FX bid–ask spreads, reinforcing the interpretation that the identified disturbance is a financial, non-fundamental shock rather than a shift in macro fundamentals.

¹⁵ See, for instance, Engel (2016) and Valchev (2020).

¹⁶ Dao and Gourinchas (2026) note, that unlike advanced economies, in emerging markets, CIP deviations need not be a pure financial indicator and often include a significant credit risk component and propose a measure of CIP that is purged of it. Although this measure is not available for Chile, we show in Appendix C that our results for Brazil are robust to replacing our measure of CIP based on interbank rates with the Dao and Gourinchas (2026) measure, even when we impose an explicit restriction for the latter to rise in response to the financial shock, given its stronger financial nature.

¹⁷ See, for instance, Akinci and Queralto (2024) and Hofmann and others (2022).



Indicators of financial stress also react strongly. Along with the UIP premium, the FX bid–ask spread tends to rise after the shock. This is consistent with a tightening in liquidity conditions and the presence of frictions in financial intermediation in the FX market. The fact that an indicator like the bid–ask spread, which is available to policymakers in real time, reacts significantly to the shock offers scope for detecting such shocks at a high frequency, as illustrated in the next section.¹⁸

Policy variables also respond systematically around identified financial shocks. The combination of declining output and rising prices presents a trade-off for monetary policy. In several emerging market economies, tightening is advisable to curtail the second-round effects of depreciations on inflation and de-anchoring of inflation expectations. Figure 6 also shows higher FX sales after the identified shock, indicating that FX policy responds systematically during these episodes.¹⁹

The toolkit can be used to quantify the historical importance of the financial shock in accounting for fluctuations in the economy. Specifically, the toolkit can quantify the share of the variance of a given variable that is attributable to a particular shock. This provides a scale-free measure of the shock’s quantitative relevance.

¹⁸ The framework quantifies the financial shock based on exchange rate pressure from financial frictions and market dysfunction irrespective of whether they originate domestically or abroad. In practice, Emeksiz and others (2026) find that the shock bears a positive but moderate correlation with indicators of the global financial cycle such as the VIX, but that including these global variables in the framework itself does not significantly improve the recovery of the financial shocks from the data, which is well pinned down by the components of UIP.

¹⁹ Both elements of the toolkit—sign restrictions as well as the narrative episodes—are critical to uncovering the transmission mechanisms of the financial shock. As shown in Figure C.2, without narrative restrictions, the response of key variables such as output, inflation, and the policy rate is subject to greater uncertainty and is indistinguishable from zero. The policy response should be interpreted as an estimated policy reaction in the vector autoregression (VAR), not as a statement about the BCCh’s objective or as a causal evaluation of the effectiveness of intervention. The framework captures the joint dynamics of the financial shock and associated policy responses. It does not separately identify the counterfactual path of macroeconomic variables in the absence of monetary policy or foreign exchange intervention.

The financial shock plays a sizably more prevalent role in driving UIP and exchange rate fluctuations, as opposed to output and inflation (Figure 7). It accounts for approximately one-third of the variance of the UIP premium and about one-half of nominal exchange rate fluctuations. In contrast, it accounts for less than 10 percent of macroeconomic aggregates such as output and inflation. As noted in the previous section, the framework captures the impact of the shock together with associated policy responses, but does not disentangle the two. As such, the impact of the shock on macro variables absent supportive action could be different and larger.

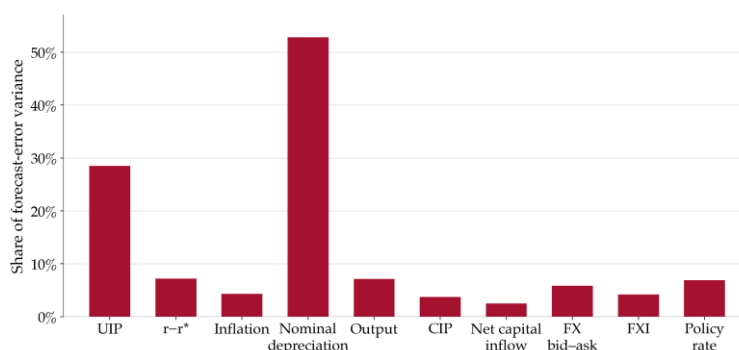
These findings are qualitatively consistent with the view that financial disturbances dominate exchange rate dynamics while having limited influence on macroeconomic aggregates: the exchange rate disconnect emphasized by Itskhoki and Mukhin (2021), among others. That said, the contrast uncovered here is less stark

than in Itskhoki and Mukhin (2021), where the financial component explains over 90 percent of the exchange rate and a much smaller share of output. This suggests that the contrast between the drivers of the exchange rate, on the one hand, and macroeconomic fundamentals on the other, while evident, is not as stark as in canonical models, particularly for an emerging market economy where the exchange rates and financial shocks are likely to have a stronger influence on real economic activity and prices. Moreover, unlike in stylized models such as Itskhoki and Mukhin (2021), where everything not attributed to financial shocks is by construction fundamental, here, the residual also absorbs measurement error and features of the financial shock that a linear framework does not fully capture. The financial-shock share is therefore best read as a lower bound on the role of frictions, with the remainder reflecting fundamentals together with these limitations rather than fundamentals alone.

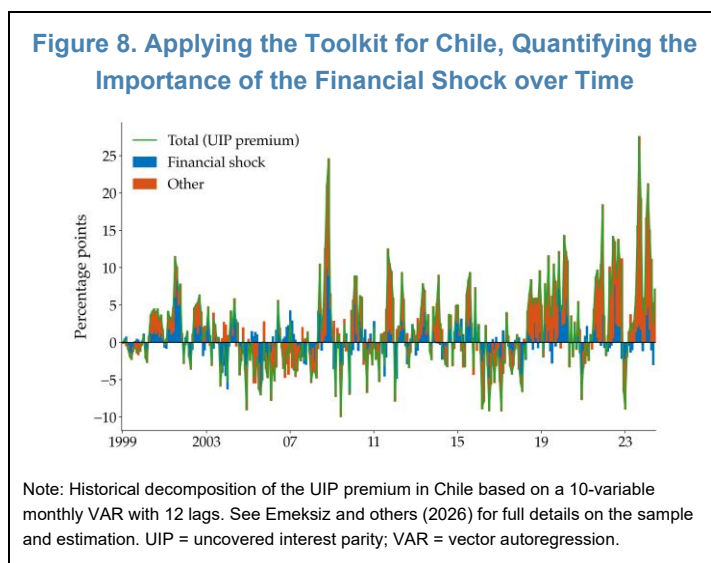
Beyond the average historical importance, the toolkit also helps track the relevance of the shock on a month-by-month basis. Figure 8 illustrates this for the UIP premium and output in Chile. The decomposition highlights that the financial shock is not a constant driver but instead exhibits episodic dominance, with large positive contributions during well-documented stress episodes—such as the Global Financial Crisis in 2008, the 2019 social unrest, and the 2022 volatility spike—and near-zero or even negative contributions in tranquil periods.

This pattern reinforces the interpretation that the identified shock captures disorderly market dynamics rather than systematic fundamentals, consistent with the narrative evidence and the sign restrictions imposed. By complementing the sample-average forecast error variance decomposition (FEVD) with this time-series perspective, we underscore the episodic nature of financial shocks and their alignment with historically recognized events.

Figure 7. Applying the Toolkit for Chile, Quantifying the Importance of the Financial Shock



Note: Based on a 10-variable monthly VAR with 12 lags. Bars denote the share of the financial shock in explaining the variance of the respective variable over the full sample. $r - r^*$ denotes the difference between domestic and dollar interest rates. See Emeksz and others (2026) for full details on the sample and estimation. CIP = covered interest parity; FX = foreign exchange; FXI = foreign exchange intervention; UIP = uncovered interest parity.



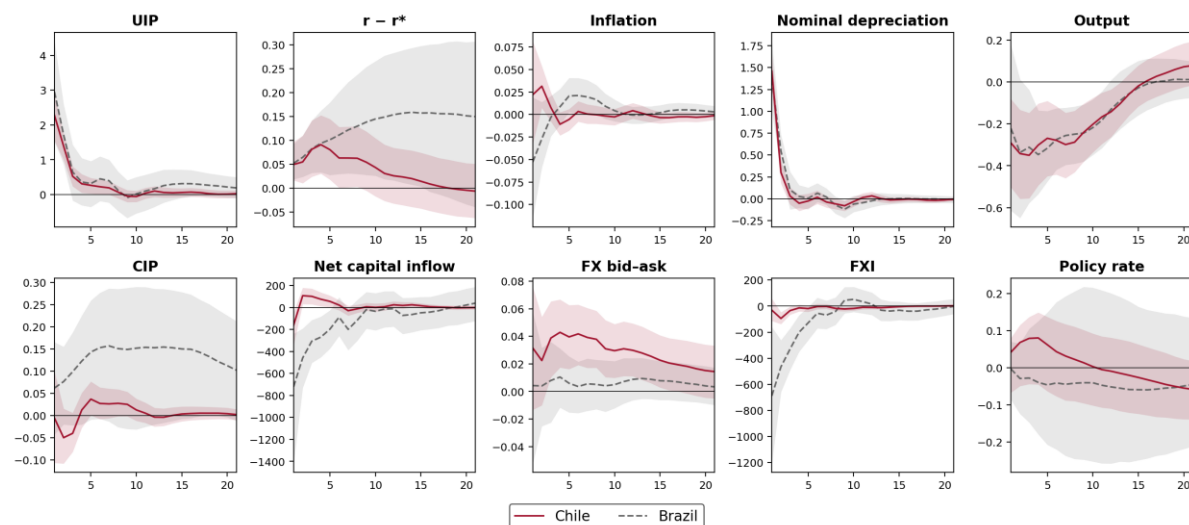
C. Applying the Toolkit to Compare Brazil and Chile

Both economies exhibit comparable magnitudes of UIP premium increases, nominal depreciation, and short-run declines in output after a financial shock (Figure 9). The output response is negative and of similar magnitude and persistence in both cases, underscoring the real effects of financial disturbances even when fundamentals are not the primary driver of exchange rate movements.

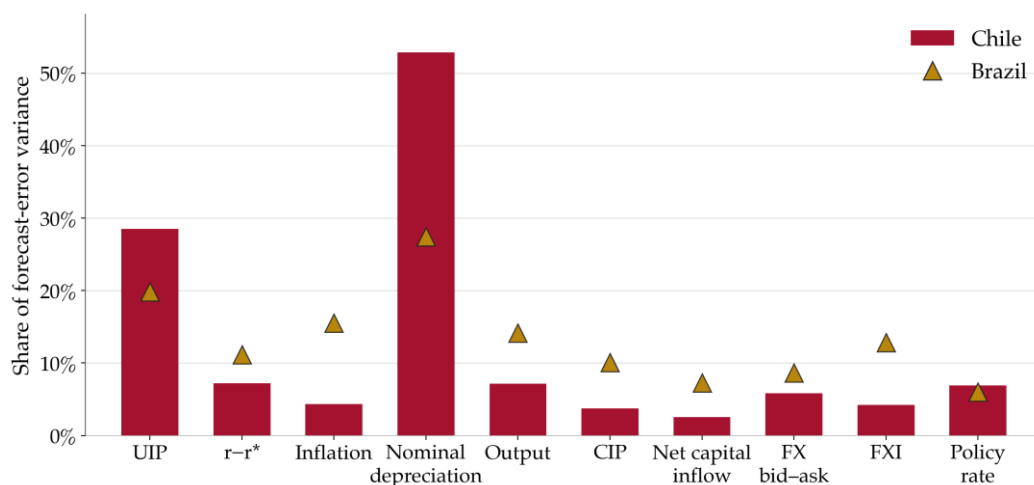
Key differences emerge, however, in the inflation and policy rate responses. In Chile, the shock is inflationary on impact, consistent with high exchange rate pass-through, and the policy rate rises promptly, reflecting a tightening stance to contain price pressures. In contrast, Brazil displays a mildly deflationary response to go with the output decline, suggesting that financial tightening dominates the exchange rate channel in shaping near-term price dynamics.

Differences also appear in financial stress indicators. In Chile, the FX bid–ask spread widens sharply, signaling liquidity strains in spot markets, whereas in Brazil the most pronounced reaction is in CIP deviations, pointing to stress in cross-currency funding markets. These contrasts highlight how institutional structures and market depth shape the transmission of financial shocks, even when the underlying identification strategy is harmonized across countries.

In both economies, the overarching pattern holds: the shock explains a substantially larger share of the variance of the UIP premium and the nominal exchange rate (depreciation) than of macro aggregates such as output and inflation (Figure 10). However, the contrast is sharper in Chile, which exhibits a pronounced wedge between the financial variables (UIP and the exchange rate), where the shock's contribution is large, and the macro variables, where the contribution remains small. In Brazil, by contrast, our analysis suggests that while the same ordering is evident—financial variables loading more heavily on the financial shock than macro aggregates—the gap is less pronounced.

Figure 9. Applying the Toolkit: Comparing the Transmission of a Financial Shock for Chile and Brazil

Note: Based on a 10-variable monthly VAR with 12 lags. Lines denote medians and shaded regions denote the 16th–84th percentile range based on the posterior distribution. The y-axis denotes percentage deviations from the steady state in units mentioned in the text for each variable. $r - r^*$ denotes the difference between domestic and dollar interest rates. See Emeksiz and others (2026) for full details on the sample and estimation. CIP = covered interest parity; FX = foreign exchange; FXI = foreign exchange intervention; UIP = uncovered interest parity.

Figure 10. Applying the Toolkit: Comparing the Importance of the Financial Shock in Brazil and Chile

Note: Based on a 10-variable monthly VAR with 12 lags. Bars (for Chile) and triangles (for Brazil) denote the share of the financial shock in explaining the variance of the respective variable over the full sample. $r - r^*$ denotes the difference between domestic and dollar interest rates. See Emeksiz and others (2026) for full details on the sample and estimation. CIP = covered interest parity; FX = foreign exchange; FXI = foreign exchange intervention; UIP = uncovered interest parity.

VI. Using the Toolkit for Real-Time Inference

The toolkit can also be used to inform policy choices in real time. The previous sections illustrated how the toolkit can recover a historical account of the drivers of exchange rates and associated spikes in UIP premia. While movements consistent with Table 2 can, in principle, offer policymakers a first-pass assessment of the nature of the shock without leveraging the full framework, given data lags and revisions, policymakers rarely have the luxury of waiting for the full record to be revealed. Decisions on FXI, for instance, often need to be made while the shock is unfolding, with only partial information at hand. This section shows how the same toolkit can be adapted for real-time use—combining information embedded in the toolkit based on historical data with additional high-frequency signals, such as the nominal exchange rate and the FX bid–ask spread, to update inference as days and weeks go by.

In real time, signals will often be mixed, and data may arrive with delays. A practical approach is to treat the toolkit as a hierarchy of evidence. The essential evidence is whether exchange rate pressures and UIP premia display the sign pattern associated with financial frictions. Corroborating evidence comes from CIP deviations, FX bid–ask spreads, funding-market indicators, capital-flow pressures, reserve-market behavior, and contemporaneous narratives from policymakers and market participants. When survey expectations, capital-flow data, or official FXI data are not yet available, fallback indicators such as spot and forward exchange rate volatility, bid–ask spreads, high-frequency market commentary, and funding spreads can provide partial information. Conflicting signals should reduce confidence in the diagnosis rather than trigger a mechanical policy conclusion. Moreover, if the main concern is inflation expectations or balance sheet mismatches, the relevant IPF assessment may extend beyond use case A.

To illustrate the real-time capabilities of the toolkit, we consider two episodes in Chile: One in which the shock was unambiguously adverse (positive) based on narrative records (June 2022) and one in which the shock was close to zero based on the full-sample VAR (May 2023).

A. A Real-Time Read on June 2022

We begin with an analysis of June 2022 to see the extent to which the toolkit could infer the occurrence of the financial shock in real time. Starting from the beginning of the month, we allow the toolkit to incorporate information that arrives within the month on two variables that are (1) observable at high (daily) frequency and (2) informative about the financial shock, based on the impulse responses studied in the previous section (which could vary by country). These two variables are (1) the nominal exchange rate and (2) the FX bid–ask spread.²⁰ Their intra-month daily signals can help tilt the toolkit’s inference toward or away from a financial shock as they evolve. Figure 11 plots the daily path of the exchange rate and the bid–ask spread for the months we study.

At the beginning of the month, the shock is equally likely to be adverse (positive) or negative, by construction. The first row in Table 3 summarizes the evolution of real-time inference on the posterior probability of the shock being positive in the given month, starting with an uninformed value of 0.5 when no information is released.

²⁰ The set of variables that are informative about the shock in real time can differ across countries and leverages the VAR rather than acting as an independent replacement for it. For instance, the bid–ask spread is a good candidate for Chile, but not Brazil since it hardly responds to the shock for the latter (Figure 10). Moreover, the VAR used for this analysis contains only a single narrative restriction (social unrest of 2022), and not the June 2022 restriction, to mimic real-time inference.

The probability of a positive financial shock falls in the first week of June 2022. This happens because the exchange rate appreciated modestly and the FX bid–ask spread remained contained (Figure 11). As these daily signals accrue, the real-time probability of a positive financial shock falls below 0.5–0.34, consistent with benign market conditions.

From the second week onward, however, the picture changes sharply, and high-frequency data clearly indicates the presence of a positive financial shock. Beyond week 1, the domestic currency depreciates rapidly while the bid–ask spread widens, both hallmarks of strained market intermediation. The toolkit correspondingly revises up the probability of a positive financial shock, pushing it above 0.5 and toward 1 by month end.

B. A Falsification Test: May 2023

To test robustness, we repeat the exercise for May 2023, a month in which the full-sample VAR attributes no role for a financial shock (with the inferred value of the shock being close to zero based on complete historical data). We again feed the toolkit the same high-frequency inputs (daily exchange rate and bid–ask spread) and track the real-time probabilities.

Unlike June 2022, the estimated probability now hovers around 0.5 throughout the month and never trends decisively higher or lower (Table 3). This is consistent with the bottom panel in Figure 11, which shows that both the exchange rate and the bid–ask spread mostly move sideways through the month, unlike in June 2022, when they move up together in weeks 2 and 3. In other words, as daily information arrives, the toolkit does not accumulate evidence pointing to a decisive positive or negative financial shock. This “quiet-month” outcome provides a useful placebo check: when underlying conditions are fundamentally calm, real-time updating stays near agnostic, avoiding false alarms.

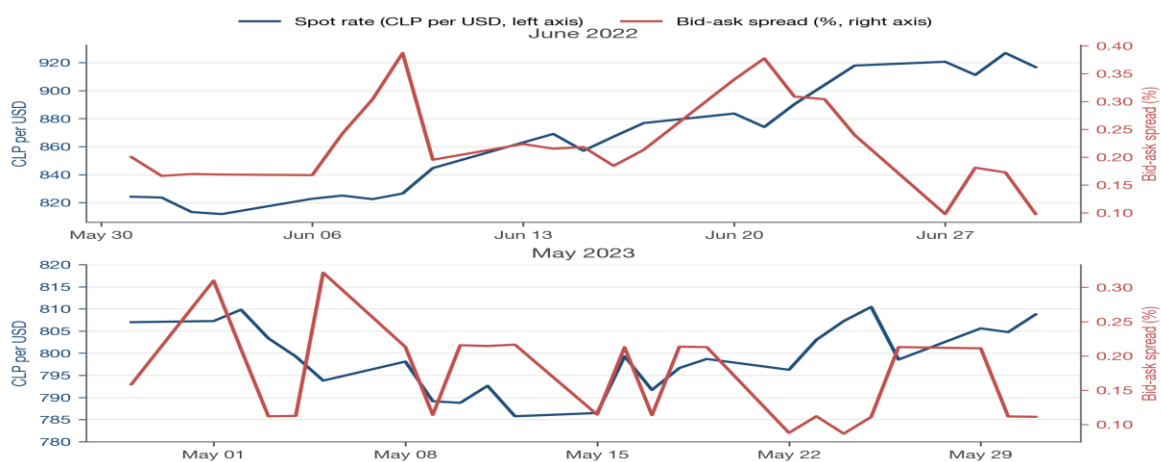
The episodes examined here illustrate the value of the toolkit in providing real-time guidance, which is critical for policymakers. In June 2022, the toolkit—starting from a neutral prior—learned from high-frequency signals that liquidity conditions were deteriorating, with probabilities that moved convincingly above 0.5 by mid-month and approached unity by month end. In May 2023, by contrast, the same procedure did not find accumulating evidence of a positive financial shock: probabilities hovered near 0.5, consistent with a month dominated by fundamentals and routine market noise rather than dislocations. These examples show that so long as reliable and timely data on informative variables from the toolkit are available at a high frequency, the combination of a simple identification prior and a disciplined, high-frequency update can provide policymakers with a practical nowcast of whether observed currency movements are becoming consistent with market-functioning pressures relevant for IPF use case A, while leaving the broader policy assessment to be conducted separately.

Table 3. Probability of a Positive Financial Shock During the Month

	0 Days	1 Week	2 Weeks	3 Weeks	4 Weeks
June 2022	0.5	0.34	0.83	0.86	0.96
May 2023	0.5	0.49	0.43	0.49	0.47

Source: Authors' calculations.

Figure 11. Chile Daily Spot Rate and Bid-Ask Spread Movements



Sources: Refinitiv; and authors' calculations.

VII. Conclusion and Policy Implications

This SDN provides a systematic framework for interpreting the drivers of exchange rate movements in EMDEs, with a particular focus on the role of financial shocks and the implications for FX intervention.

The analysis underscores that while exchange rate flexibility is generally desirable and can facilitate macroeconomic adjustments, there are circumstances in which market frictions can lead to destabilizing currency movements, even when domestic fundamentals are sound.

A key contribution of this note is the introduction of an empirical toolkit that can help policymakers distinguish between exchange rate fluctuations driven by underlying macroeconomic fundamentals and those arising from financial shocks or amplification. By leveraging monthly data on a range of macrofinancial variables and drawing on insights from both theoretical models and narratives from real-world case studies, the toolkit provides a practical means of diagnosing the drivers of currency movements.

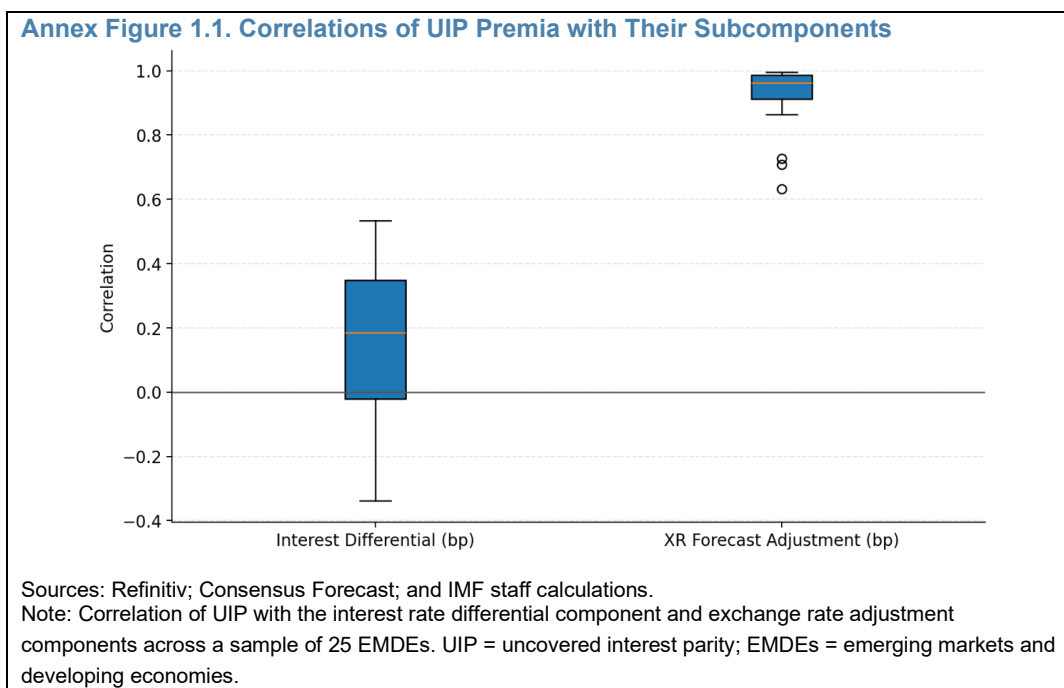
When applied to Chile and Brazil, the toolkit reveals that on average, only about a third of UIP fluctuations are attributable to financial shocks. Most of the time, exchange rate movements reflect forces that may not require any policy action. However, the analysis also highlights that when financial frictions amplify shocks, their effects on the real economy can be significant. Episodes characterized by sharp increases in financial stress are associated with notable declines in output, underscoring the importance of monitoring market-functioning indicators and assessing whether IPF use case A may be relevant. The toolkit's ability to provide real-time assessments further enhances its value, allowing policymakers to respond proactively as new information becomes available.

A couple of caveats on the scope of the toolkit and the interpretation of its output are in order. What it attributes to the financial/nonfundamental shock bundles the initial impulse as well as its propagation to different macroeconomic and financial variables, including potentially the shallowing of FX markets in response, as well as systematic responses by policymakers such as monetary policy and FXI. It cannot, however, identify a “pure shallowness” shock different from the financial shock, nor can it accommodate state-dependent amplification—the possibility that the same shock operates differently or makes certain policies like FXI more effective, when markets are already thin. These remain fruitful avenues for future exploration.

These findings reinforce the importance of a disciplined approach to FXI. Evidence indicating the influence of a financial shock may indicate that IPF use case A is relevant, but it is neither necessary nor sufficient by itself to justify the use of FXI. First, it is not necessary to the extent that even in the absence of a financial shock, FXI may be warranted on account of other use cases discussed in the introduction, namely, currency mismatches and unanchored inflation expectations. Second, even within the ambit of the first use case (stabilizing premia), the financial shock acts only as a necessary, but still not a sufficient condition for FXI, as explored further in the general principles presented in the IMF (2023). Any decision to intervene requires a broader assessment of factors that are beyond the scope of the toolkit, such as reserve adequacy, expected effectiveness (including relative to other policy instruments such as macroprudential policies), shock persistence, policy consistency, sterilization and balance sheet costs, signaling effects, and the risk of delaying needed macroeconomic adjustments. Reserve adequacy is highly uneven across countries, with some holding ample buffers while others lack sufficient reserves to manage shocks, underscoring the need for a careful cost–benefit analysis in decisions to intervene (IMF 2025). At the same time, for countries that operate a monetary policy framework based on floating rates, maintaining exchange rate flexibility remains crucial for facilitating adjustments to shocks and supporting macroeconomic stability (IMF 2023).

The framework developed in this note offers the potential to serve as a valuable resource for central banks and policymakers in EMDEs, supporting both ex post assessment of exchange rate movements and real-time policy analysis under the IPF. The note illustrates its application on a proof-of-concept basis for Brazil and Chile, two emerging market economies with floating regimes and relatively well-developed FX markets and rich data, as well as corroborating narrative evidence on select episodes, from both public and private sources. Extending it to other dimensions and building a repository would be the next fruitful avenue, with success depending critically on the availability and accuracy of underlying data (including survey-based expectations), and the ability to identify select episodes with convincing narrative evidence, as well as careful selection of variables to include in the analysis. Extending it to other dimensions (for example, time-varying volatility and shock transmission) would also be valuable for countries that face FX market dynamics that vary significantly over time.

Annex 1. UIP Correlations



Annex 2. Simulation Results to Motivate Sign Restrictions for the VAR

This annex provides the theoretical motivation for the impact of sign restrictions used to identify the financial shock in the toolkit (Table 2) and the interpretation of the decompositions it achieves when applied to actual data. It begins with the canonical model of Itskhoki and Mukhin (2021, henceforth IM). It first develops the argument under IM's assumption that the price of currency risk (risk-bearing capacity of financial intermediaries) is constant, deriving the sign restrictions and illustrating them with simulated data. It then asks how the analysis changes if that price is allowed to vary over time and concludes that the sign restrictions still continue to capture movements in exchange rates that are not driven by fundamentals.

A constant price of risk: From the UIP premium to the sign restrictions

The starting point is the definition of the UIP premium used throughout the note. Let e_t denote the (log) exchange rate, expressed as the local currency price of foreign currency so that an increase in e_t is a depreciation. The premium λ_t is the expected excess return from holding the domestic currency, and it has two components—the interest rate differential and the expected depreciation:

$$\lambda_t = (i_t - i_t^*) - (E_t e_{t+1} - e_t) \quad (2.1)$$

In models with imperfect financial intermediation, the UIP premium can be written as the product of the price of currency risk and the quantity of currency risk that the market must absorb. The financial market equilibrium in IM (their equation 16) takes exactly this form:

$$\lambda_t = \mu \cdot [(n/\beta) \psi_t - \bar{Y} b_{t+1}] \equiv \mu \cdot X_t \quad (2.2)$$

which is the partial-equilibrium relation $\text{UIP} = \mu X$, common to this class of models. The price of currency risk $\mu > 0$ collects the shadow cost of expanding intermediaries' balance sheets and the volatility of the exchange rate (formally, $\mu = \sigma \sigma_e^2 / \bar{m}$, the product of intermediaries' effective risk aversion $\sigma \bar{m}$ and the exchange rate variance σ_e^2). In IM, this price is a constant parameter; we treat it as such for now and return to the time-varying case as discussed in the following section. The quantity X_t is the net demand for foreign- relative to domestic-currency assets that intermediaries must absorb. It has two parts: a nonfundamental component ψ_t —the excess currency demand of noise traders, unrelated to fundamentals—and the household bond position b_{t+1} . The position is endogenous: it can respond to financial shocks and to fundamentals such as productivity or the

terms of trade, so fundamentals can reach the premium through this position channel. The analytical sign result as discussed in the following section follows IM's transparent benchmark in which μ is constant and the position channel is either shut down or quantitatively small on impact. In that benchmark, the premium is driven by the direct demand term, and the financial shock is the nonfundamental currency demand ψ_t .

To turn this into restrictions on observable variables, the model can be solved for the two components of the premium as functions of the underlying shocks. Letting z_t denote a fundamental (for example, productivity) shock, the solution takes the following form:

$$i_t - i_t^{\$} = -\alpha_1 z_t + \beta \psi_t \quad (2.3)$$

$$E_t e_{t+1} - e_t = -\alpha_2 z_t - \gamma \psi_t, \quad (2.4)$$

where $\alpha_1, \alpha_2, \beta, \gamma > 0$ are positive coefficients. Each collapses a combination of structural parameters of the model—preferences, the persistence of shocks, and the degree of intermediation friction—but only their signs matter for identification. The coefficients α_1 and α_2 govern the transmission of a fundamental shock to the interest rate differential and to the expected depreciation; both are positive, so a fundamental shock moves the two components in the same direction. The coefficients β and γ govern the transmission of the financial shock and enter with opposite signs. Because the financial shock operates through the intermediation channel, β and γ are proportional to the price of risk μ —here, the constant scale factor in (2.2)—so a higher price of risk does not change the sign of the financial shock's effect but makes it more potent. The fundamental coefficients α_1 and α_2 are governed mainly by the household intertemporal condition; their difference $\alpha_2 - \alpha_1$ is the residual imprint of fundamentals on the premium in this benchmark.

These signs deliver the key distinction. A fundamental shock moves the interest rate differential and the expected depreciation in the same direction ($-\alpha_1 z_t$ and $-\alpha_2 z_t$, with $\alpha_1, \alpha_2 > 0$); because the premium in (2.1) is the difference between the two components, these movements largely cancel, and the fundamental shock leaves only a limited imprint on the premium, governed by $\alpha_2 - \alpha_1$. A financial shock does the opposite: it raises the interest rate differential ($+\beta \psi_t$) while leading the currency to be expected to appreciate ($-\gamma \psi_t$), so the two components move in opposite directions and reinforce each other in the premium. A positive financial shock therefore depreciates the currency on impact while simultaneously raising the interest rate differential and the expected return on the domestic currency—the configuration of an adverse financial shock. This contrast—

same-direction co-movement of the two components for a fundamental shock, opposite-direction co-movement for a financial shock—is the heart of the impact restrictions described in Table 2.

Simulated impulse responses from the IM model confirm the validity of the sign restrictions. Annex Figure 2.1 reports the impact responses of the UIP premium and its components to three shocks drawn from the IM model: a financial shock (panel 1) and two fundamental shocks commonly used in macroeconomic models—a monetary policy shock (panel 2, a deviation from the interest rate rule) and a productivity shock (panel 3). In the case of the financial shock, a larger interest rate differential is associated with a depreciation on impact and an expected appreciation of the home currency thereafter (panel 1): the underlying disturbance is an increase in demand for foreign- relative to domestic-currency bonds, which must be accompanied by a positive expected return on home-currency bonds even after accounting for the exchange rate movement. The higher interest rate differential and the expected appreciation both contribute to offering investors this higher compensation for continuing to hold domestic currency assets. By contrast, the fundamental shocks do not reproduce this regularity: they imply a positive co-movement between expected depreciation and the interest rate differential on impact (panels 2 and 3), so the two components largely offset in the premium.

This pattern is not specific to the IM model. As discussed in Emeksiz and others (2026), it holds across a broad class of models in which financial factors are important drivers of exchange rates. Annex Figure 2.2 illustrates this by showing that the financial shock produces the same qualitative pattern in the components of the UIP premium in the quantitative IPF model of Adrian and others (2021). The comparison also shows that, while these models agree on the qualitative impact responses of the UIP premium and its components, they often differ in the dynamic profile of the responses at longer horizons. For this reason, the sign restrictions in Table 2 are imposed only on impact responses, which are robust across this class of models.

A time-varying price of risk

IM treat the price of risk μ as a constant. It is natural to ask whether a disturbance to μ itself—a tightening of intermediaries' risk-bearing capacity or a rise in exchange rate volatility, which is how the literature often pictures a “financial shock”—would also be captured by the sign restrictions, and whether allowing μ to vary changes the analysis as discussed in the previous section. The answer turns on the net currency position. Around the symmetric steady state that IM adopt, with zero net foreign assets, the steady-state quantity is $\bar{X} = 0$, and a first-order expansion of the premium gives

$$d\lambda_t = \bar{\mu} \cdot dX_t + \bar{X} \cdot d\mu_t = \bar{\mu} \cdot dX_t \quad (2.5)$$

because the price term $\bar{X} d\mu_t$ vanishes. A time-varying price of risk, therefore, has no first-order effect on the premium in this benchmark: the premium is driven entirely by the quantity X_t , and the analysis is identical to the constant- μ case. In the symmetric economy, in other words, IM's constant- μ assumption is innocuous—nothing is lost by it at first order.

The price channel becomes operative once the net currency position is nonzero, $\bar{X} \neq 0$, as is typical for EMDEs that carry net foreign currency exposure. Then, the term $\bar{X} d\mu_t$ in (2.5) survives, and a shock to the price of risk moves the premium in proportion to the existing net position. IM do not model such a shock directly, so the discussion that follows should be read as an extension of their equilibrium logic rather than as a separate impulse response in the baseline model. The question is: if a nonfundamental disturbance to μ opens a positive UIP wedge while fundamentals are held fixed, how would that wedge be split between the interest rate differential and the expected depreciation?

To see the split concretely, hold fundamentals fixed. The Euler condition then links the interest rate differential to the expected depreciation:

$$i_t - i_t^{\$} = -\gamma\sigma\kappa_q \cdot (E_t e_{t+1} - e_t), \quad (2.6)$$

where the positive composite $\gamma\sigma\kappa_q > 0$ summarizes the household side of the model: it combines the relative risk aversion σ —which governs the consumption-smoothing motive and hence how strongly the interest rate responds to the expected consumption growth—with the elasticity (κ_q) that links relative consumption to the real exchange rate, itself shaped by home bias in consumption and the elasticity of substitution between home and foreign goods. Let the μ shock open a wedge of size W in the premium, so that $\lambda_t = W > 0$. Combining this with the premium identity (2.1)—that is, with $W = (i_t - i_t^{\$}) - (E_t e_{t+1} - e_t)$ —and with the Euler condition (2.6) gives two equations in the two components, whose solution is

$$E_t e_{t+1} - e_t = -W(1 + \gamma\sigma\kappa_q) < 0, \quad i_t - i_t^{\$} = \gamma\sigma\kappa_q \cdot W(1 + \gamma\sigma\kappa_q) > 0. \quad (2.7)$$

The expected depreciation turns negative—the currency is expected to appreciate—while the interest rate differential rises. The two components move in opposite directions and reinforce one another in the premium: the same configuration the sign restrictions assign to an adverse financial shock. This result is conditional on the thought experiment just described: the μ shock is nonfundamental; it raises the UIP wedge W , and it is not bundled with contemporaneous fundamental or policy disturbances. Under those conditions, the split depends

on the Euler-condition coefficient $\gamma\sigma\kappa_q$ rather than on whether the wedge was opened by a quantity shock ψ or by a price-of-risk shock μ . The sign of W mirrors the net position: with $\bar{X} > 0$ —a net foreign currency debtor, the typical EMDE stress case—a rise in μ raises the premium, $W > 0$, delivering the adverse pattern just described; with $\bar{X} < 0$, the same shock lowers the premium, the favorable counterpart, while preserving the opposite-direction co-movement of the two components.

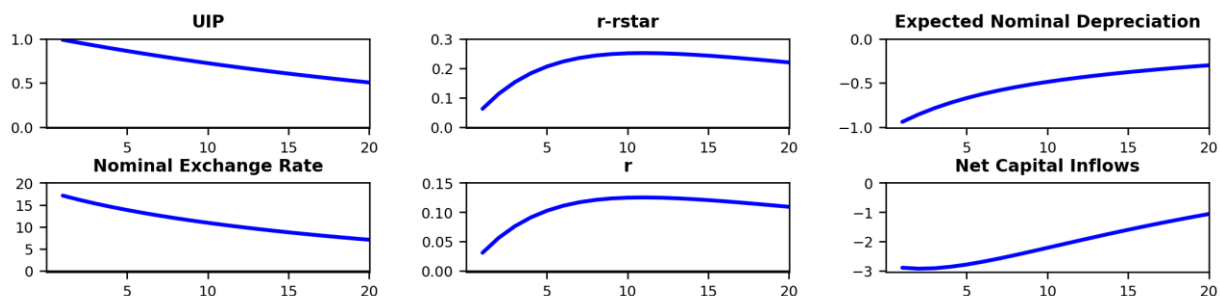
The sign restrictions identify a reduced-form intermediation wedge: movements in the UIP premium that have the financial-shock sign pattern. In IM's symmetric benchmark, this wedge is generated by the quantity of currency risk, ψ_t , because μ is constant and $\bar{X} = 0$. Away from that benchmark, a nonfundamental price-of-risk shock can be classified in the same financial category when it opens the wedge with the same impact signs. But the empirical exercise does not separately identify μ and X , and it need not capture all time variations in μ if the variations are bundled with fundamentals, policy responses, or changes in the fundamental component of currency demand.

This mapping also clarifies how to read the headline decomposition—in particular, that financial shocks account for only a minority of the variation in UIP premia. Two points are worth emphasizing. First, the empirical framework does not separately identify the price of risk μ and the quantity of currency demand X ; what the sign restrictions and narrative anchors isolate is the reduced-form intermediation wedge, the component of UIP and exchange rate movements that behaves like a shock operating through the intermediation channel. That wedge may be driven by nonfundamental demand, and in economies with nonzero positions, it may also be driven by the price of risk, but only insofar as the observed movement has the identified sign pattern. The result should therefore be read as a statement about the size of this classified wedge, not as evidence that the price of risk is stable.²¹ Second, the complement—the variation not attributed to the financial shock—should not be equated with fundamentals alone. As equations (2.3)–(2.4) make clear, fundamentals do move the premium, through $\alpha_2 - \alpha_1$; the complement also includes measurement errors in the inputs to the premium (survey-based expectations are noisy and interest differentials embed local credit risk) and nonfundamental price- or quantity-side movements that the restrictions do not cleanly classify. The estimated financial-shock share is accordingly best understood as a conservative reading of the role of intermediation frictions.

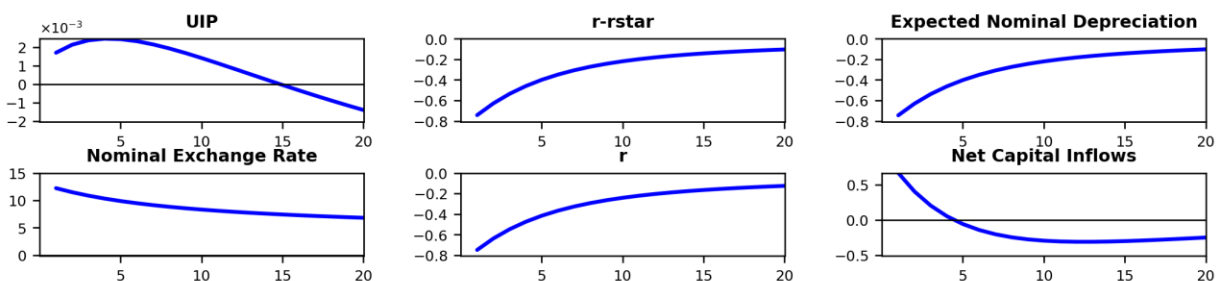
²¹ Further disentangling the role of these two drivers using a more targeted empirical design remains a fruitful avenue for future work.

Annex Figure 2.1. Simulated Impulse Responses from a Theoretical Benchmark (Itskhoki and Mukhin 2021) to Motivate Sign Restrictions

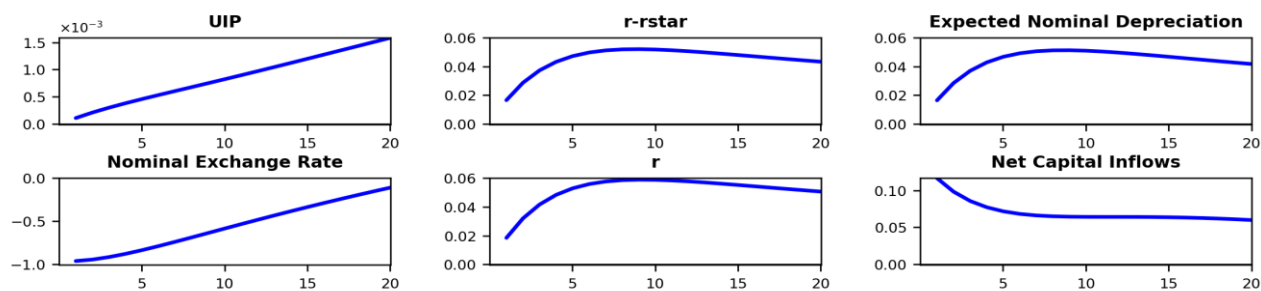
1. Financial Shock



2. Monetary Shock

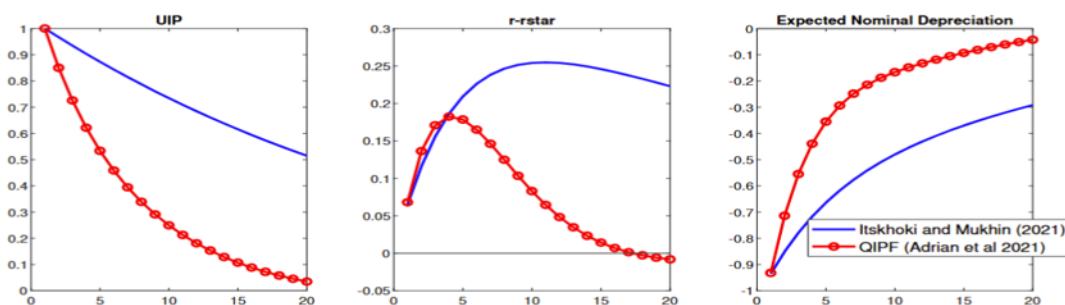


3. Productivity Shock



Note: The simulations are based on the baseline calibration in Itskhoki and Mukhin (2021).

Annex Figure 2.2. Main Qualitative Sign Patterns Are Common across Benchmark Models

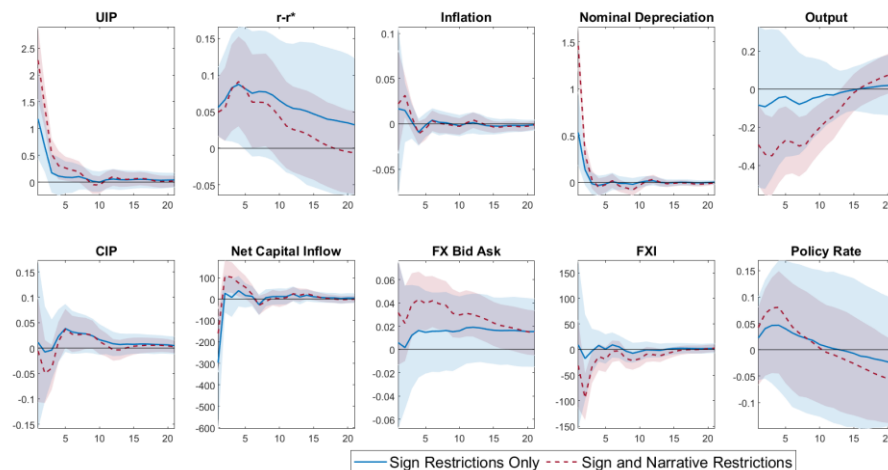


Note: The figure shows impulse responses to a financial shock under the baseline calibration in Itskhoki and Mukhin (2021) and Adrian and others (2021). The size of the shock is normalized so that UIP rises by 1 percentage point on impact.

Annex 3. Additional VAR Results

3.1 Propagation of Financial Shock with and without Narrative Restrictions

Annex Figure 3.1. Applying the Toolkit for Chile: Narrative Restrictions Make a Key Difference



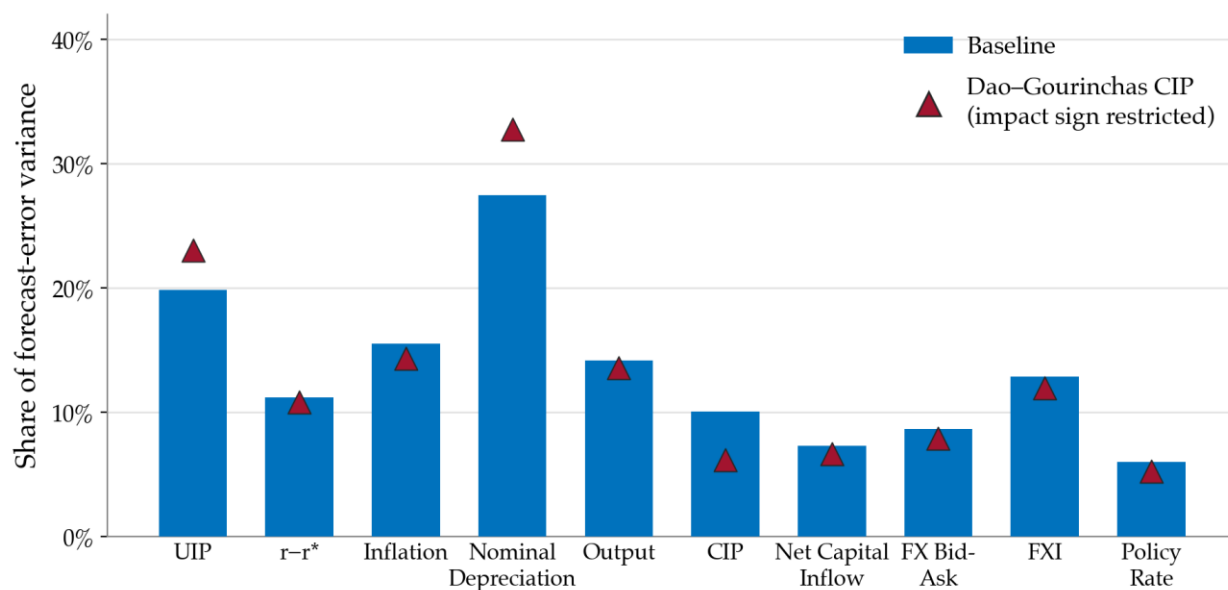
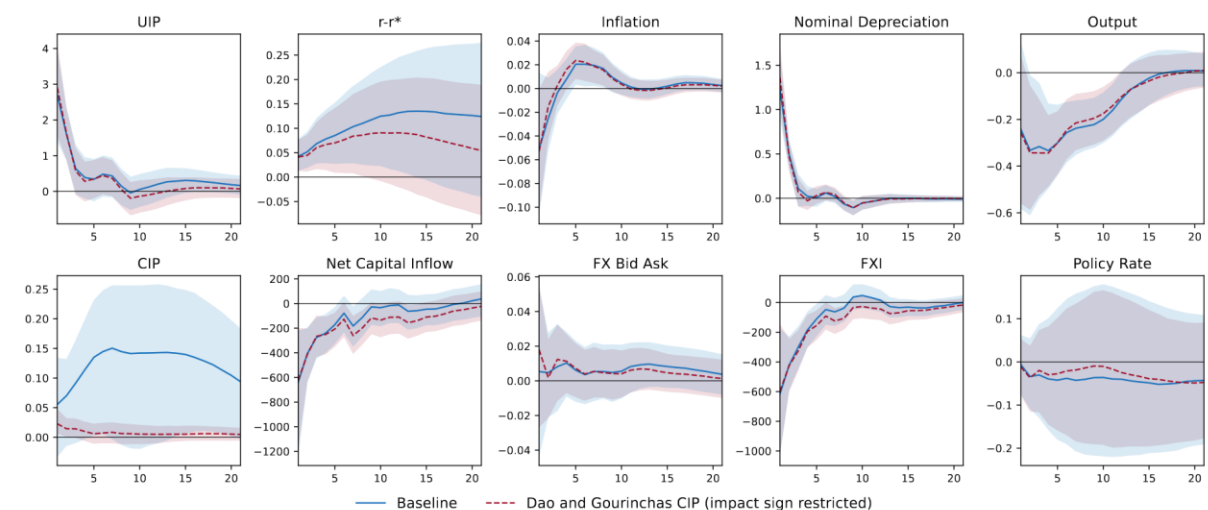
Note: Based on a 10-variable monthly VAR with 12 lags. Lines denote medians and shaded regions denote the 16th–84th percentile range based on the posterior distribution. See Emeksz and others (2026) for full details on the sample and estimation.

3.2 Robustness of Baseline Results for Brazil Using the CIP Measure of Dao and Gourinchas (2026)

Dao and Gourinchas (2026) show that, unlike in advanced economies, the CIP basis in emerging markets is not a clean gauge of intermediation frictions: a sizable part of it reflects local credit risk rather than the balance sheet constraints faced by financial intermediaries. To separate the two, they construct a “purified” CIP basis from supranational bonds issued in local currency, which strips out the local credit-risk component and isolates the financial intermediation component more cleanly. This purified series is available for Brazil but not for Chile. We therefore reestimate the Brazil VAR, replacing our baseline CIP measure—constructed from onshore interbank rates—with the purified Dao and Gourinchas (2026) basis and ask whether the identified financial shock is sensitive to how the CIP basis is measured. In addition to the sign and narrative restrictions in Table 2, the robustness check also imposes a restriction that exploits the cleaner financial content of the purified measure: the purified CIP basis is required to rise on impact in response to a financial shock.

As shown in Annex Figure 3.2, the estimated financial shock is essentially unchanged across both specifications: its impulse responses and its contributions to the UIP premium and to nominal depreciation stay very close to the baseline, confirming that our findings for Brazil do not hinge on the choice of CIP measure or on the additional restriction.

Annex Figure 3.2. Financial Shock for Brazil, Comparing Alternative CIP Measures



Note: Impulse responses and variance decompositions. Based on a 10-variable monthly VAR with 12 lags. Lines denote medians and shaded regions denote the 16th–84th percentile range based on the posterior distribution. Bars and triangles in the bottom panel denote the share of the financial shock in explaining the variance of the respective variable over the full sample. See Emeksiz and others (2026) for full details on the sample and estimation. The figure compares the baseline VAR with the one using CIP from Dao and Gourinchas (2026). $r - r^*$ denotes the difference between domestic and dollar interest rates.

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