# International Risk Spillovers: Implications for Emerging Markets' Monetary Policy Frameworks with an Application to Chile

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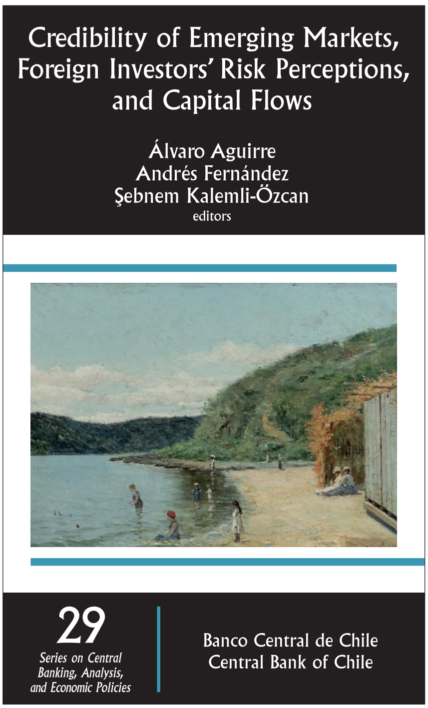



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# International Risk Spillovers: Implications for Emerging Markets' Monetary Policy Frameworks with an Application to Chile

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Among the factors behind international spillovers, U.S. monetary policy developments retain a major influence. Such developments drive the global financial cycle as strongly demonstrated by Rey (2013), Miranda-Agrippino and Rey (2020), Miranda-Agrippino and Rey (2021). The dramatic U.S. monetary easing during the early months of the Covid-19 pandemic was the single most important factor for the reversal of capital outflows to emerging markets and developing economies.[1] As shown by Kalemli-Özcan (2019), the transmission mechanism for monetary policy spillovers to emerging market economies (EMEs) rests on the effect of U.S. monetary policy on investors' risk sentiments, as those sentiments are more volatile in the case of EMEs. In Kalemli-Özcan (2019), I show that capital flows to emerging markets are particularly "risk-sensitive." This creates a challenge unique to the EME policymakers and their monetary policy frameworks.

Building on and updating my prior work, in this paper I argue that EME policymakers should smooth out this risk sensitivity by not using policy rates but other policy tools instead. A good barometer of this risk sensitivity is the uncovered interest rate parity (UIP) risk premia and, if EME policymakers use policy rate to respond to U.S. monetary policy changes, the UIP risk premia increase further.

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1. See Kalemli-Özcan (2021), Obstfeld (2021).

*Credibility of Emerging Markets, Foreign Investors' Risk Perceptions, and Capital Flows* edited by Álvaro Aguirre, Andrés Fernández, and Şebnem Kalemli-Özcan, Santiago, Chile. 

This happens because, when U.S. tightens, an emerging market that wants to use monetary policy to limit exchange-rate volatility needs to implement a much larger increase in the domestic policy rate, since U.S. tightening increases the UIP risk premia. Such a large increase in the policy rate can be counterproductive by increasing risk premia further through higher credit costs, spreads, and country risk with dire consequences for the real economy. As a result, the case for flexible exchange rates is stronger under international risk spillovers, since floating exchange rates help to smooth out the UIP risk premia, thus freeing domestic monetary policy's hand to focus on inflation targeting and output stabilization.[2]

Countries may want to limit exchange-rate volatility because of the negative effects of excessive volatility on balance sheets due to extensive debt denominated in foreign currency and/or a high degree of passthrough of currency depreciations to inflation. Calvo and Reinhart (2002) documented a pervasive "fear of floating," where the 'fear' is linked to liability dollarization in EMEs. Burstein and Gopinath (2014) have documented a higher degree of inflation passthrough in EMEs relative to advanced countries. Recent research shows that monetary policy credibility helps to reduce the high degree of passthrough from exchange-rate fluctuations to inflation.[3]

For "fear of floating" linked to foreign-currency debt, countries can limit the extent of foreign-currency debt by using countercyclical prudential policies. Macroprudential and capital-flow management policies can be used countercyclically in a transitory way, to limit unhedged foreign-currency-denominated liabilities not only in the financial sector, as typically done, but also in the nonfinancial corporate sector.[4] The rationale for these policies is to reduce foreign-currency-denominated debt and hence to provide insulation from spillovers that arise from balance-sheet effects of exchange-rate fluctuations with large levels of unhedged foreign-currency-denominated debt. In a monthly panel of over 40 emerging markets since the 2000s, Das and others (2022) find evidence that countercyclical preemptive

2. See Akinci and Queralto (2019) for a model of spillovers from the U.S. to a small open economy with UIP deviations where welfare gains are higher under floating exchange rates. See also Kalemli-Özcan (2019) who shows that free floating EMEs do not experience the negative effects of VIX shocks on GDP growth, whereas EMEs with managed floats do.

3. For example, López-Villavicencio and Mignon (2017), and Carrière-Swallow and others (2021).

4. For example, Basu and others (2020).

macroprudential and capital-flow-management policies reduce foreign-currency debt accumulation and hence lower the UIP premia during risk-off shocks. For the long term, improvements in the quality and transparency of institutions will reduce idiosyncratic country risk and reduce the sensitivity of capital flows in EMEs to global risk premia and foreign investors' risk perceptions. These policies will also provide the credibility needed for implementing desirable countercyclical macroprudential and capital-flow management policies to dampen the international risk spillovers.

In section 1, I document the strong correlation between risk sentiments of foreign investors and capital inflows to EMEs. Section 2 investigates the effects of exogenous shocks to U.S. monetary policy on EMEs' risk premia, UIP and covered interest rate parity (CIP) deviations, and EMEs' domestic monetary policy response. Section 3 presents the case of Chile and Section 4 concludes.

## 1. Risk Sentiments and Capital Flows

There is a large literature that shows that, in EMEs, net capital flows—capital inflows by foreigners (liabilities) minus capital outflows by domestic residents (assets), equivalently the current account with a reverse sign—are mainly driven by the actions of foreign investors, that is, by the liabilities side or inflows.[5] These capital inflows can be positive or negative during any given quarter, as foreign investors can increase or reduce their financial exposures to a given country. Thus, I focus on these 'gross' capital inflows—what foreigners bring in and what they take out—from the International Monetary Fund's (IMF) Balance of Payments database. Capital inflows are reported both in total and by their components: Foreign Direct Investment (FDI) flows, Portfolio Equity flows, Portfolio Bonds flows, and Other Investment flows. As shown by Avdjiev and others (2022), the largest component of capital flows is debt flows (portfolio bond flows and other investment flows), both for advanced economies (AEs) and EMEs. In addition, global financial intermediaries have an important role in intermediating capital flows between countries (as opposed to direct access to equity markets in lender countries by borrower countries). For these reasons, I focus on total debt flows. From the IMF, Balance of Payments Statistics, and from Avdjiev and others (2022), I have

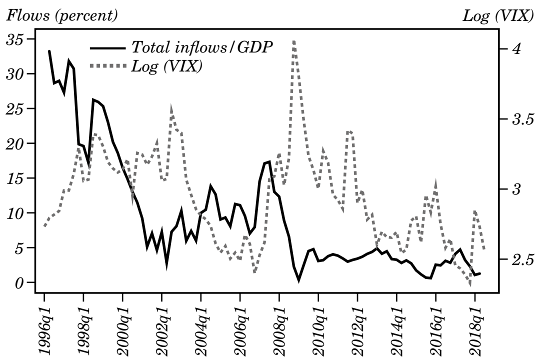
5. Bluedorn and others, 2013; Avdjiev and others, 2022.

quarterly data on capital inflows from 1996 until the end of 2019 for 55 EMEs.

How big of a role do risk sentiments play for capital inflows into EMEs? As shown in chart 1—updated from Kalemli-Özcan (2019) till the end of 2019, plotting the relationship between the VIX and capital inflows into EMEs—,[6] the VIX has an important negative effect on capital inflows to EMEs. Miranda-Agrippino and Rey (2021) show that this relationship is explained by the same global factor that explains the global financial cycle.

The mapping from the changes in U.S. monetary policy to the VIX is not straightforward. As shown by Bekaert and others (2013), Miranda-Agrippino and Rey (2019), and Bruno and Shin (2015), a higher U.S. rate increases the VIX. However, as shown by Rey (2013), there is a feedback effect, and a higher VIX induces an expansionary U.S. policy. As shown above, capital inflows to EMEs move with the VIX, and Kalemli-Özcan (2019) also showed that EME domestic monetary policy responds to such movements. Hence, I will investigate the effect of *exogenous* U.S. monetary policy shocks on risk premia in EMEs, next.

**Figure 1. Risk Sentiments and Capital Flows in EMEs**




Source: Author's calculations.
Notes: Capital flows are normalized by GDP and plotted as three-quarter moving averages, and these flows are averaged across countries on a given date.

6. The VIX is a forward-looking volatility index of the Chicago Board Options Exchange. It measures U.S. investors' expectation of 30-day volatility and is constructed by using the volatilities implied by a wide range of S&P 500 index options. This chart is updated from Kalemli-Özcan (2019).

## 2. U.S. Monetary Policy, Risk Premia, and Policy Response

The conventional models imply that domestic credit costs should respond to monetary policy actions, and this response should depend on the expected path of the central bank's policy instrument, which is the short-term interest rate. Gertler and Karadi (2015) argue that, in the presence of financial frictions, the response of credit costs to monetary policy may in part reflect movements in term premia and credit spreads. By using high-frequency identification (surprises in Fed-funds futures occur on FOMC days in a thirty-minute window of the monetary policy announcement), they can rule out the simultaneity of economic news and monetary policy and hence prevent risk premia being 'priced-in' before the announcement.

I use these U.S. monetary policy surprises in a local projections framework—which is shown to estimate the same impulse response functions (IRFs) as the VAR by Plagborg-Møller and Wolf (2021). I implement local projections with instrumental variables (LP-IV) following Jorda (2005), and Stock and Watson (2018). I run the following regressions for EMEs:

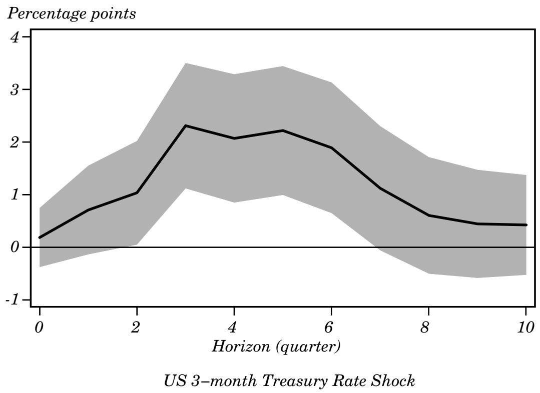
$$(i_{c,t+h} - i_{US,t+h}) = \alpha_c + \beta_h \hat{\imath}_{US,t} + \beta_h^{\omega} W + \varepsilon_{c,t+h}, \quad h = 0,1,2,3...$$

where $(i_{c,t+h} - i_{US,t+h})$ is the 12-month government bond spreads at time $t+h$ in a given country $c$, vis-a-vis the U.S. $\alpha_c$ is a country-fixed effect, $\hat{\imath}_{US,t}$ is the estimated exogenous U.S. monetary policy shock at time , and $\beta_h$ is the associated impulse response coefficient.

Chart 2 presents the results, updated from Kalemli-Özcan (2019). In EMEs, spreads increase by 2.2 percentage points after three quarters in response to a 1 percentage point increase in U.S. monetary policy rate.[7] Notice that these are short-term spreads, which means that the risk spillovers do not necessarily come from the term premia in EME. Degasperi and others (2020) show that a similar mechanism is at work for advanced countries working via term premia at the long end of the yield curve. Gourinchas and others (2021) also show increasing government and corporate-bond spreads in EMEs as a response to U.S. monetary policy contractions, where they use the policy surprises directly.

7. Kalemli-Özcan (2019) shows that the pattern is opposite for advanced countries; the spreads decrease by about 0.5pp after one quarter and 1.7pp after six quarters.

**Figure 2. Responses of 12-month EME Government Bond Spreads to U.S. Monetary Policy Shocks**

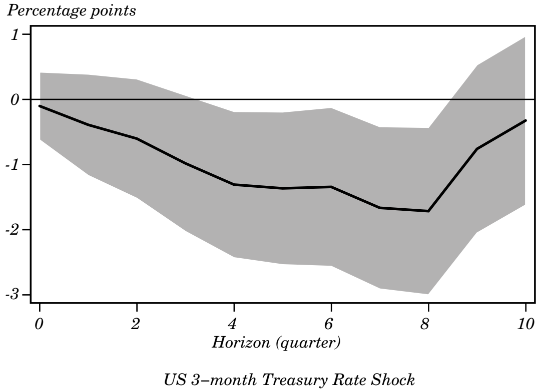



Source: Author's calculations.
Notes: Impulse responses are obtained from panel local projections of 79 EMEs. 95 percent confidence intervals (calculated by using Newey-West standard errors) are shown by the shaded areas. The U.S. policy (3-month treasury rate) is instrumented by Gertler-Karadi shock FF4 (estimated from surprises in 3-month Fed-fund futures).

How does EME domestic monetary policy respond? We cannot be sure if the patterns above are due to rising risk premia of EMEs or a procyclical response of EME domestic monetary policy to contractionary U.S monetary policy.[8] Chart 3 shows that this is not the case. On the contrary: EMEs, on average, run a countercyclical monetary policy as a response to contractionary U.S. monetary policy and lower their policy rates. Consistent with the findings of Kalemli-Özcan (2019), who shows a short rate disconnect—less than full passthrough between monetary policy rates and short-term market interest rates—in EMEs, here also it is clear that EME monetary policy can be ineffective in smoothing the risk premia. Although EME policymakers lower the policy rates as a response to a contractionary U.S. monetary policy shock, on average, EME risk premia still rise.

8. I would like to thank Helene Rey, who raised this point during her discussion of Kalemli-Özcan (2019)

**Figure 3. Responses of EME Policy Rates to U.S. Monetary Policy Shocks**




Source: Author's calculations.

## 3. U.S Monetary Policy and UIP Risk Premia

I argue that a good barometer to measure the relation between the U.S. monetary policy and changes in EME risk premia is the fluctuations in UIP premia, that is, dynamic UIP deviations. The standard UIP condition can be stated as follows:

$$E_t[S_t + h]\ (1 + i_{US,t}) = S_t\,(1 + i_{c,t}), \tag{1}$$

where $t$ denotes time and $h$ is the horizon considered. $S_t$ and $E_t[S_{t+h}]$ are the spot exchange rate at time $t$ and the expected (as of time $t$) exchange rate for h months ahead, respectively. The exchange rate is denominated in units of local currency per U.S. dollar. In turn, $i_{c,t}$ and $i_{US,t}$ are the domestic and U.S. interest rates with the same time horizon for the maturity of the debt as the expected exchange rate. By using equation (1), we express the UIP deviation in logs as,

$$\lambda \equiv i_{c,t} - i_{US,t} - [s^{e}_{t+h} - s_t], \tag{2}$$

where $\lambda_t$ denotes the UIP deviation for the domestic currency with respect to the U.S. dollar. Under this specification, a $\lambda_t$ equal to zero implies that the UIP condition holds and interest-rate differentials and expected exchange-rate movements offset each other fully. Otherwise, if there are positive UIP deviations, there are positive expected excess returns on the domestic currency.

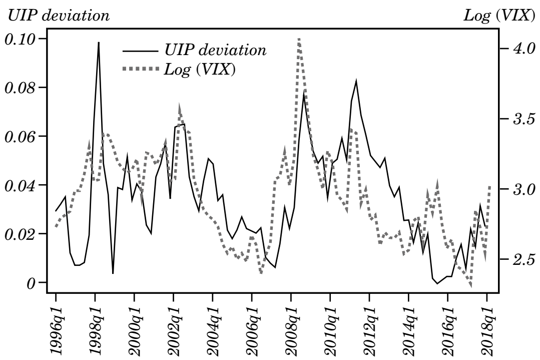
Chart 4 plots the median UIP deviation, $\lambda$, for EMEs—reproduced from Kalemli-Özcan and Varela (2019).[9] The correlation is over 60 percent.

The reason why UIP premia are a good barometer is that, in EMEs, UIP deviations move with policy credibility-related country-specific risk, which is captured by interest-rate differentials, while in advanced countries, they move with global risk, captured by exchange-rate fluctuations, as shown in Kalemli-Özcan and Varela (2019) and replicated below:

$$\lambda_t \equiv \underbrace{i_{c,t} - i_{US,t}}_{\text{IR Differential}} + \underbrace{s_t - s^e_{t+h}}_{\text{ER Adjustment}}. \tag{3}$$

Chart 5 plots each part of this decomposition. The sources of the UIP deviations differ greatly as argued.

**Figure 4. Risk Sentiments and UIP Deviations**




Source: Author's calculations.

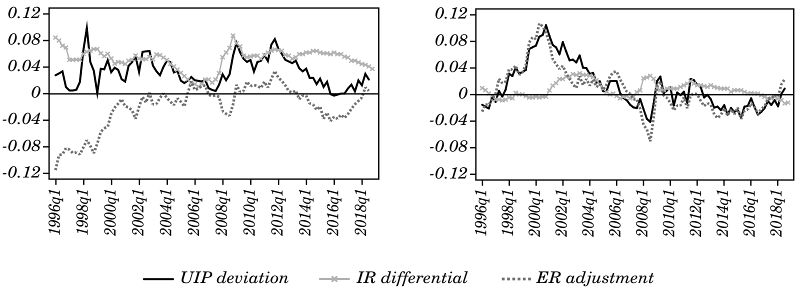
Notes: The figure plots UIP deviations using quarterly observations from 22 EMEs excluding hard pegs. The sample size is lower due to availability of data on expectations of exchange rates, which are obtained from Consensus Forecast. The UIP deviation is calculated as the difference between log interest-rate differentials and the gap between log expected and spot exchange rate. Log interest-rate differentials are the deposit rate differentials vis-a-vis the U.S. The log expected exchange rate is the 12-month ahead expected exchange rate as of month t and the log exchange rate is the spot rate, both nominal and in terms of local currency per U.S. dollar.

9. The dynamic relation between UIP and VIX is first shown by Di Giovanni and others (2022) for Turkey.

These different sources of the UIP deviations underlie the relation between the UIP risk premia and the U.S. policy shocks in EMEs. Chart 6 shows that the UIP deviations in EMEs increase by about 3 percentage points after two quarters in response to a 1 percentage point contractionary U.S. policy-rate shock in EMEs, whereas there is no response in AEs. The response of the UIP deviations implies that EMEs need to provide additional returns to investors to compensate for heightened country risk induced by the contractionary U.S. monetary shock. Hence, global investors expect and earn excess returns from EMEs.

## Figure 5. Sources of UIP Deviations

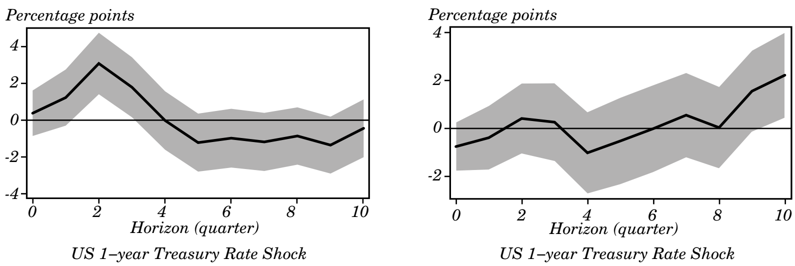
(*a*) *Emerging market economies* (*b*) *Advanced economies*




Source: Author's calculations.
Notes: The figure plots UIP deviations and components using quarterly observations from 22 EMEs and 12 AEs excluding hard pegs.

## Figure 6. Responses of UIP Risk Premia to U.S. Monetary Policy Shocks

(*a*) *Emerging market economies* (*b*) *Advanced economies*



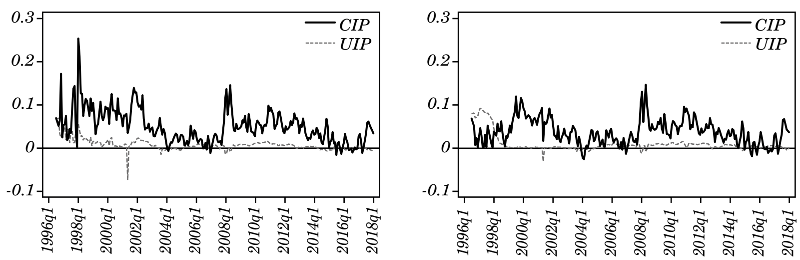

Source: Author's calculations.
Notes: Impulse responses of UIP deviations are obtained from panel local projections. The standard errors are Newey-West and given by the shaded areas. The U.S. 12-month treasury rate is instrumented by using the Gertler-Karadi policy shock (estimated from surprises in 3-month Fed-fund futures).

These movements in UIP premia with the U.S. monetary policy underlie the strong case for flexible exchange rates in EMEs. In terms of equation (2), it is easy to see that, when the U.S. interest rates rise, if also risk premia rise, the domestic monetary policy needs to adjust by raising the policy rates by a large margin if the domestic monetary authority also wants to stabilize the exchange-rate fluctuations. This will not be the case if UIP holds. If UIP holds, there is no role for risk premia in driving the procyclicality in UIP deviations and, although a central bank that wants to stabilize the exchange rates needs to increase the policy rate as a response to U.S. tightening, this increase does not have to be that big. By increasing domestic rates by a large margin, domestic monetary policy not only hurts the domestic economy but also has an impact on country-risk premium through tighter financial conditions, thus increasing the effects of international risk spillovers.

Can UIP deviations be capturing CIP deviations? CIP deviations stem from breaks in the arbitrage condition and can be related to UIP deviations. A UIP wedge can be there even in the absence of such a break in arbitrage if it is driven by risk premia as shown by Akinci and others (2022). This might be the reason why UIP failures are much larger than CIP failures, as they are driven by fluctuations in risk premia and not necessarily a break in arbitrage, as shown in chart 7, replicated from Kalemli-Özcan and Varela (2019).

**Figure 7. UIP vs CIP Deviations**

(*a*) *Deposit rates* (*b*) *Interbank rates*



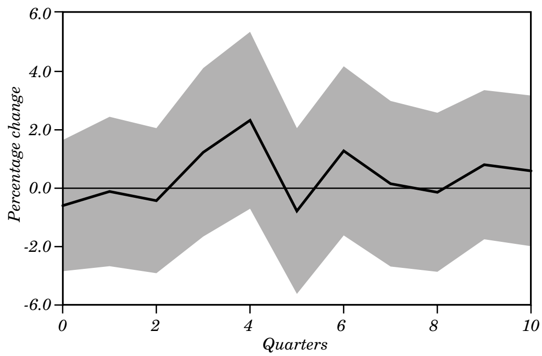

*Corr(CIP, UIP)* = 0.354 *Corr(CIP, UIP)* = –0.120

Source: Author's calculations.
Notes: The figure plots the same UIP deviations as before. CIP deviations are calculated by following Du and Schreger (2021) in panel (b) and using deposit rates as in UIP in panel (a).

## 4. The Case of Chile

In this section, I focus on the case of Chile. Chile has been a successful inflation targeter under a floating exchange-rate regime for some time. This means that we expect Chile's risk premia not to respond systematically to U.S. monetary policy shocks, and hence, our barometer UIP risk premia will also be unresponsive to these shocks. As shown in chart 8, this is exactly what we have found for Chile.

**Figure 8. UIP Premia Responses in Chile to U.S. Monetary Policy Shocks**




Source: Author's calculations.
Notes: This figure shows the response of the UIP premia to a U.S. monetary policy shock. For data restrictions, we use 12-month deposit rates instead of 12-month treasury rates as the relevant rates to construct the UIP premia. All other controls are the same. The time period spans from 1996.IV to 2016.IV.

## 5. Conclusion

U.S. monetary policy actions have the potential to spill over to any country as long as international investors' risk perceptions change with changes in U.S. monetary policy. Central bankers are increasingly confronted with the need to better understand and respond to fluctuations related to shifts in risk sentiments, and this can lead to disruptive financial conditions.

I show that UIP deviations are good barometers of such changes in risk sentiments in emerging markets as a response to changes in U.S. monetary policy. Domestic monetary policy can be ineffective under significant UIP deviations in emerging markets; that is, even if domestic policy responds countercyclically to changes in the U.S. policy, it cannot reduce the risk premia. Floating exchange rates can make monetary policy more effective by smoothing out these UIP risk premia. Chile is a case in point. Chile's UIP risk premia do not respond to changes in U.S. policy as its floating exchange rate absorbs such shocks.

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