Capital Flows and Monetary Policy in Emerging Markets around Fed Tightening Cycles

By Johannes Matschke, Alice von Ende-Becker, and Sai A. Sattiraju

The unprecedented size and rapid pace of the Federal Reserve's recent interest rate hikes—525 basis points from March 2022 to July 2023—have raised concerns about spillover effects on emerging market and developing economies. Historically, a higher U.S. federal funds rate (or a tightening of monetary policy) has been associated with international investors withdrawing capital from emerging markets, which can lead to lower economic activity and depreciating exchange rates in these markets—and, in turn, greater financial vulnerability.

To reduce capital outflows, central banks in emerging markets can tighten their own monetary policy rates to increase yields on debt securities. But raising interest rates comes with trade-offs: higher interest rates can reduce investments and thus slow economic growth. Moreover, if inflation is already at an emerging market's target rate, raising interest rates may contradict their domestic inflation mandate. Because of these trade-offs, how and why central banks in emerging markets respond to tighter monetary policy in the United States is still an empirical question.

We examine the three most recent U.S. policy tightening cycles to analyze when and why central banks in emerging markets raised their own policy rates. We find that while emerging markets sometimes raised rates in response to capital outflows or a depreciation of their

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currency resulting from U.S. monetary policy, they more frequently raised rates in response to domestic inflationary pressures. During the U.S. tightening cycle in 2004–06, initial rate hikes in the emerging markets in our sample were not well aligned with the start of the U.S. rate hikes, as most emerging markets responded to domestic inflationary pressures. However, during the start of the 2014–19 U.S. tightening cycle, several emerging markets responded to capital outflows or a depreciating exchange rate, while domestic inflationary pressures were mostly absent. During the most recent 2021–23 U.S. tightening cycle, all emerging market central banks in our sample increased their policy rate; most acted in response to domestic inflationary pressures, though many also experienced capital outflows. Taken together, these three tightening cycles suggest that central banks in emerging markets respond foremost to domestic inflationary pressures, but also to capital outflows and a depreciating exchange rate if necessary—a finding that provides new descriptive evidence on the conduct of monetary policy in emerging markets.

Section I examines how international capital flows react to changes in U.S. or emerging market policy rates. We show that tighter U.S. monetary policy leads to capital outflows from emerging markets, while a higher emerging market policy rate concurrent with a higher federal funds rate can reduce outflows. Section II explores the response of emerging market monetary policy to domestic inflation, capital flows, and the exchange rate during the three most recent tightening cycles.

I. Nonresident Capital Flows and Interest Rates

Emerging markets are more dependent on foreign capital flows than advanced economies and therefore are particularly exposed to financial spillovers from U.S. monetary policy. Interest rates in the United States transmit to emerging markets through financial flows, which affect the broader economy (see, for example, Ahmed and Zlate 2014; Fratzscher 2012; Forbes and Warnock 2012). Foreign investments in emerging markets—specifically, nonresident capital inflows—can, for example, spur economic growth when local financial markets are too small to adequately fund businesses. Capital flows also affect demand for foreign currency and thus the exchange rate. For example, if U.S. investors invest in an emerging market, financial flows will be converted to the

emerging market's currency, increasing demand for the currency and appreciating the exchange rate.

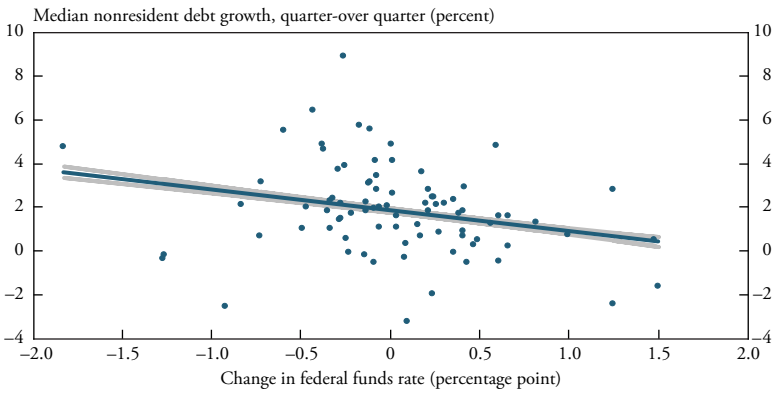
When the Federal Reserve raises the federal funds rate, international investors tend to cut back on their foreign investments through two channels. First, tighter U.S. monetary policy increases the interest rate differential between the United States and emerging markets, which makes U.S. debt securities more attractive to investors than securities in emerging markets (Bräuning and Ivashina 2020). Second, tighter U.S. monetary policy reduces risk-taking, as banks tighten lending standards after a hike in U.S. interest rates (see, for example, Miranda-Agrippino and Rey 2020; Kalemli-Özcan 2019; Bruno and Shin 2015). Because investments in emerging markets are perceived to be risky, investments in emerging markets tend to fall more than investments in advanced economies after an increase in U.S. interest rates (even controlling for the interest rate differential).

Chart 1 shows that a higher federal funds rate indeed leads to a smaller growth rate in nonresident debt invested in emerging markets. We focus on a sample of 22 emerging markets that are not subject to heavy capital controls, making them particularly sensitive to international capital flows.[1] We plot the quarterly change in the federal funds rate against the median quarterly growth rate in nonresident debt across emerging markets since 2002; a positive value implies inflows, while a negative value implies outflows.[2] We focus on debt investments because they account for most nonresident flows to emerging markets and are more sensitive to interest rates than other sources of investments (Avdjiev and others 2022).[3] Overall, the relationship between changes in the federal funds rate and foreign debt inflows is negative; that is, tighter U.S. monetary policy slows growth in debt inflows in emerging markets and eventually leads to outflows. These outflows can have adverse effects on emerging markets' financial conditions, the exchange rate, and the broader macroeconomy (see, for example, Loipersberger and Matschke 2022; Calvo and Reinhart 2002).

Central banks in emerging markets can attempt to reduce capital outflows by raising their own policy rate. In the short term, a higher policy rate in an emerging market increases the return on credit, giving investors a stronger incentive to invest. Thus, if a central bank in

Chart 1

Nonresident Debt Growth in Emerging Markets Has a Negative Relationship with Changes in the Federal Funds Rate



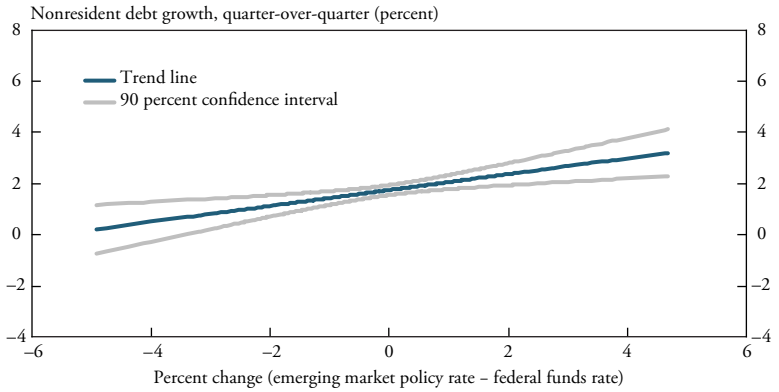
Notes: Dots indicate individual observations. The blue line represents the linear relationship between the two variables. Gray lines represent 90 percent confidence bands around the line of best fit. We use the shadow rate in Wu and Xia (2016) to proxy the effective federal funds rate at the zero lower bound over the sample period 2002–22.
Sources: International Monetary Fund (Haver Analytics), Board of Governors of the Federal Reserve System, and authors' calculations.

an emerging market raises its policy rate—for example, in response to a higher federal funds rate—capital outflows may slow or even reverse. For Chart 2, we compute quarterly growth rates in nonresident debt and contrast this rate with the change in the interest rate differential (the emerging market policy rate minus the federal funds rate) over the same quarter for all emerging markets in our sample since 2002. Because of the large number of observations, we only plot a line-of-best-fit, including 90 percent confidence bands. The chart shows that an increase in the interest rate differential increases capital inflows to emerging markets or, alternatively, reduces outflows, though the relationship between the two is weaker than between the federal funds rate and foreign debt flows.

Overall, Chart 2 suggests that emerging markets can, at least in the near term, reduce financial outflows from higher U.S. interest rates. However, they may choose not to, as higher interest rates could be inconsistent with their domestic inflation mandate or their economic outlook more broadly. For example, raising the policy rate in an emerging market in response to capital outflows could have detrimental effects on the macroeconomy when inflation is below target or when output growth is weak.

Chart 2

Emerging Markets Can Slow Capital Outflows by Raising Their Own Policy Rates



Notes: The blue line represents the linear relationship between the two variables. Gray lines represent 90 percent confidence bands around the line of best fit. Individual observations are not plotted. Our sample period is 2002–22.
Sources: International Monetary Fund (Haver Analytics), emerging market central banks (Haver Analytics), Board of Governors of the Federal Reserve System, and authors' calculations.

II. Monetary Policy in Emerging Markets around Fed Tightening Cycles

Central banks in emerging markets face potential trade-offs if they respond to changes in U.S. interest rates, as U.S. monetary policy and resulting international capital movements could be out of sync with emerging markets' domestic economies. To better understand emerging markets' policy decisions, we first examine whether central banks in our sample of 22 emerging markets raised their policy rate around three previous series of U.S. rate hikes. Specifically, we use an event-study approach around the start of each of the last three U.S. tightening cycles: 2004:Q1, 2014:Q4, and 2021:Q4. We identify these quarters based on the first increase in the federal funds rate or the shadow rate—the effective policy rate when the federal funds rate is constrained by the zero lower bound (Wu and Xia 2016). Because monetary policy changes are often signaled in advance, the shadow rate starts to increase before the Federal Reserve announces any change to the funds rate. Consequently, the start of the 2014–19 and 2021–23 U.S. tightening cycles preceded actual changes in the federal funds rate.

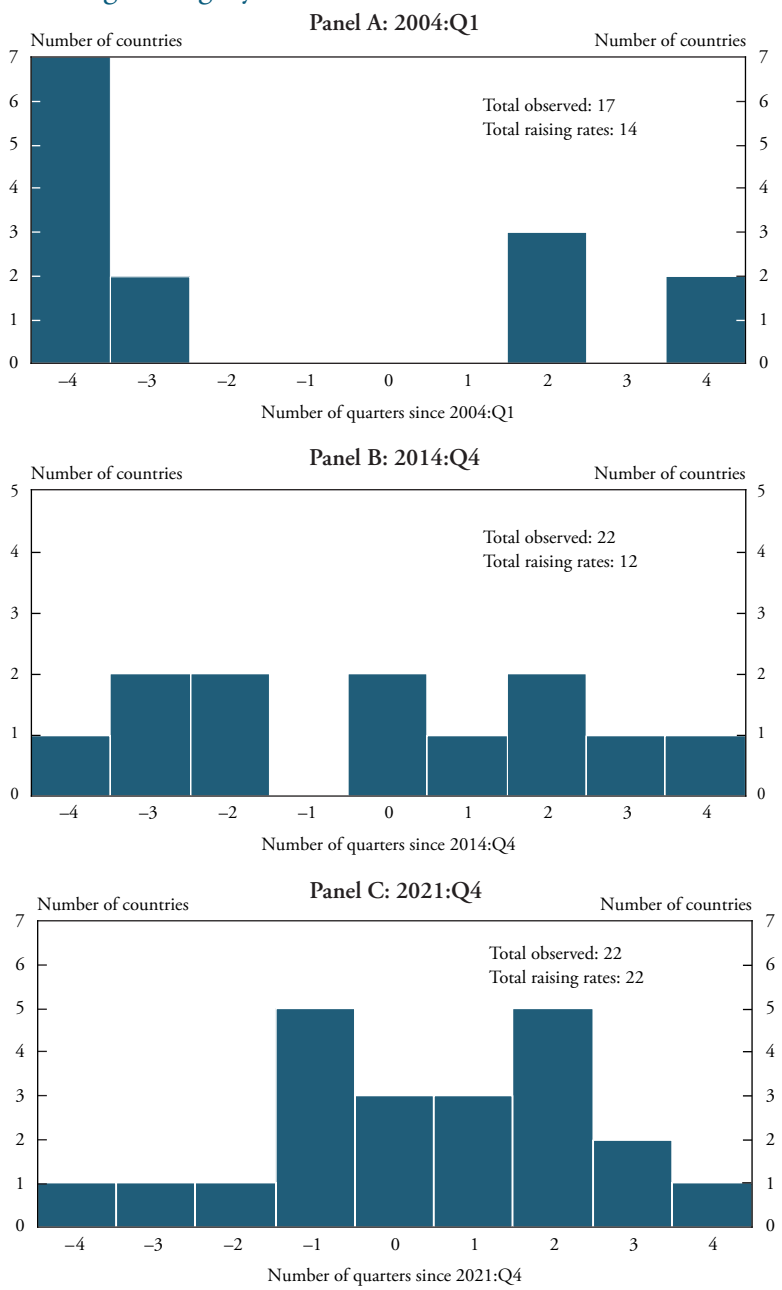
Chart 3 shows the number of emerging markets that raised their policy rates around these three Fed tightening cycles. For each cycle, we consider a window spanning four quarters before and after the start of the Fed cycle.[4] During each window and quarter, we count the number of emerging markets that raised their policy rate for the first time in the event window by at least 50 basis points, which we represent by the height of the bars in the chart. We chose a 50 basis point threshold because emerging markets tend to have higher policy rates and therefore adjust interest rates in larger increments. Overall, rate hikes further away from the start of tightening cycle are less likely to be in response to U.S. interest rates.

Although many central banks raised their policy rate during all three of the U.S. tightening cycles, the timing of these rate hikes differed, with synchronization most evident around the start of the 2021–23 cycle. Around the start of the 2004–06 cycle, 14 out of 17 emerging markets raised their policy rate (for this cycle, our sample includes only 17 emerging markets due to limited data). Because most of these initial rate hikes are not well aligned with the start of the U.S. tightening cycle, these rate hikes are less likely to be a direct response to U.S. policy tightening. Around the start of the 2014–19 cycle, only 12 out of 22 emerging markets raised their policy rates; however, rate hikes were closer to the start of the Fed tightening cycle, suggesting these hikes may have been in response to U.S. policy tightening. Finally, near the start of the 2021–23 cycle, all 22 emerging markets in our sample raised their policy rates. About half of the countries started to raise their policy rates prior to the start of the Fed tightening cycle, while the other half started to raise rates in the four quarters after. In other words, rate hikes in emerging markets were more synchronized with the Fed's policy tightening around the start of the 2021–23 cycle than during the previous two cycles.

A synchronous rate hike in an emerging market does not necessarily indicate a response to U.S. monetary policy; to assess this possibility more directly, we explore the primary drivers behind emerging markets' rate hike decisions. In particular, we examine whether a rate hike in an emerging market coincided with rising inflation, a depreciation of the currency (that is, a decline in the exchange rate), capital outflows, or some combination of these factors. For a rate hike to be consistent with

Chart 3

Start of Tightening Cycles in Emerging Markets Relative to Start of U.S. Tightening Cycle



Notes: Each histogram counts the number of emerging markets that raised their policy rates for the first time around the last three Fed tightening cycles. The threshold for a rate hike is 50 basis points.
Sources: Board of Governors of the Federal Reserve System, emerging market central banks (Haver Analytics), and authors' calculations.

inflationary pressures, annual inflation—as measured by the Consumer Price Index (CPI)—must increase by at least one percentage point at the time of the rate hike relative to its value two quarters before. For a rate hike to be consistent with a depreciating exchange rate, the emerging market's currency must depreciate more than 5 percent over the most recent two quarters. Finally, for a rate hike to be consistent with capital outflows, nonresident debt growth must decline either during the quarter of the rate hike or the quarter before.

Table 1 shows that rate hikes in our emerging market sample can be related to domestic inflationary pressures but also to international factors such as currency depreciation and capital outflows, which are influenced by U.S. monetary policy. The importance of each of these factors varies with the tightening cycle. At the beginning of the 2004–06 tightening cycle, half of the central banks raised policy rates amid inflationary pressures, while international factors played a smaller role. At the beginning of the 2014–19 cycle, 12 out of 22 central banks raised their policy rates. The majority of these 12 banks responded to international factors: 73 percent responded to capital outflows, and 58 percent responded to a depreciating exchange rate, while only 17 percent responded to elevated inflationary pressures. All central banks in our sample raised their policy rate at the beginning of the 2021–23 cycle. Among these banks, 73 percent responded to inflationary pressures, 67 percent to capital outflows, and 32 percent to a depreciating exchange rate. Taken together, evidence from the last 20 years suggests that while most central banks seemed to raise rates in response to inflationary pressures, some also raised rates in response to U.S. rate hikes, particularly during the 2014–19 cycle. However, the extraordinary synchronization during the 2021–23 cycle visible in Panel C of Chart 3 appears to be driven by domestic inflation, which comoved across the globe, rather than a response to U.S. monetary policy.

The 2021–23 U.S. tightening cycle followed the onset of the global COVID-19 pandemic in 2020. The pandemic resulted in a unique combination of lockdowns that led to widespread supply chain issues and accommodative fiscal and monetary policy to stimulate demand. This supply and demand imbalance during the economic recovery contributed to rising inflation in both advanced and emerging economies.

Table 1
Factors Underlying Rate Hike Decisions in Emerging Markets

Factors		2004–06 cycle (percent)	2014–19 cycle (percent)	2021–23 cycle (percent)
Domestic	Inflation	50	17	73
International	Depreciation	23	58	32
	Capital outflows	20	73	67

Notes: Each cell represents the share of countries that raised their policy rates in line with rising inflation, currency depreciation, or capital outflows during each of the last three Fed tightening cycles. A rate hike can be consistent with multiple factors; therefore, each column does not sum up to 100.
Sources: International Monetary Fund (Haver Analytics); Bloomberg; Ha, Kose, and Ohnsorge (2021); and authors' calculations.

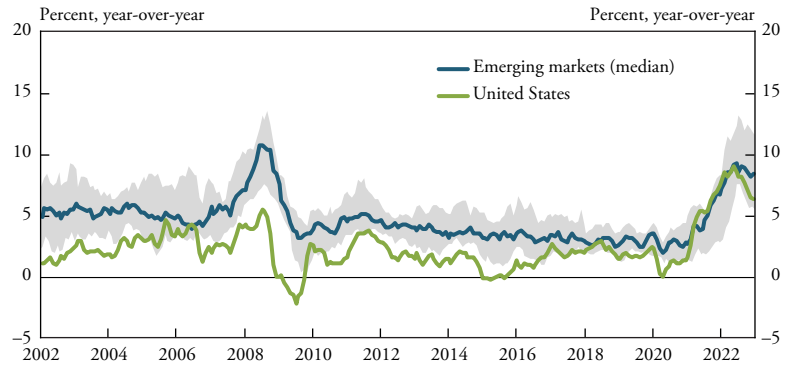
Because central banks have a mandate to stabilize prices, the global inflation cycle reversed the course of monetary policy and resulted in synchronous interest rate hikes among advanced and emerging markets.

Chart 4 shows that inflation was closely aligned across emerging markets and the United States during 2021 and most of 2022. The chart displays median annualized CPI inflation across emerging markets in blue along with 25th–75th percentile bands in gray. The green line represents U.S. CPI inflation. The blue and green lines are almost indistinguishable during the inflation surge in 2021 and the first half of 2022, when inflation across emerging markets and the United States accelerated in lockstep. This similarity across markets contrasts with previous years, when inflation rates for the most part differed both across emerging markets and relative to the United States. Toward the end of 2022, however, inflation rates once again started to diverge.

Although central banks' responses to inflation differ based on their inflation targets, the post-COVID-19 surge in inflation caused a broad and sustained increase in policy rates around the world. Chart 5 shows the median policy rate across emerging markets (blue line) along with 25th–75th percentile bands alongside the federal funds rate for the United States (green line), with each country-specific series demeaned to account for level differences. Policy rates in the United States and emerging markets clearly comoved during the global inflation cycle at a level unprecedented over the last 20 years, as central banks around the world responded to elevated inflation.

Chart 4

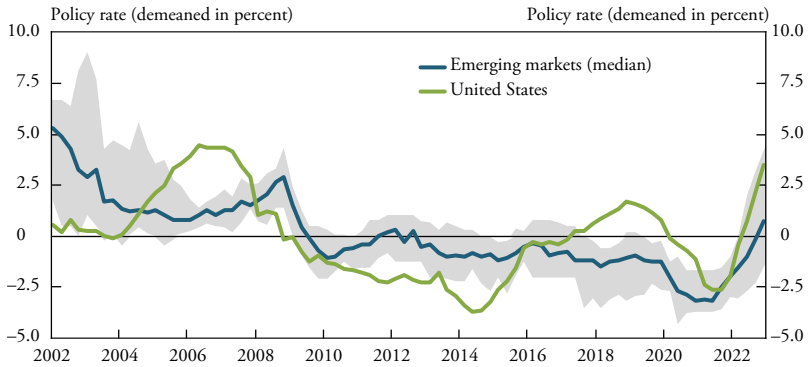
CPI Inflation in Emerging Markets and the United States Surged in 2021–22



Note: Shaded areas highlight the 25th–75th percentile range in inflation across emerging markets.
Sources: U.S. Bureau of Labor Statistics; Ha, Kose, and Ohnsorge (2021); and authors' calculations.

Chart 5

Policy Rates in Emerging Markets and the United States Comoved in 2022



Notes: Policy rates for each country are demeaned to account for level differences. The federal funds rate is replaced with the shadow rate for periods in which the policy rate was constrained by the zero lower bound. Shaded areas highlight the 25th–75th percentile range in policy rates across emerging markets.
Sources: Board of Governors of the Federal Reserve System, emerging market central banks (Haver Analytics), and authors' calculations.

Conclusion

Higher U.S. interest rates can reduce capital flows to emerging markets and depreciate their exchange rates, which may impair their macroeconomic growth. Foreign economic conditions in turn influence the United States through trade and financial linkages, so policymakers in the United States and emerging markets alike closely watch capital flows in response to U.S. monetary policy. One way for central banks in emerging markets to prevent capital outflows is to increase their policy rate in response to a higher federal funds rate, thereby incentivizing international investors to shift funds toward emerging markets. However, emerging markets may not always want to implement this strategy, as a higher policy rate tends to reduce domestic economic activity over time and could be out of sync with domestic price pressures.

We find that some emerging markets did respond to international spillovers by raising rates during the start of the 2014–19 U.S. tightening cycle. However, during the start of the 2004–06 and 2021–23 U.S. tightening cycles, emerging markets raised their policy rates primarily in response to domestic inflationary pressures.

Our analysis provides evidence that monetary policy in emerging markets differs from policy in advanced economies. Central banks in larger advanced economies tend to focus on inflation or employment and less on capital flows. In emerging markets, however, central banks also respond to changes in capital flows and the exchange rate, as these have a disproportionately larger effect on the emerging market economy if unaddressed.

Endnotes

[1]Our sample comprises Bolivia, Brazil, Bulgaria, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, Georgia, Guatemala, Hungary, Indonesia, Kazakhstan, Mexico, Nicaragua, Nigeria, Peru, Poland, Qatar, Saudi Arabia, South Africa, and Uganda.

[2]We replace the federal funds rate with the shadow rate at the zero lower bound (ZLB). The shadow rate measures the effective nominal interest rate when the federal funds rate is constrained by its effective lower bound. The shadow rate accounts for quantitative easing and is therefore generally negative at the ZLB.

[3]Foreign debt flows are based on the percent change in the International Investment Position (IIP) of nonresidents reported by the IMF. We look at portfolio debt and credit flows lumped into the "other" category. These positions are based on market values and therefore include price and quantity effects.

[4]The window helps us avoid misclassifying a rate hike in an emerging market as coinciding with the start of a U.S. tightening cycle when the central bank in fact started to raise interest rates earlier.

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