DISCUSSION PAPER

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ABSTRACT

This paper examines the potential impact of US monetary policy normalization on portfolio capital flows to Emerging Markets Economies (EME) explicitly taking into account the unconventional US monetary policy. We build an econometric model of the drivers of capital flows to EMEs and the results suggest that Brazil maybe less vulnerable than EMEs to changes in US monetary policy.

Keywords: capital flows; emerging market economies; unconventional US; monetary policy.

SINOPSE

Este texto examina o impacto potencial da normalização da política monetária dos Estados Unidos sobre os fluxos de capital em carteira direcionados para as economias de mercados emergentes (EMEs), levando em conta explicitamente a política monetária não convencional dos Estados Unidos. Construímos um modelo econométrico dos fatores que movem os fluxos de capital para as EMEs, e os resultados sugerem que o Brasil talvez seja menos vulnerável que as EMEs a mudanças na política monetária dos Estados Unidos.

Palavras-chave: economias de mercados emergentes; fluxos de capitais; política monetária americana não convencional.

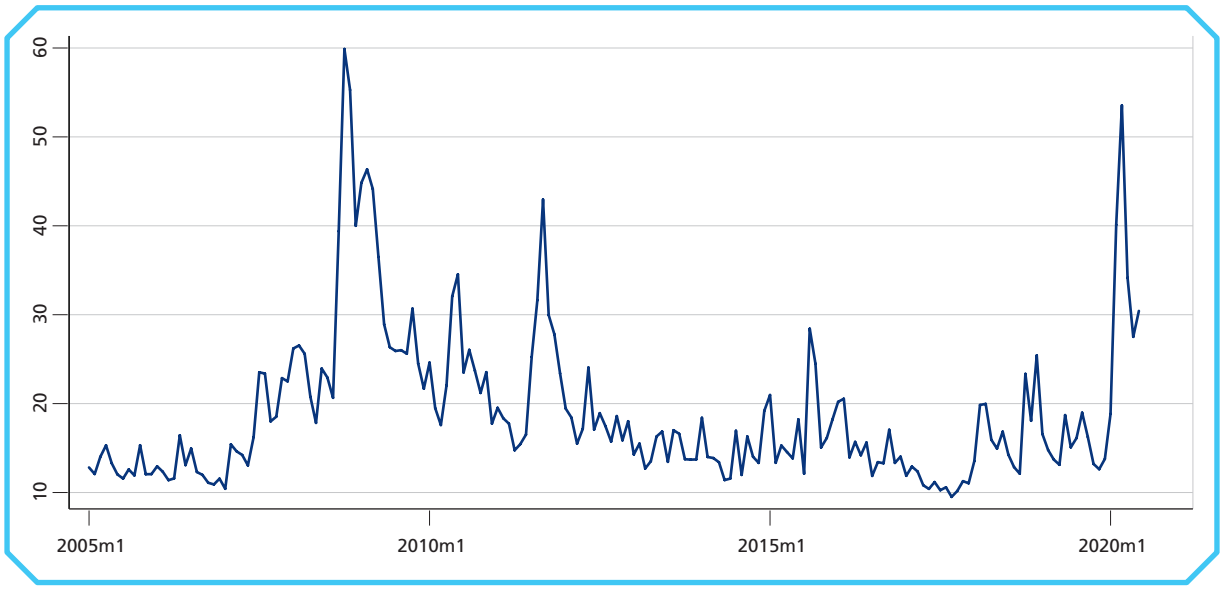
1 INTRODUCTION

Fluctuations in global financial markets have historically significantly influenced financial and macroeconomic conditions in EMEs. Under buoyant global financial conditions, emerging markets have enjoyed stronger economic growth supported by abundant foreign capital inflows. Conversely, when global financial conditions tightened – most notably during the global financial crisis – economic activity in emerging markets was severely affected.

Foreign portfolio flows are an important source of funding for EMEs. Nonresident portfolio investment can help expand and diversify the investor base for emerging market assets, lower the cost of funding, and contribute to stronger economic growth. However, reliance on foreign financing can also entail risks. Heightened uncertainty in the global economy can lead to a significant tightening of global financial conditions and increased portfolio flow volatility. Moreover, the strong and persistent portfolio inflows seen in earlier periods can create vulnerabilities by encouraging excessive domestic credit creation and an overvaluation of local currency and other financial assets.

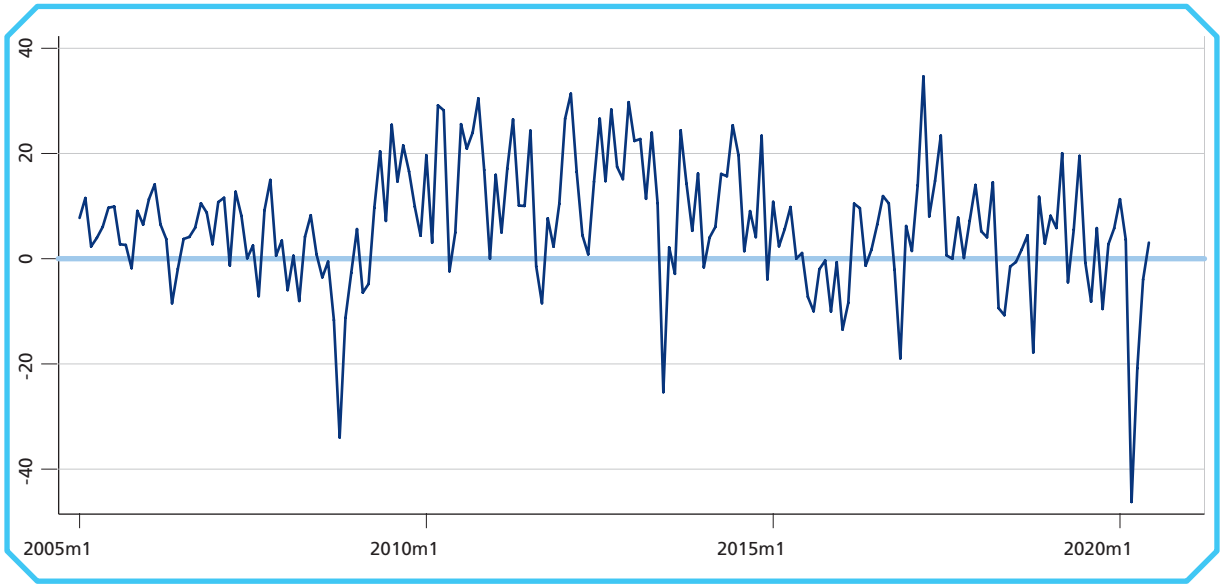
At the end of February 2020, news of the global spread of covid-19 hit financial markets with devastating force. One month later, global risk aversion had reached an intensity not observed since the peak of the global financial crisis (figure 1), while capital flows began to cascade out of EMEs (figure 2).

FIGURE 1
VIX index



Authors' elaboration.

FIGURE 2
Portfolio capital flows to EMEs
(In US$ 1 billion)



Authors' elaboration.

Since the announcement of several successful covid-19 vaccine trials in late 2020, the global economic outlook has improved. Given a more backloaded access to vaccinations and less policy space to provide lifelines and support economic activity, many EMEs are projected to have a more protracted recovery than major advanced economies.

During economic recovery, many emerging markets might struggle to provide sizable fiscal policy support for a prolonged period, given their more constrained policy space – and even more so following last year's sharp increase in public debt. Constrained fiscal policy, in turn, would heighten the role of monetary policy. This prompts the question of how much autonomy policymakers in emerging markets would have in keeping monetary policy rates low at a time when improved economic conditions may lead central banks in advanced economies to begin increasing interest rates. On this point, a commonly held view is that, even with a flexible exchange rate, emerging markets have little monetary policy autonomy against a powerful global financial cycle that is strongly influenced by monetary policy in advanced economies.

Going forward, the pressing question for emerging-market policy-makers is how capital flows will respond to the Fed's withdrawal of monetary stimulus and eventual increase in interest rates. To shed some light on this issue, this paper examines the potential impact of US monetary policy normalization on portfolio capital flows to EMEs explicitly taking into account the unconventional US monetary policy.

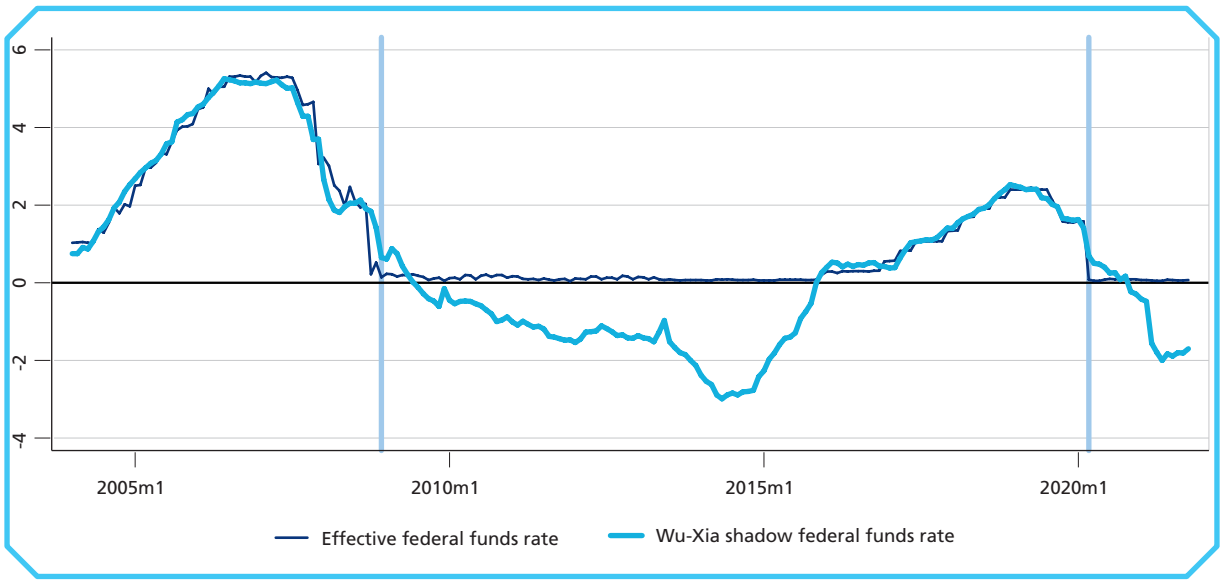
Our paper builds on two main strands of the literature. First, it builds on the extant literature on the determinants of capital flows to EMEs that focuses on the role of both country-specific or "pull" factors and global or "push" factors. Our aim, however, is not to revisit the debate on the determinants of capital flows in general, but to focus on the impact of U.S. monetary policy on portfolio flows to EMEs.

Second, it builds also on a second recent area of research that focuses on the spillovers to EMEs from advanced economies' monetary policies, with a particular focus on unconventional policy.

Our paper contributes to these two strands of the literature on the role of U.S. monetary policy in driving capital flows by using the fed funds shadow rate as a measure of monetary policy stance instead of the fed fund rate itself, as most of this literature. In response to the Great Recession and the covid-19 crisis, the Federal Reserve, like many other central banks, cut its policy interest rate close to zero. When this happens, the lower bound constraint on nominal interest rates makes it difficult to determine the stance of monetary policy given prevailing economic conditions from the observed policy rate alone. In an influential paper, Wu and Xia (2016) use a term structure model to construct a 'shadow' policy rate intended to quantify the interest-rate-equivalent stance of policy at the zero lower bound (ZLB). The basic idea is that we might use the shadow rate series as a way of summarizing what the Fed has been doing with its unconventional policy measures such as large-scale asset purchases and forward guidance. If the Wu-Xia framework is correct, these unconventional policies can all be summarized in terms of what effect they had on the shadow short rate. Figure 3 pictures the difference between the Wu-Xia shadow rate and the federal funds rate.[1]

1. The vertical lines at December 2008 and March 2020 indicate months where the Federal Open Market Committee lowered the target range for the federal funds rate to the interval between 0 and 1/4 percent.

FIGURE 3
Wu-Xia shadow federal funds rate
(In % p.a.)



Authors' elaboration.
Obs.: p.a. – per annum.

We build an econometric model of the drivers of capital flows to EMEs and using sample data from January 2010 to December 2019 we find that the coefficient of the U.S. monetary policy stance has the expected negative sign and is highly statistically significant for both Brazil and EMEs*. The coefficient for EMEs* being four time as big as that for Brazil, suggests that Brazil maybe less vulnerable than EMEs* to changes in US monetary policy.

The remainder of the paper is organized as follows. Section 2 presents an overview of the US monetary policy after the 2007-2008 financial crisis. Section 3 outlines the empirical model. Section 4 provides a description of the data used. Section 5 reports the estimation results. Section 6 tests the robustness of the results. Finally, section 7 brings the concluding remarks.

2 AN OVERVIEW OF THE U.S. MONETARY POLICY AFTER THE 2007-2008 FINANCIAL CRISIS

In November 2008, the Federal Reserve faced a deteriorating economy and a financial crisis. The federal funds rate had already been reduced to virtually zero. Thus, the Federal Reserve turned to unconventional monetary policies. During the period from late 2008 through late 2014, the Federal Reserve provided further monetary policy easing by authorizing three rounds of large-scale asset purchase programs – often referred to as quantitative easing – and a maturity extension

program, which lengthened the maturity profile of the Fed's holdings of Treasury securities. The Federal Reserve purchased longer-term securities, with the goal of putting downward pressure on longer-term interest rates, supporting mortgage markets, and making broader financial market conditions more accommodative. The longer-term securities purchased during these programs included: US Treasury securities; mortgage-backed securities backed by Fannie Mae, Freddie Mac, and Ginnie Mae (agency MBS); and direct obligations of housing-related government sponsored enterprises (GSEs) Fannie Mae, Freddie Mac, and the Federal Home Loan Banks (agency debt). Figures 3 and 4 show how the U.S. unconventional monetary policy unfolded in terms of the Federal Reserve assets holdings.

In addition, from 2010 through September 2017, the Federal Reserve reinvested principal payments received on securities held in the System Open Market Account, keeping holdings of longer-term securities at sizable levels, which helped maintain accommodative financial conditions during and after the financial crisis.

2.1 First round of large-scale asset purchases (2008-2010)

From November 2008 to March 2010, the first round of large-scale asset purchases included purchases of US$ 175 billion in agency debt, US$ 1.25 trillion in agency MBS, and US$ 300 billion in longer-term treasury securities. Following completion of the program, the Federal Reserve rolled over maturing Treasury securities (consistent with historical practice) and, starting in August 2010, maintained the then-current total level of securities by also reinvesting principal payments from agency debt and agency MBS (initially, in longer-term treasury securities).

2.2 Second round of large-scale asset purchases (2010-2011)

From November 2010 to June 2011, the second round of large-scale asset purchases included US$ 600 billion in longer-term treasury securities. Principal payments received from holdings of all domestic securities continue to be reinvested in treasury securities.

2.3 Maturity Extension Program (2011-2012)

From September 2011 through 2012, the Maturity Extension Program, commonly known as Operation Twist, included purchases of US$ 667 billion in treasury securities with remaining maturities of 6 years to 30 years, offset by sales of US$ 634 billion in treasury securities with

remaining maturities of 3 years or less and US$ 33 billion of Treasury security redemptions. It also included reinvesting principal payments from agency debt and agency MBS in agency MBS.

At the commencement of the Maturity Extension Program, the Federal Reserve also shifted its reinvestment policy to reinvestment principal payments from holdings of agency debt and agency MBS in agency MBS rather than treasury securities.

2.4 Third round of large-scale asset purchases (2012-2014)

From September 2012 through 2013, the third round of large-scale asset purchases included monthly purchases of US$ 40 billion in agency MBS, dropping to monthly purchases of US$ 35 billion in January 2014 and decreasing by US$ 5 billion until October 2014. Starting in January 2013, it also included monthly purchases of US$ 45 billion in longer-term Treasury securities, dropping to monthly purchases of US$ 40 billion in January 2014 and decreasing by US$ 5 billion until October 2014. In total, the Federal Reserve purchased US$ 790 billion in Treasury securities and US$ 823 billion in agency MBS in the third purchase program.

The Federal Reserve resumed Treasury rollovers at the start of the third large-scale asset purchase program, and maintained its existing Treasury and agency debt and agency MBS reinvestment practices throughout and following the conclusion of the program.

2.5 Balance sheet normalization

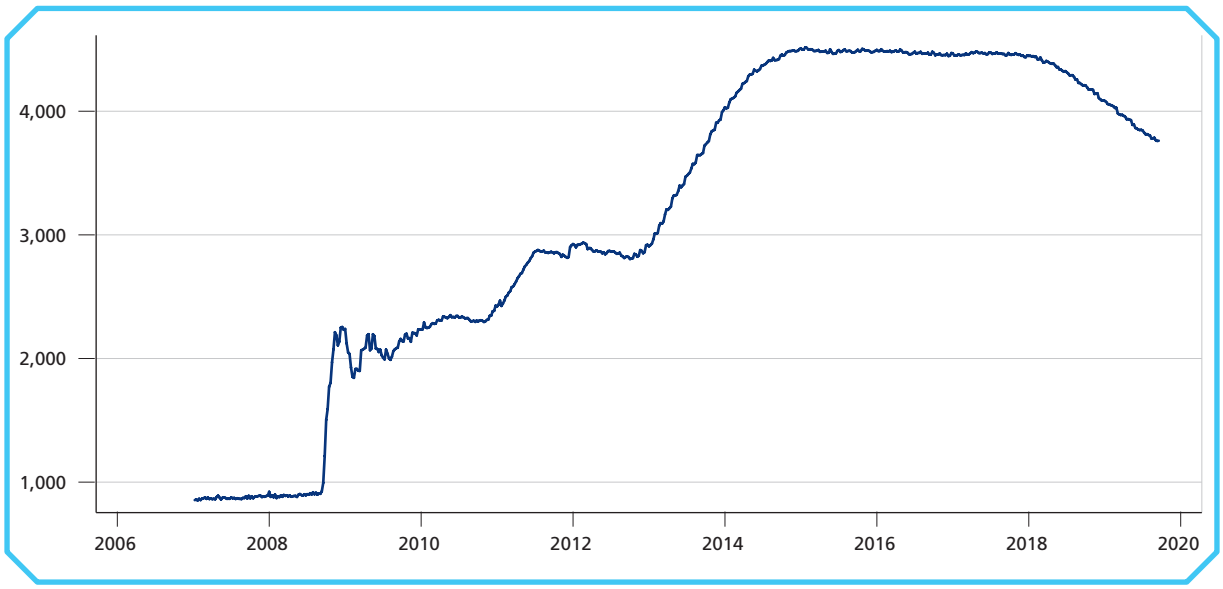
Starting in October 2017, the Federal Reserve began to reduce its securities holdings to normalize the size of its balance sheet by decreasing reinvestments of principal payments from the Federal Reserve's securities holdings.[2]

2. In response to the economic impact of the covid-19 pandemic, the Federal Reserve cut short-term interest rates to zero on March 15, 2020 and restarted its large-scale asset purchases. From June 2020 to October 2021, the Fed bought US$ 80 billion of Treasury securities and US$ 40 billion of agency mortgage-backed securities (MBS) each month. As the economy rebounded in late 2021, Fed officials began slowing – or tapering – the pace of its bond purchases.

FIGURE 4

Total assets of the federal reserve (2007-2020)

(In US$ 1 billion)

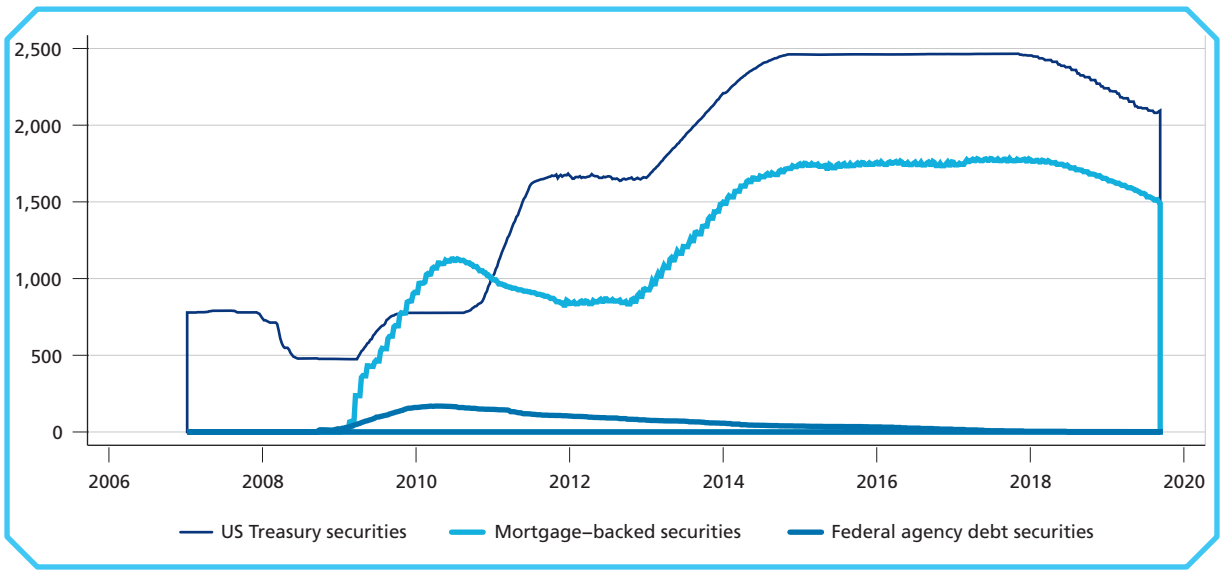


Authors' elaboration.

FIGURE 5

Selected federal reserve domestic securities holdings

(In US$ 1 billion)



Authors' elaboration.

3 BASELINE EMPIRICAL MODEL

To quantify the impact of U.S. monetary policy on capital flows to EMEs, we take on board the insights of the literature on the drivers of capital flows to EMEs and adopt a specification closely resembling those found in Ahmed and Zlate (2014), Clark et al. (2019), and Koepke (2018), among others. We model capital flows as a function of U.S. monetary policy, return differentials, investor perception of country riskiness, and global risk aversion.[3]

$$Flows_{j,t} = \beta_0 + \beta_1 USMonPol_t + \beta_2 RD_{j,t} + \beta_3 CR_{j,t} + \beta_4 GRA_t + \beta_5 Flows_{j,t} + \varepsilon_{j,t} \quad ,$$

where β_0 is the intercept term; $Flows_{j,t}$ are net portfolio flows by non-residents to country *j* in month *t*, measured as a share of the country's GDP; $USMonPol_t$ is an indicator of U.S. monetary policy stance; $RD_{j,t}$ is the return differencial between country *j* and the U.S.; $CR_{j,t}$ is investor perception of country *j* riskiness, GRA_t is a measure of global risk aversion; $\varepsilon_{j,t}$ is a stochastic error term.[4]

4 DATA

Our sample data is monthly and goes from January 2010 to December 2019. To measure portfolio capital flows we use Koepke and Paetzold (2020) [KP] dataset, scaled by each country's nominal GDP (in US dollar terms). Portfolio flows arise through the transfer of ownership of securities from one country to another. The securities involved in these transactions can be either stocks ("portfolio equity flows") or bonds ("portfolio debt flows").[5] The transactions are recorded in the balance of payments (BoP) of the two countries involved. The challenge with BoP data is that monthly figures are only available for a limited number of countries and that the data are typically released with a delay of several months. KP address this gap by providing a monthly portfolio flow

3. We also include in our specification a lagged dependent variable, reflecting the persistence or momentum of cross-border capital flows documented in previous research.

4. We have used a policy differential with the United States only, rather than with the Advanced Economies (AE) aggregate, because most discussions of the impact of AE policies on EME capital flows focus primarily on US policies, and US interest rates are also used generally as a proxy for global interest rates in the empirical work. However, in practice, it makes little difference if the US policy rate is substituted by an aggregate AE policy rate. This suggests that the relationship between the US policy rate and capital flows to EMEs is capturing not just the effect of US monetary policies, but of AE monetary policies more broadly.

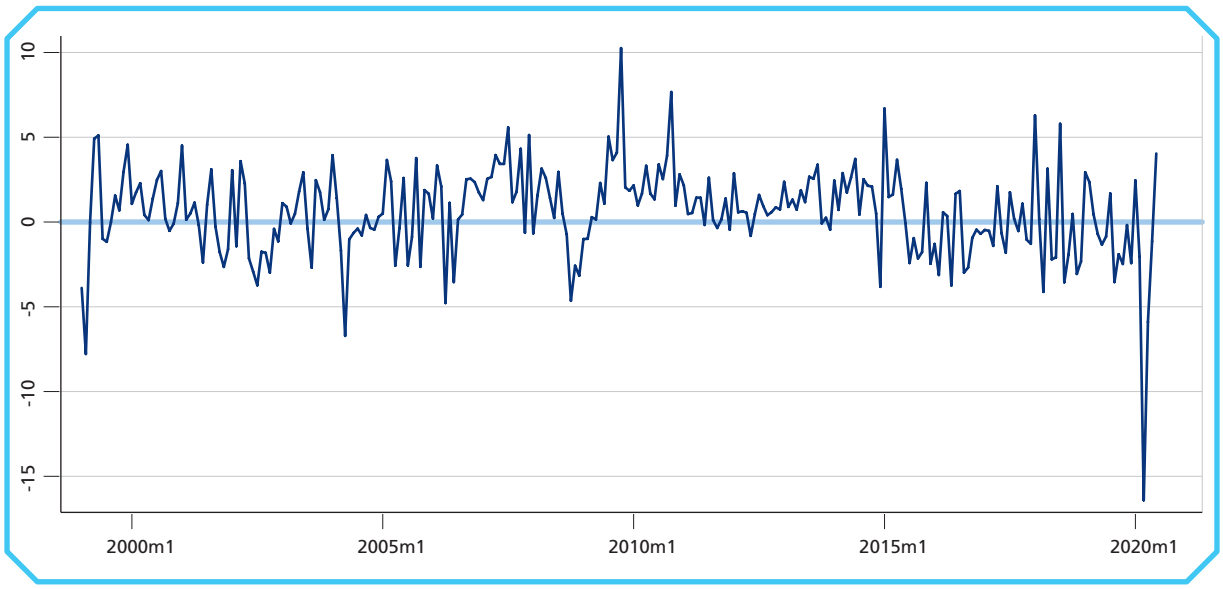
5. Flows of foreign direct investment (FDI) are not included in our analysis of capital flows because the determinants of FDI are quite different from portfolio flows.

dataset designed specifically for academic use.[6] The dataset covers 19 of the largest emerging market economies and tracks the quarterly balance of payments data of these countries closely.[7] Figure 6 (7) shows the behavior of portfolio flows to Brazil (EMEs*) during the last 20 years. Figure 8 (9) exhibits the behavior of the components of portfolio flows to Brazil (EMEs*).

FIGURE 6

Portfolio flows over GDP to Brazil

(In % of GDP)



Authors' elaboration.

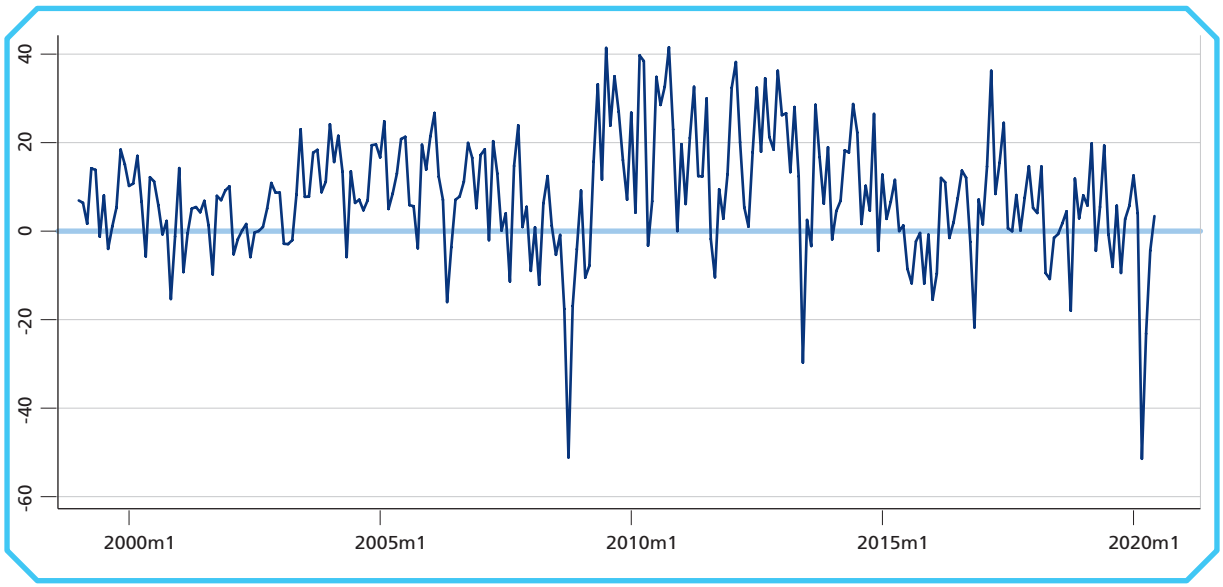
6. The dataset is similar to the monthly data on country-level portfolio flows compiled by the Institute for International Finance (IIF), but has the advantage that it is available online for free (whereas IIF data are not accessible to most academics because they are restricted to members, which are mostly financial institutions).

7. The countries included are the Brazil, Bulgaria, Chile, China, Czech Republic, Hungary, India, Lebanon, Mexico, Pakistan, Philippines, Poland, Romania, South Africa, Korea, Sri Lanka, Thailand, Turkey, Ukraine. Of these countries, the Czech Republic and Korea are not part of the IMF's classification of emerging markets, but are included in private sector classifications of EMs such as leading investment benchmark indices. We denote by EMEs* this group of countries that does not include Brazil.

FIGURE 7

Portfolio flows over GDP to EMEs*

(In % of GDP)

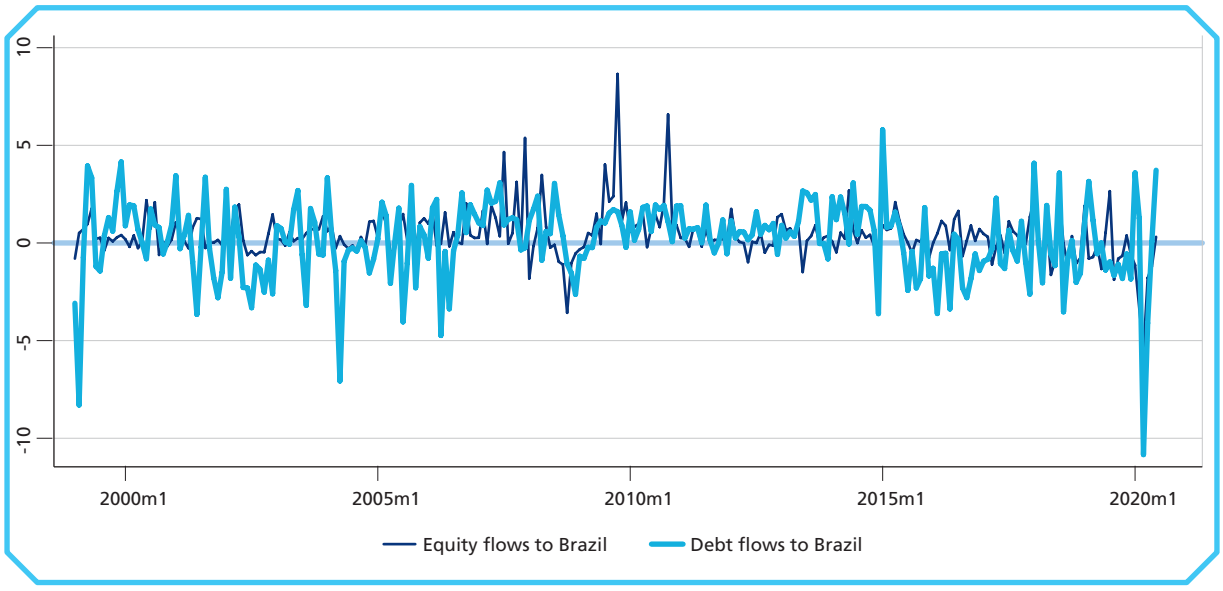


Authors' elaboration.

FIGURE 8

Equity and debt flows over GDP to Brazil

(In % of GDP)

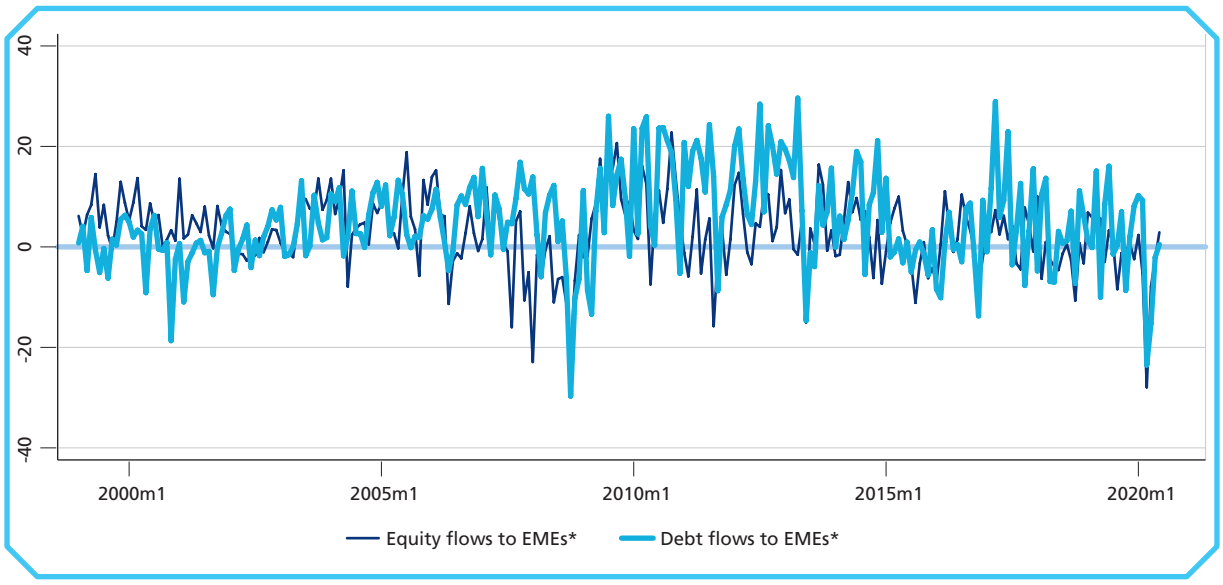


Authors' elaboration.

FIGURE 9

Equity and debt flows over GDP to EMEs*

(In % of GDP)



Authors' elaboration.

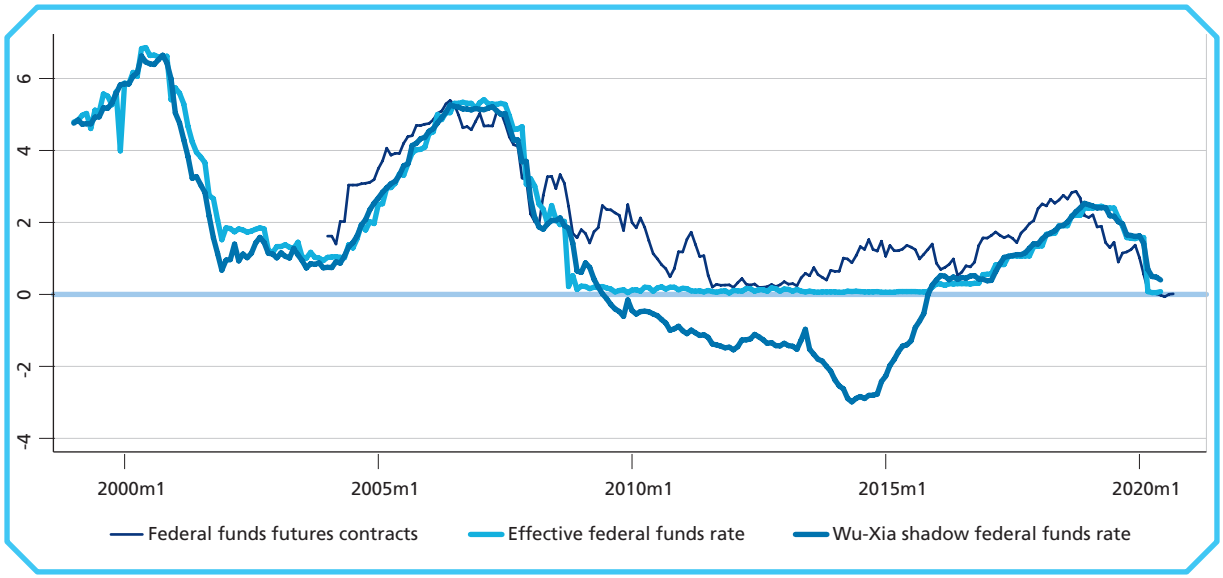
If the central bank is at its effective lower bound but is making announcements about the future path of the policy rate (forward guidance), expanding its balance sheet, and altering its asset holdings, it can be difficult to develop a summary measure of monetary policy. We measure monetary conditions with two different variables. First, we use Wu and Xia (2016) federal funds shadow rate that estimates an effective short-term rate when the policy rate is fixed at zero. They used a theory of the relationship between interest rates on government bonds of different maturities to estimate the value of the short-term rate that is consistent with the observed behavior of long-term rates. When the actual short-term rate is positive, their estimate corresponds to the actual short-term rate. When the actual short-term rate is fixed at its lower bound, they obtain an estimated shadow short-term rate. If nonstandard policies are effective at reducing long-term interest rates, even though the actual policy rate has not changed, the shadow rate will be below the policy rate. Its level can proxy for the impact of the nonstandard policies.

Second, we follow Koepke (2018) in taking into account the forward-looking nature of interest rate markets and monetary policy by focusing on the unanticipated component of changes in interest rates. The federal fund futures contracts are used to measure the extent to which future changes in policy interest rates are priced in by financial markets.[8] Changes in the future inter-

8. We use the 1-month change in the expected federal funds rate 24 months later.

est rates implied by federal funds futures contracts indicate a revised path for monetary policy, capturing the unanticipated component of changes in interest rates. The main hypothesis is that changes in Fed policy rate expectations drive international portfolio flows movements, with shifts in market expectations towards easier future monetary policy resulting in a boost to portfolio flows to emerging markets, and vice versa. Figure 10 shows the federal funds rate, the Wu-Xia shadow rate, and the rate implicit in the federal funds futures (24 months-ahead) contracts.

FIGURE 10
US monetary policy indicators
(In % p.a.)

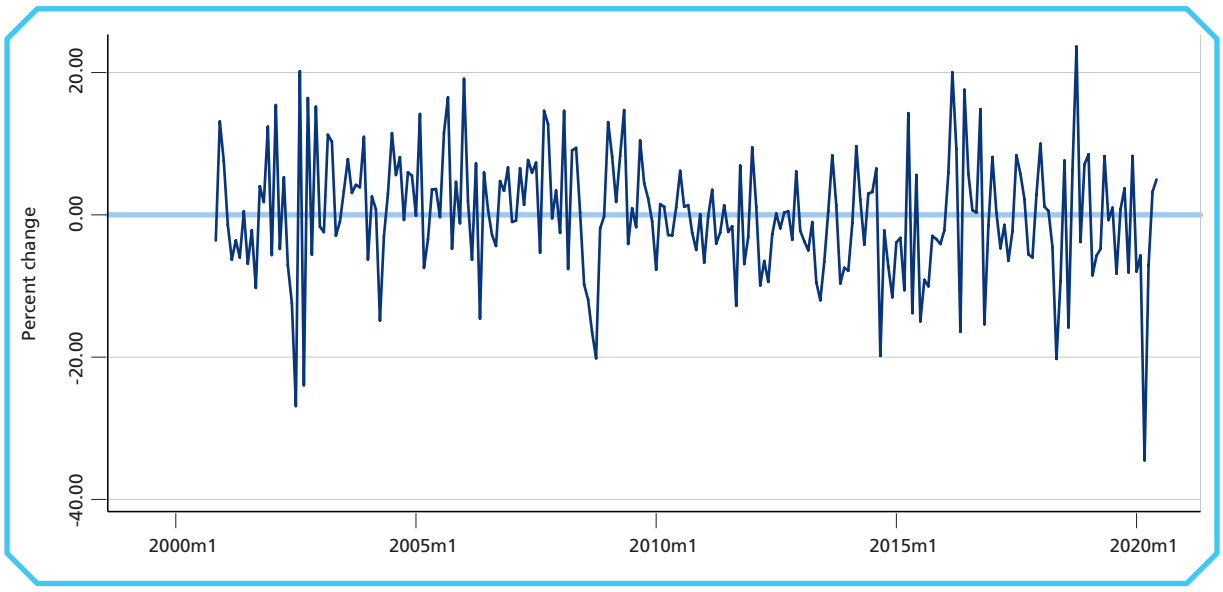


Authors' elaboration.

We use an aggregate market stock market index, the Morgan Stanley Capital International (MSCI) index, to capture the return differential between Brazil (EMEs) and the U.S. (figure 11 [12]).

FIGURE 11

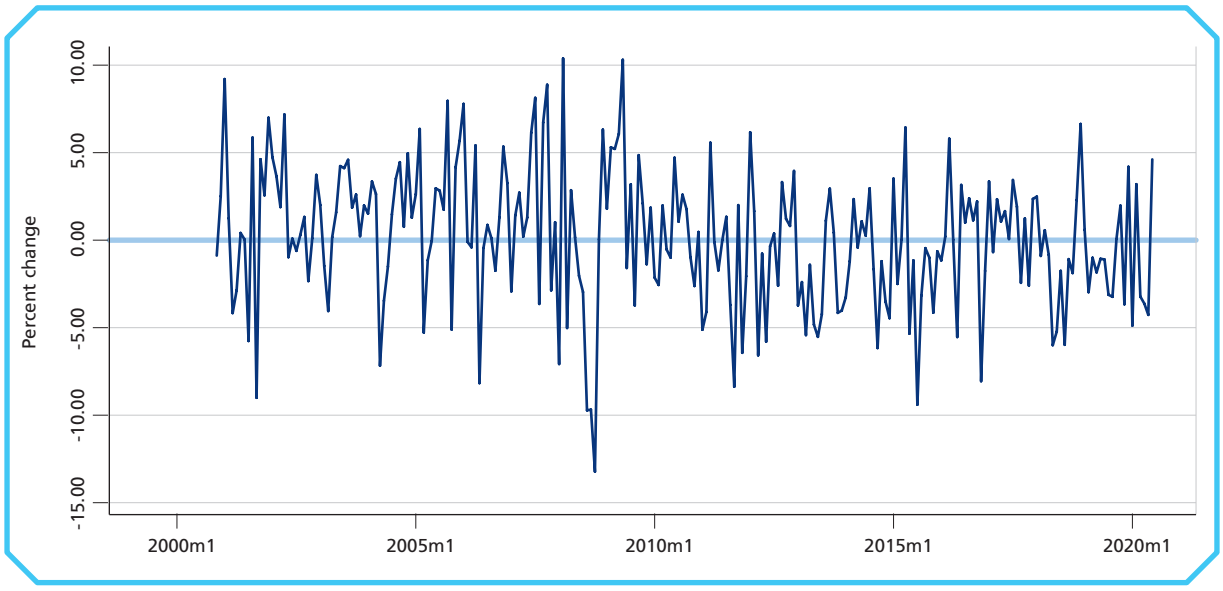
MSCI return differential between Brazil and US



Authors' elaboration.

FIGURE 12

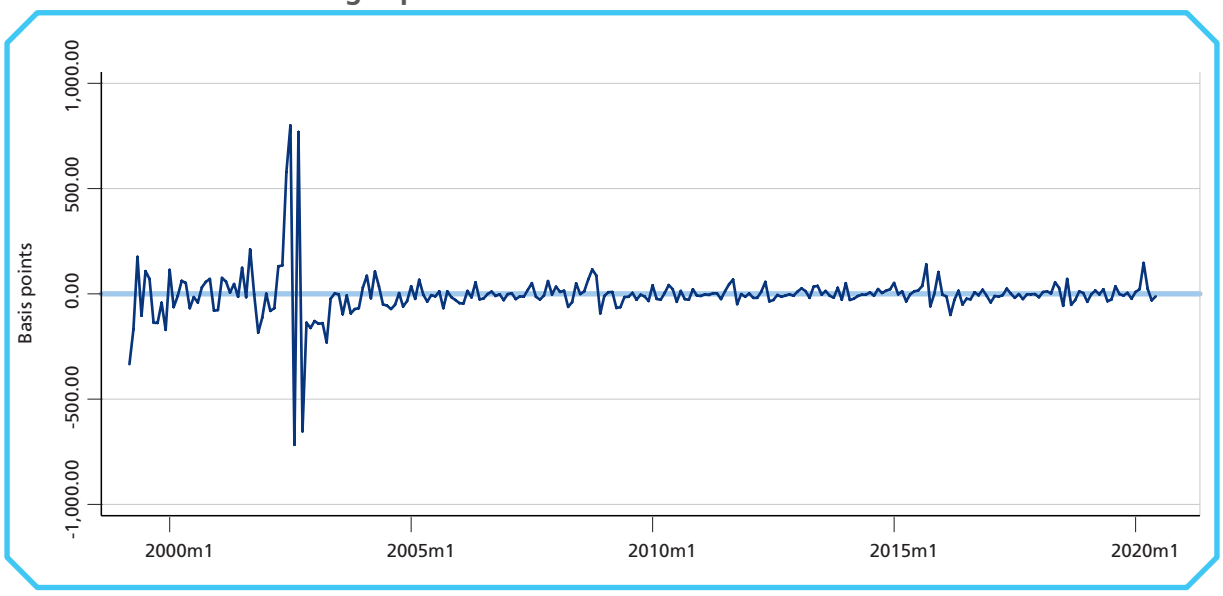
MSCI return differential between EMEs and US



Authors' elaboration.

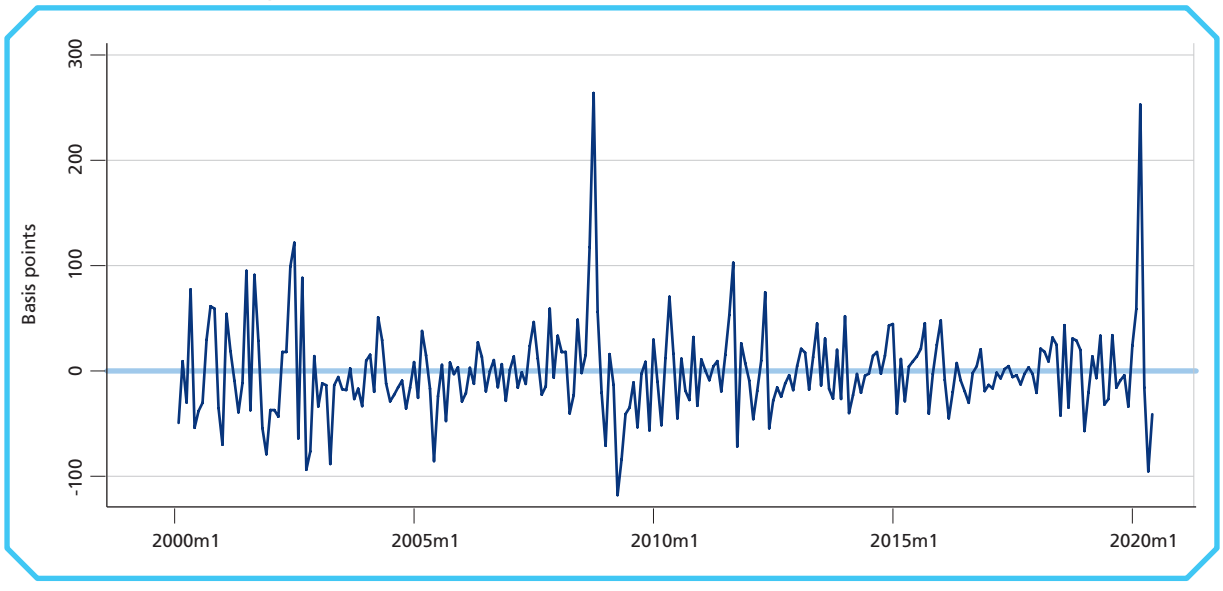
To capture investor perceptions of country risk, we use the country-specific Emerging Market Bond Index Global (EMBIG) spread for each country. Figure 13 pictures the EMBIG spread for Brazil and figure 14 the EMBIG itself.

FIGURE 13
Brazil EMBIG sovereign spread



Authors' elaboration.

FIGURE 14
EMBIG sovereign spread



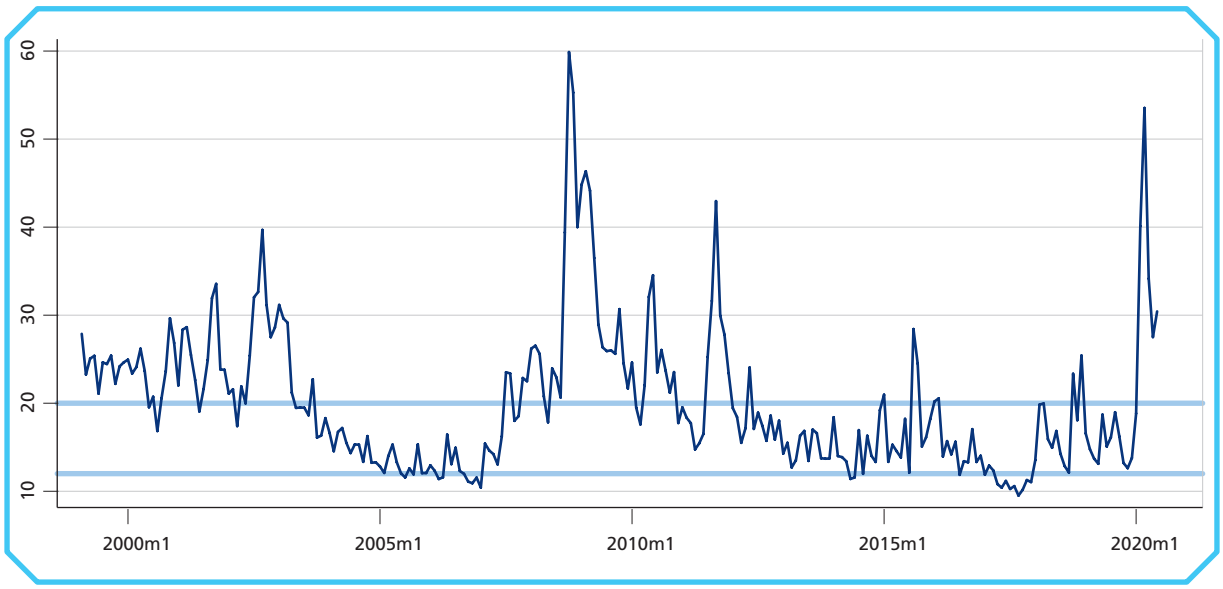
Authors' elaboration.

As an indicator of global risk aversion, we use the change in the Chicago Board Options Exchange (CBOE) Market Volatility Index (VIX).[9] The VIX is implied by the current prices of S&P 500

9. Specifically, we use the end of the month close.

index options and represents expected future market volatility over the next 30 calendar days.[10] Even simple interpretations of VIX can offer predictive informational content regarding future volatility. One such example takes a VIX level below 12 to be "low", a level above 20 to be "high", and a level in between to be "normal" (figure 15).

FIGURE 15
VIX Index

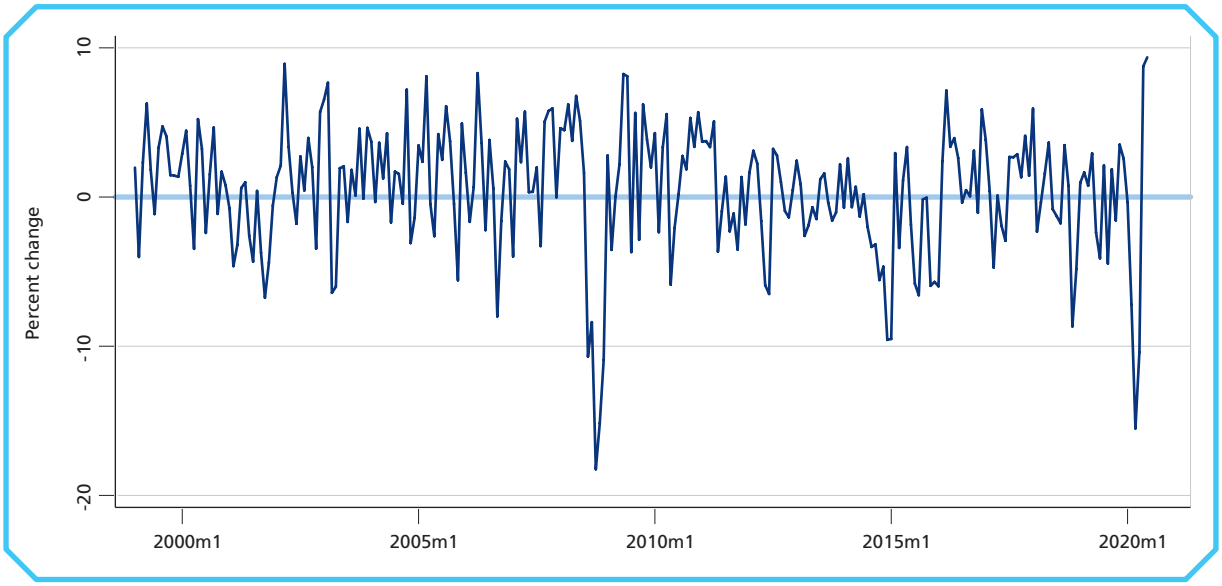


Authors' elaboration.

When testing the robustness of the baseline model we include the commodity price index constructed by the IMF (figure 16).

10. The S&P 500 is a stock market index tracking the performance of 500 of the largest US publicly traded companies, weighted by market capitalisation. The S&P 500 is considered to be a good representation of the US economy, due to its large volume and diversity of components. Despite comprising of 500 companies, the 10 largest companies in the index account for over a quarter of its total market capitalisation alone, including tech giants Apple, Amazon and Microsoft.

FIGURE 16
Change in commodity prices



Authors' elaboration.

5 RESULTS OF THE BASELINE MODEL

The baseline regression results are reported in table 1 (Brazil) and table 2 (EMEs*), which show estimations using the Wu-Xia shadow rate as a measure of U.S. monetary policy stance. The coefficient of the measure of U.S. monetary policy stance has the expected negative sign and is highly statistically significant for both Brazil and EMEs*, with the coefficient for EMEs* being four time as big as that for Brazil, suggesting that Brazil maybe less sensitive than EMEs* to changes in U.S. monetary policy.

We find that both Brazil and EMEs* return differentials vis-à-vis the advanced economies have an economically and statistically significant impact on net private capital flows.

The results suggest that increases in sovereign spreads, a measure of perceived country risk, lead to lower capital flows for both Brazil and EMEs*, even though the coefficient for Brazil is not statistically significant.

In contrast to much of the literature on the drivers of capital flows, we find that swings in global risk appetite, as measured by changes in the VIX index, are not significantly related to capital flows. However, since the VIX index is derived from the US equity market, it is more closely correlated with portfolio equity flows than with debt flows. Therefore, the non-significance of

the VIX in the baseline estimates may be due to the fact that the dependent variable $Flow_{i,t}$ is composed by both debt and equity flows.[11]

TABLE 1

Baseline model estimates for Brazil with the Wu-Xia shadow rate as an indicator of US monetary policy stance

Dependent variable: $Flow_{BR,t}$ Estimation method: OLS Sample: 2010:M1--2019:M12 Observations: 120				
Variable	Coefficient	Standard error	P-value	95% confidence interval
WX_t	-0.542	0.140	0.000	[-0.820,-0.264]
$MSCI_{BR}$	0.057	0.028	0.044	[0.001,0.113]
$EMBIG_{BR}$	-0.010	0.008	0.254	[-0.027,0.007]
VIX_t	-0.009	0.041	0.827	[-0.091,0.073]
$Flow_{BR}$	0.085	0.119	0.475	[-0.150,0.321]
Constant	0.432	0.209	0.041	[0.017,0.848]
R-squared: 0.231				

Authors' elaboration.

TABLE 2

Baseline model estimates for EMEs* with the Wu-Xia shadow rate as an indicator of US monetary policy stance

Dependent variable: FlowEMEs*,t Estimation method: OLS Sample: 2010:M1--2019:M12 Observations:120				
Variable	Coefficient	Robust standard error	P-value	95% confidence interval
WX_t	-2.154	0.658	0.001	[-3.458,-0.850]
$MSCI_{EMEs,t}$	1.208	0.310	0.000	[0.594,1.823]
$EMBIG_t$	-0.136	0.051	0.009	[-0.238,-0.034]

(Continues)

11. In the next section, we test if one type of portfolio flow (debt or equity) is more affected than the other by changes in global risk aversion. We will see that when consider portfolio equity flows alone, the VIX coefficient has the "right" sign and turns out to be statiscally significant.

(Continued)

Dependent variable: FlowEMEs*,t Estimation method: OLS Sample: 2010:M1--2019:M12 Observations:120				
Variable	Coefficient	Robust standard error	P-value	95% confidence interval
VIX_t	0.006	0.340	0.984	[-0.668,0.681]
$Flow_{EMEs^*,t}$	0.313	0.071	0.000	[0.170,0.455]
Constant	7.007	1.176	0.000	[4.676,9.339]
R-squared: 0.399				

Authors' elaboration.

6 ROBUSTNESS

In this section we examine the extent to which our results hold when we use alternative specifications to the baseline model. First, we estimate the model where we use the future funds rate as an indicator of US monetary policy stance instead of the Wu-Xia shadow rate (tables 3 and 4). For Brazil the coefficient of the future funds rate is not significant. Second, we test if one type of portfolio flow (debt or equity) is more affected than the other by changes in global risk aversion (tables 5 and 8). Indeed, when we consider portfolio equity flows alone, the VIX coefficient has the "right" sign and turns out to be statiscally significant. Finally, we extend our baseline model by including commodity prices as a measure of the growth outlook for EMEs (tables 9 and 10). Notwithstanding the coefficient of the commodity prices being not significant, it doesn't change the baseline results about the effect of the US monetary policy stance on capital flows to Brazil/EMEs.

TABLE 3
Model estimates for Brazil with future funds rate as an indicator of US monetary policy stance

Dependent variable: FlowBR,t Estimation method: OLS Sample: 2010:M1--2019:M12 Observations: 120				
Variable	Coefficient	Robust standard error	P-value	95% confidence interval
FFR_t	-0.008	0.011	0.457	[-0.030,0.013]
$MSCI_{BR,t}$	0.043	0.030	0.166	[0.018,0.104]
$EMBIG_{BR,t}$	-0.013	0.009	0.170	[-0.031,0.005]

(Continues)

(Continued)

Dependent variable: FlowBR,t Estimation method: OLS Sample: 2010:M1--2019:M12 Observations: 120				
Variable	Coefficient	Robust standard error	P-value	95% confidence interval
VIX_t	-0.012	0.042	0.765	[-0.096,0.071]
$Flow_{BR,t}$	0.229	0.116	0.051	[-0.001,0.460]
Constant	0.490	0.228	0.034	[0.037,0.943]
R-squared: 0.109				

Authors' elaboration.

TABLE 4

Model estimates for EMEs* with future funds rate as an indicator of US monetary policy stance

Dependent variable: $Flow_{EMEs^*,t}$ Estimation method: OLS Sample: 2010:M1--2019:M12 Observations: 120				
Variable	Coefficient	Robust standard error	P-value	95% confidence interval
FFR_t	-0.125	0.059	0.037	[-0.243,-0.007]
$MSCI_{EMEs,t}$	0.805	0.372	0.033	[0.066,1.543]
$EMBIG_t$	-0.183	0.058	0.002	[-0.298,-0.068]
VIX_t	0.041	0.340	0.903	[-0.633,0.716]
$Flow_{EMEs^*,t-1}$	0.386	0.069	0.000	[0.248,0.524]
Constant	6.545	1.219	0.000	[4.131,8.960]
R-squared: 0.376				

Authors' elaboration.

TABLE 5

Baseline model estimates for Brazil with equity flows as the dependent variable

Dependent variable: $Equity_{BR,t}$ Estimation method: OLS Sample: 2010:M1--2019:M12 Observations: 120				
Variable	Coefficient	Robust standard error	P-value	95% confidence interval
WX_t	-0.149	0.058	0.012	[-0.265,-0.341]
$MSCI_{BR,t}$	0.032	0.011	0.006	[0.009,0.551]
$EMBIG_{BR,t}$	-0.005	0.004	0.191	[-0.0133,0.002]
VIX_t	-0.027	0.016	0.102	[-0.061,0.005]
$Equity_{BR,t-1}$	0.153	0.097	0.119	[-0.039,0.346]
Constant	0.288	0.081	0.001	[0.125,0.450]
R-squared: 0.206				

Authors' elaboration.

TABLE 6

Baseline model estimates for Brazil with debt flows as the dependent variable

Dependent variable: $Debt_{BR,t}$ Estimation method: OLS Sample: 2010:M1--2019:M12 Observations: 120				
Variable	Coefficient	Robust standard error	P-value	95% confidence interval
WX_t	-0.388	0.125	0.002	[-0.637,-0.139]
$MSCI_{BR,t}$	0.025	0.024	0.292	[-0.022,0.074]
$EMBIG_{BR,t}$	-0.004	0.007	0.548	[-0.020,0.010]
VIX_t	0.017	0.034	0.619	[-0.051,0.085]
$Debt_{BR,t-1}$	0.074	0.139	0.592	[-0.200,0.350]
Constant	0.123	0.154	0.426	[-0.183,0.430]
R-squared: 0.167				

Authors' elaboration.

TABLE 7

Baseline model estimates for EMEs* with equity flows as the dependent variable

Dependent variable: $Equity_{EMEs^*,t}$ Estimation method: OLS Sample: 2010:M1--2019:M12 Observations: 120				
Variable	Coefficient	Robust standard error	P-value	95% confidence interval
WX_t	-0.869	0.289	0.003	[-1.442,-0.296]
$MSCI_{EMEs,t}$	0.651	0.128	0.000	[0.396,0.906]
$EMBIG_t$	-0.057	0.022	0.013	[-0.102,-0.012]
VIX_t	-0.272	0.133	0.043	[-0.535,-0.008]
$Equity_{EMEs^*,t-1}$	0.248	0.089	0.007	[0.070,0.426]
Constant	1.975	0.472	0.000	[1.039,2.912]
R-squared: 0.436				

Authors' elaboration.

TABLE 8

Baseline model estimates for EMEs* with debt flows as the dependent variable

Dependent variable: $Debt_{EMEs^*,t}$ Estimation method: OLS Sample: 2010:M1--2019:M12 Observations: 120				
Variable	Coefficient	Robust standard error	P-value	95% confidence interval
WX_t	-1.508	0.551	0.007	[-2.601,-0.415]
$MSCI_{EMEs,t}$	0.570	0.266	0.034	[0.043,1.097]
$EMBIG_t$	-0.080	0.040	0.048	[-0.160,-0.000]
VIX_t	0.314	0.268	0.244	[-0.217,0.846]
$Debt_{EMEs^*,t}$	0.221	0.079	0.006	[0.063,0.379]
Constant	5.808	1.032	0.000	[3.762,7.854]
R-squared: 0.212				

Authors' elaboration.

TABLE 9

Model estimates for Brazil with the inclusion of commodity price index as an additional explanatory variable to the baseline model

Dependent variable: $Flow_{BR,t}$ Estimation method: OLS Sample: 2010:M1--2019:M12 Observations: 120				
Variable	Coefficient	Robust standard error	P-value	95% confidence interval
WX_t	-0.596	0.133	0.000	[-0.860, -0.331]
$MSCI_{BR,t}$	0.052	0.028	0.064	[0.003, 0.109]
$EMBIG_{BR,t}$	-0.005	0.009	0.532	[-0.024, 0.012]
VIX_t	-0.003	0.039	0.921	[-0.082, 0.074]
$Comm_t$	0.127	0.065	0.056	[-0.003, 0.257]
$Flow_{BR,t-1}$	0.038	0.116	0.739	[-0.192, 0.270]
Constant	0.443	0.210	0.038	[0.257, 0.860]
R-squared: 0.264				

Authors' elaboration.

TABLE 10

Model estimates for EMEs* with the inclusion of commodity price index as an additional explanatory variable to the baseline model

Dependent variable: $Flow_{EMEs^*,t}$ Estimation method: OLS Sample: 2010:M1--2019:M12 Observations: 120				
Variable	Coefficient	Robust standard error	P-value	95% confidence interval
WX_t	-2.334	0.7020	0.001	[-3.725, -0.942]
$MSCI_{EMEs,t}$	1.247	0.312	0.000	[0.629, 1.866]
$EMBIG_t$	-0.112	0.052	0.035	[-0.216, -0.008]
VIX_t	-0.022	0.330	0.945	[-0.677, 0.631]
$Comm_t$	0.434	0.354	0.223	[-0.268, 1.136]
$Flow_{EMEs^*,t}$	0.294	0.067	0.000	[0.160, 0.429]
Constant	7.177	1.196	0.000	[4.806, 9.548]
R-squared: 0.408				

Authors' elaboration.

7 CONCLUDING REMARKS

Prospects for an uneven recovery, with advanced economies recovering more quickly than most other economies, raise concerns about the effects from a non-coordinated withdrawal of monetary policy support that tightens financial conditions for emerging market economies. These concerns have been amplified by the fiscal packages in the United States, which could lead the Federal Reserve's asset purchases to be scaled back and US interest rates to rise at an earlier-than-expected date.

It is not assured that the economic recovery and interest rate normalization in advanced economies will be smooth, and central bank communications will be a critical factor as the recovery progresses. A rapid upward revision in expected US monetary policy rates could lead to rising risk premiums and significant capital outflows from emerging market economies. As such, it will be important for the Federal Reserve to continue to emphasize its policy approach and how it will implement its new monetary policy strategy to anchor expectations about its policy reaction. In general, it will be important for advanced economy central banks to signal early if they judge that economic conditions are evolving in a way that will warrant scaling back of asset purchases and, eventually, raising policy rates.

Even if global financial risk appetite remains buoyant for some time, emerging market policymakers need to keep in mind that advanced economy central banks will eventually reduce monetary policy accommodation. Even with central banks providing a high degree of transparency and early communication of changes in their policy stance, markets may still misinterpret intentions, and financial conditions can shift for reasons that are beyond the control of policymakers.

How can emerging market economies insulate themselves from external financial spillovers? Monetary policy in emerging markets could probably react countercyclically in downside scenarios. However, the strength of the policy easing could be limited and heterogenous across countries. For instance, higher public debt might discourage some countries from using Asset Purchase Programs with the same intensity as in the earlier phases of the pandemic. Moreover, if public debt and other fiscal concerns were to start weighing on the perceived independence of monetary policy and on its rules-based frameworks, the ability of central banks to deploy large conventional rate cuts without raising long-term inflation expectations could also be called into question. Maintaining credible fiscal and monetary frameworks is therefore essential for emerging market and developing economies to be able to support domestic activity amid unexpected negative shocks. In addition, taking steps to lengthen maturities on debt and smooth out concentrations in debt service obligations, manage leverage through macroprudential measures and strong financial supervision, reduce currency mismatches, and ensure an adequate level of international reserves can also help limit the buildup of vulnerabilities.

REFERENCES

CLARK, J. et al. Emerging market capital flows and U.S. monetary policy. **International Finance**, v. 23, n. 1, p. 2-17, 2019.

KOEPKE, R. Fed policy expectations and portfolio flows to emerging markets. **Journal of International Financial Markets, Institutions and Money**, v. 55, p. 170-194, July 2018.

KOEPKE, R.; PAETZOLD, S. **Capital flow data – a guide for empirical analysis and real-time tracking**. Washington: IMF, Aug. 2020. (IMF Working Paper, n. 20/171).

WU, J. C.; XIA, F. D. Measuring the macroeconomic impact of monetary policy at the zero lower bound. **Journal of Money, Credit and Banking**, v. 48, n. 2-3, p. 253-291, Mar.-Apr. 2016.

COMPLEMENTARY BIBLIOGRAPHY

AHMED, S.; ZLATE, A. Capital flows to emerging market economies: a brave new world? **Journal of International Money and Finance**, v. 48, p. 221-248, 2014.

DAHLHAUS, T.; GARIMA, V. **The impact of U.S. monetary policy normalization on capital flows to emerging-market economies**. Ottawa: Bank of Canada, Dec. 2014. (Working Paper, n. 2014-53).

FRATZSCHER, M.; LO DUCA, M.; STRAUB, R. On the international spillovers of U.S. quantitative easing. **Economic Journal**, v. 128, n. 608, p. 330-377, Feb. 2018.

GURKAYNAK, R. S. **Using federal funds futures contracts for monetary policy analysis**. Washington: Board of Governors of the Federal Reserve System, July 2005. (Finance and Economics Discussion Paper, n. 2005-29).

IMF – INTERNATIONAL MONETARY FUND. **Global financial stability report**: markets in the time of COVID-19. Washington: IMF, Apr. 2020.

_____. **World economic outlook**: managing divergent recoveries. Washington: IMF, Apr. 2021.

LIM, J. J.; MOHAPATRA, S.; STOCKER, M. **Tinker, Taper, QE, Bye?** The effect of quantitative easing on financial flows to developing countries. Washington: World Bank, Mar. 2014. (Policy Research Working Paper, n. 6820).

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