



# MONETARY AND CAPITAL MARKETS

Global Financial Stability Notes

Strains in Offshore US Dollar Funding during the COVID-19 Crisis: Some Observations

No. 2020/01

Prepared by Adolfo Barajas, Andrea Deghi, Salih Fendoglu, and Yizhi Xu

July 2020

*This note analyzes recent trends in offshore US dollar funding markets and explores the drivers of dollar funding costs during the COVID-19 pandemic crisis. Preliminary evidence suggests that only part of the sharp increase in observed dollar funding costs can be attributed to the standard supply- and demand-side factors analyzed in the October 2019 Global Financial Stability Report (GFSR), including the dollar funding fragility of non-US global banks. Changes in market structure since the global financial crisis, as well as heightened uncertainty and tensions in the commercial paper market, may provide further explanations for the movements in dollar funding costs in late March 2020. The Federal Reserve's swap line arrangements have helped lessen strains in dollar funding markets, but funding pressure remains significant for some emerging market economies, notably those without access to the swap lines. Furthermore, tighter dollar funding conditions appear to have accompanied increases in financial stress in the home economies of affected non-US global banks and to have generated adverse spillover effects in the form of cutbacks in cross-border lending.*

## INTRODUCTION

**As a result of US dollar dominance in international trade and financial transactions, disruptions in US dollar funding outside the United States have been found to have implications for global financial stability.** The US dollar is the most common invoice currency in world trade, a substantial portion of foreign exchange transactions worldwide involve US dollars (Gopinath 2015; Gopinath and Stein 2018; Bräuning and Ivashina 2019; BIS 2019), and financial flows are similarly dominated by the US dollar, with nonfinancial firms worldwide expressing a preference for financing in this currency. Furthermore, global non-US banks play a key role in US dollar lending around the world, and given that their access to stable US dollar deposits outside the United States is limited, they tend to resort to international wholesale markets, a generally shorter-term and more volatile source. Analysis in the October 2019 GFSR shows that tightness in offshore US dollar funding conditions therefore can translate into financial stress in the home economies of global non-US banks and can be transmitted to other economies via cutbacks in cross-border lending. This was the case during the 2008–09 global financial crisis.

**Strains in US dollar funding reemerged toward the end of the first quarter of 2020**, particularly after the World Health Organization (WHO) declared the COVID-19 outbreak a pandemic on March 11. This note takes stock of this episode, focusing on global non-US banks and developments in US dollar funding conditions. It first

presents recent developments in offshore US dollar funding costs in March, as reflected in a widely used measure: the cross-currency basis. It then discusses the role of traditional as well as new drivers in the surge in US dollar funding costs in March, the possible role of the Federal Reserve's announcements of swap lines with major central banks, and whether there are signs of financial stress in home economies of global non-US banks or in their cross-border lending. The focus is on broad principles for deciding when to intervene in distressed markets, rather than more specific considerations that apply to particular central banks.<sup>1</sup>

## THE CROSS-CURRENCY BASIS

---

**The cross-currency basis is a measure of tightness of US dollar funding conditions.** It is defined as the difference between the direct cost of funding in US dollar wholesale markets and the cost of synthetic US dollar funding—that is, funding in another currency and using foreign exchange derivatives to convert to US dollars. Demand for synthetic funding arises from global non-US banks filling the gap between their US dollar assets and direct funding in US dollars, and from institutional investors outside the United States who hold a significant portion of their assets in US dollars. Supply is provided by banks and, increasingly, by other financial intermediaries, such as prime money market funds. When direct US dollar funding conditions tighten, demand for synthetic dollar funding increases, widening the cross-currency basis; that is, making it more negative. The same thing occurs when the supply of synthetic US dollar funding declines. Conversely, when US dollar funding conditions are relatively loose, the basis exhibits small, or even positive, values.

## DEVELOPMENTS AS THE PANDEMIC EVOLVED

---

**Signs of stress in offshore US dollar funding markets erupted in mid-March as the COVID-19 pandemic spread across the world.** The cross-currency basis widened significantly for major advanced and emerging market economies in mid-March, with the median widening by about 55 basis points compared with early January (Figure 1, panel 1). The cross-currency basis has narrowed more recently and has moved into positive territory for several currencies, such as the euro, Japanese yen, British pound, and Swiss franc, though it remains negative and wider than last year for some emerging market currencies, such as the Malaysian ringgit and the Philippine peso.<sup>2</sup> Although the median basis at its mid-March peak was still well below what was observed during the peak of the global financial crisis, for some currencies—including the Canadian dollar, Hong Kong dollar, and Mexican peso—the widening has been larger than during the global financial crisis (Figure 1, panel 2).<sup>3</sup>

**In general, the sharp widening of the cross-currency basis coincided with the declaration of COVID-19 as a global pandemic.** The cross-currency basis started to widen across economies as the number of confirmed COVID-19 cases began to rise (Figure 2), and more sharply immediately after the WHO declared the outbreak a global pandemic on March 11, 2020. The cross-currency basis widened by about 40 basis points and 70 basis points in advanced and emerging market economies, respectively, in the week following the announcement.

---

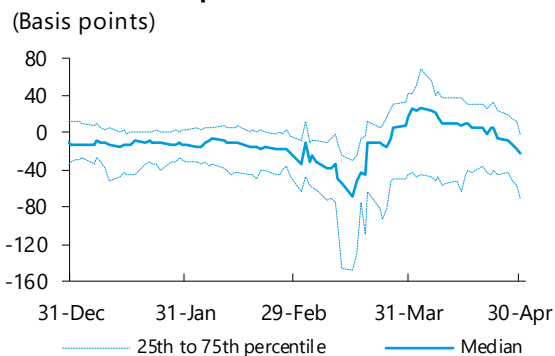
<sup>1</sup> King and others (2017).

<sup>2</sup> The currencies that have experienced the largest change from a negative basis in mid-March to a positive basis in early April include the Japanese yen, the Mexican peso, the Swiss franc, the Danish krone, and the euro. The cutoff date for the analysis in this note is April 30, 2020.

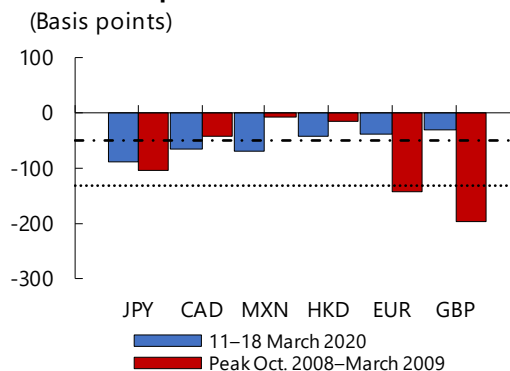
<sup>3</sup> The three-month Mexican peso basis was positive early in the global financial crisis and turned negative only in the second half of 2009; it remained mostly negative thereafter. See Bush (2019) for more details.

**Figure 1. Trends in the Cross-Currency Basis**

**1. Recent Developments**



**2. CCB Comparison with GFC Peak**

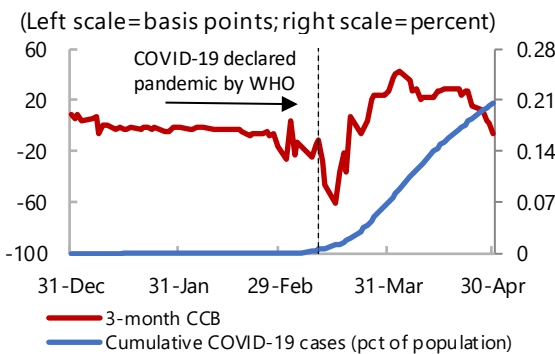


Sources: Bank for International Settlements; Bloomberg Finance L.P.; and IMF staff calculations.

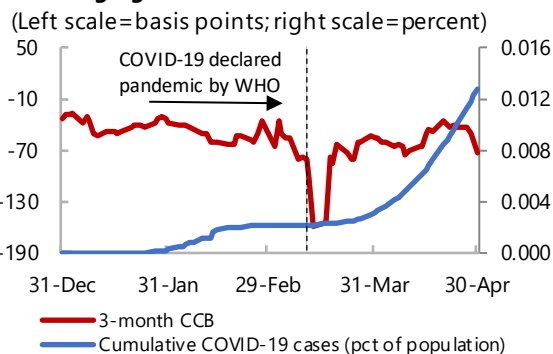
Note: The cutoff date in panel 1 is April 30, 2020. In panel 2, the average cross-currency basis (CCB) during the peak of the global financial crisis (GFC—2018:Q4–2019:Q1) is compared with the average in the period March 11–18, 2020 (when the World Health Organization declared that the outbreak was a pandemic). In panel 1, the sample comprises the Australian dollar, Brazilian real, British pound, Canadian dollar, Chinese renminbi, Danish krone, euro, Hong Kong dollar, Indian rupee, Japanese yen, Malaysian ringgit, Mexican peso, New Zealand dollar, Norwegian krone, Philippine peso, Russian ruble, Singapore dollar, South African rand, South Korean won, Swedish krona, Swiss franc, Thai baht, and Turkish lira. In panel 2, horizontal lines correspond to the sample median of the CCB during the peak of the GFC (dotted line) and in the period March 11–18, 2020 (dashed line). CAD = Canadian dollar; EUR = euro; GBP = British pound; HKD = Hong Kong dollar; JPY = Japanese yen; MXN = Mexican peso.

**Figure 2. Cross-Currency Basis and Cumulative Confirmed COVID-19 Cases**

**1. Advanced Economies**



**2. Emerging Market Economies**



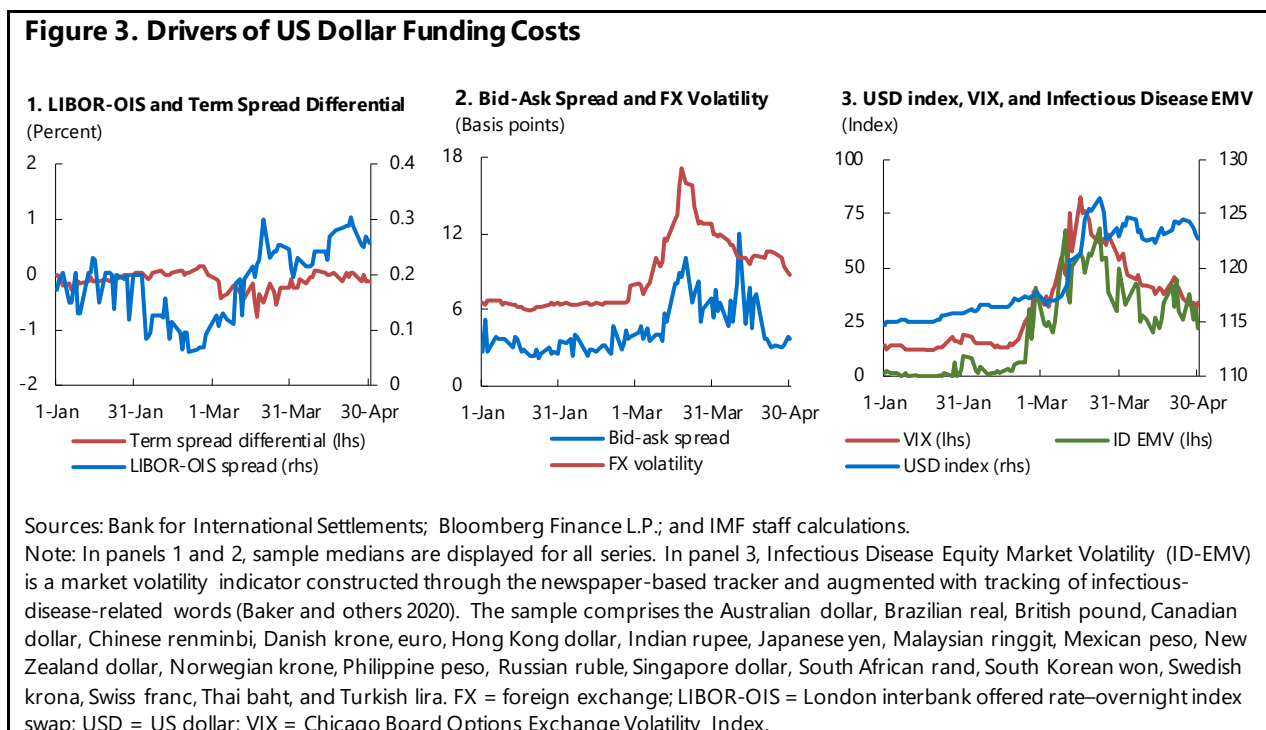
Sources: Bloomberg Finance L.P.; European Centre for Disease Prevention and Control; and IMF staff calculations.

Note: Panels 1 and 2 show the three-month cross-currency basis (CCB) based on LIBOR rates (red lines, left scale) against the cumulative number of COVID-19 cases expressed as a percentage of the population (blue line, right scale). LIBOR = London interbank offered rate; WHO = World Health Organization.

**Despite these general trends, it is worth noting that movements in the cross-currency basis have not been uniform across economies.** For example, among advanced economies, the Japanese yen widened by about 80 basis points in the week following the WHO announcement, compared with 43 basis points for the Canadian dollar. Likewise, in the emerging market group, the Malaysian ringgit and Philippine peso basis widened by about 90 basis points, but the Mexican peso by only 30 basis points.

## DRIVERS OF THE CROSS-CURRENCY BASIS

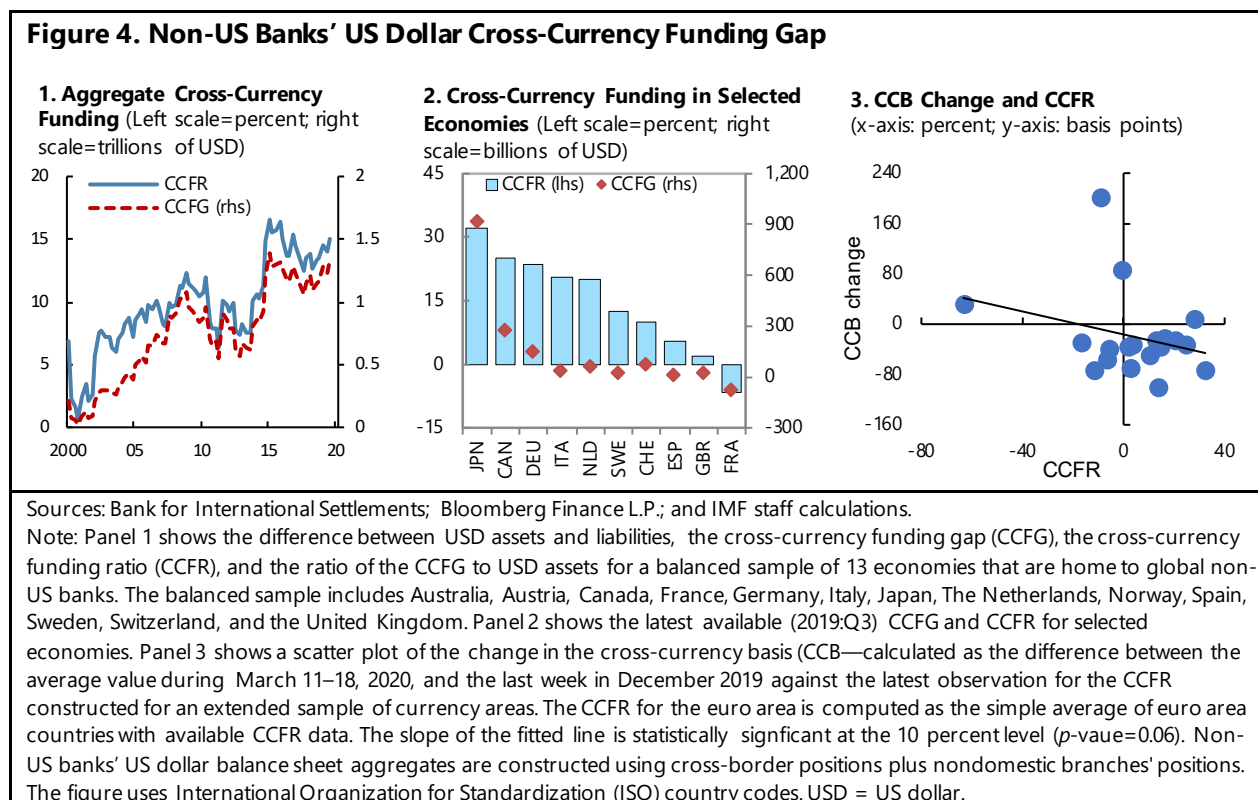
Previous research, including in the October 2019 GFSR, has identified a set of factors that generally drive the variation in the movement of the cross-currency basis across economies. Most of these factors moved in the direction of widening the cross-currency basis in March 2020. For example, increases in the term spread differential (as the Federal Reserve drastically reduced the target interest rate in response to the COVID-19 crisis), the broad US dollar index, and the bid-ask spread have exerted upward pressure on US dollar funding costs (Figure 3, panels 1 and 2). The London interbank offered rate–overnight index swap (LIBOR-OIS) spread, which reflects the freezing up of short-term funding markets in the United States, also has a widening effect on the cross-currency basis, as does the rising implied volatility of domestic currencies of the home economies. By contrast, the rapid increase in the Chicago Board Options Exchange Volatility Index (VIX), from about 10 in early January to above 80 in late March (Figure 3, panel 3), is expected to have a narrowing effect, by dampening the demand for risky investments denominated in dollars.<sup>4</sup>



**Country-specific funding vulnerability—proxied by the gap between US dollar assets and liabilities—also seems to have played a role in influencing the cross-currency basis.** As shown in the October 2019 GFSR, the gap between US dollar assets and liabilities, known as the cross-currency funding gap, is an important driver of the potential need for non-US banks to resort to synthetic dollar funding. The aggregate cross-currency funding gap and the gap scaled by US dollar assets, known as the cross-currency funding ratio, have increased for many countries. However, there is considerable variation across economies (Figure 4,

<sup>4</sup> As shown in the October 2019 GFSR, an increase in the VIX is likely to reduce demand for risky investments denominated in US dollars, thereby alleviating pressure on the cross-currency basis. This is because the estimated model controls for domestic risk in home economies through a measure of implied foreign exchange volatility so that the VIX captures the riskiness of dollar-denominated assets.

panels 1 and 2). Notably, economies with a higher cross-currency funding ratio before the onset of the current pandemic (such as Japan) have experienced a significantly wider cross-currency basis (Figure 4, panel 3).<sup>5</sup>



**The standard drivers of the cross-currency basis, however, explain only part of the variation.** Comparing the actual cross-currency-basis average value in March with predictions generated from a model including the standard drivers as explanatory variables reveals that a portion of the widening remains unexplained. Predicted values point to a substantial narrowing of the cross-currency basis in five of the nine analyzed currencies, whereas the cross-currency basis has in fact widened in all but one (Figure 5, panel 1).<sup>6</sup> In general, the March prediction error is in the ballpark of what was observed when the basis was at its peak during the global financial crisis (Figure 5, panel 2), although in some of the currencies (such as the Canadian dollar, Hong Kong dollar, Japanese yen, and Malaysian ringgit), the error was noticeably larger in March.

**The prediction errors in the recent period suggest that there are other factors at play.** These may include a magnified impact of existing vulnerabilities as the risk-off sentiment intensified, an overreaction in US dollar funding markets, or the unprecedented increase in uncertainty caused by the pandemic as reflected in the Infectious Disease Equity Market Volatility Index (Figure 3, panel 3).<sup>7</sup> Furthermore, the COVID-19 shock differs in nature from that of the global financial crisis, which was a financial sector shock that propagated from US

<sup>5</sup> The October 2019 GFSR shows that the cross-currency funding ratio amplifies the effect of other drivers on the cross-currency basis. Thus, for the same increase in a given driver, a country with a larger cross-currency funding ratio tends to experience larger widening of the cross-currency basis. However, due to data limitations, the cross-currency funding ratio can be computed only up to the third quarter of 2019 for some currencies, the first quarter of 2018 for others.

<sup>6</sup> Predictions are generated for currencies for which data are available for all relevant variables in the baseline model.

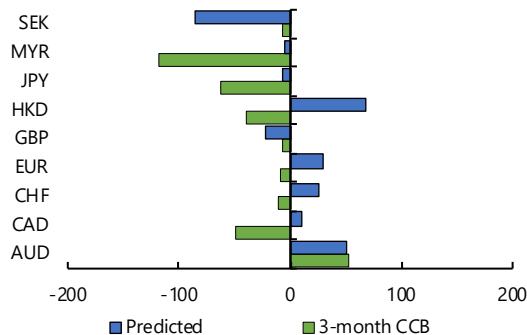
<sup>7</sup> The Infectious Disease Equity Market Volatility Index, developed by Baker, Bloom, Davis, and Terry (2020), combines three indicators: stock market volatility, newspaper-based economic uncertainty, and newspaper-based tracking of infectious-disease-related words to capture real-time forward-looking uncertainty related to the spread of infectious diseases.

short-term funding markets to global US dollar funding markets. In the current episode, the shock pertains to the real sector, which is increasingly causing liquidity shortages for companies fighting to stay afloat amid a shutdown in activity while at the same time reducing demand for credit for international trade purposes or cross-border investment activities. In addition, there has been unprecedented fiscal and monetary policy support in the United States and across the world. As a result of the multiple factors at play, the nature, scale, and speed of propagation of this shock may not be fully captured by traditional models.<sup>8</sup>

**Figure 5. Actual and Predicted Cross-Currency Basis: Standard Model**

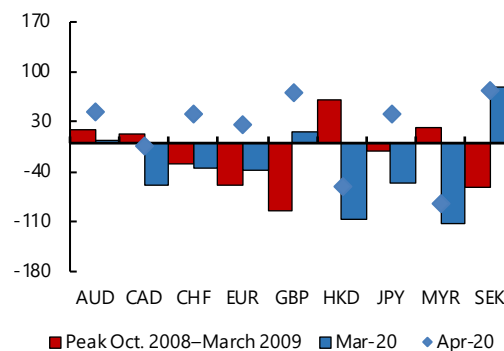
**1. Actual and Predicted CCB in March 2020**

(Basis points)



**2. Residuals Comparison with the Global Financial Crisis**

(Basis points)



Sources: Bank for International Settlements; Bloomberg Finance L.P.; and IMF staff calculations.

Note: Panel 1 compares the average of the actual three-month cross-currency basis in March 2020 with the predicted value obtained from the standard model (i.e., the October 2019 *Global Financial Stability Report* model) estimated over 2006:M1–2020:M4. Panel 2 compares the forecast error (“residuals”; i.e., actual cross-currency basis minus the predicted value) in March and April with the average in-sample prediction error during the peak months of the global financial crisis. AUD = Australian dollar; CAD = Canadian dollar; CCB = cross-currency basis; CHF = Swiss franc; EUR = euro; GBP = British pound; HKD = Hong Kong dollar; JPY = Japanese yen; MYR = Malaysian ringgit; SEK = Swedish krona.

## STRUCTURAL DEVELOPMENTS SINCE THE GLOBAL FINANCIAL CRISIS

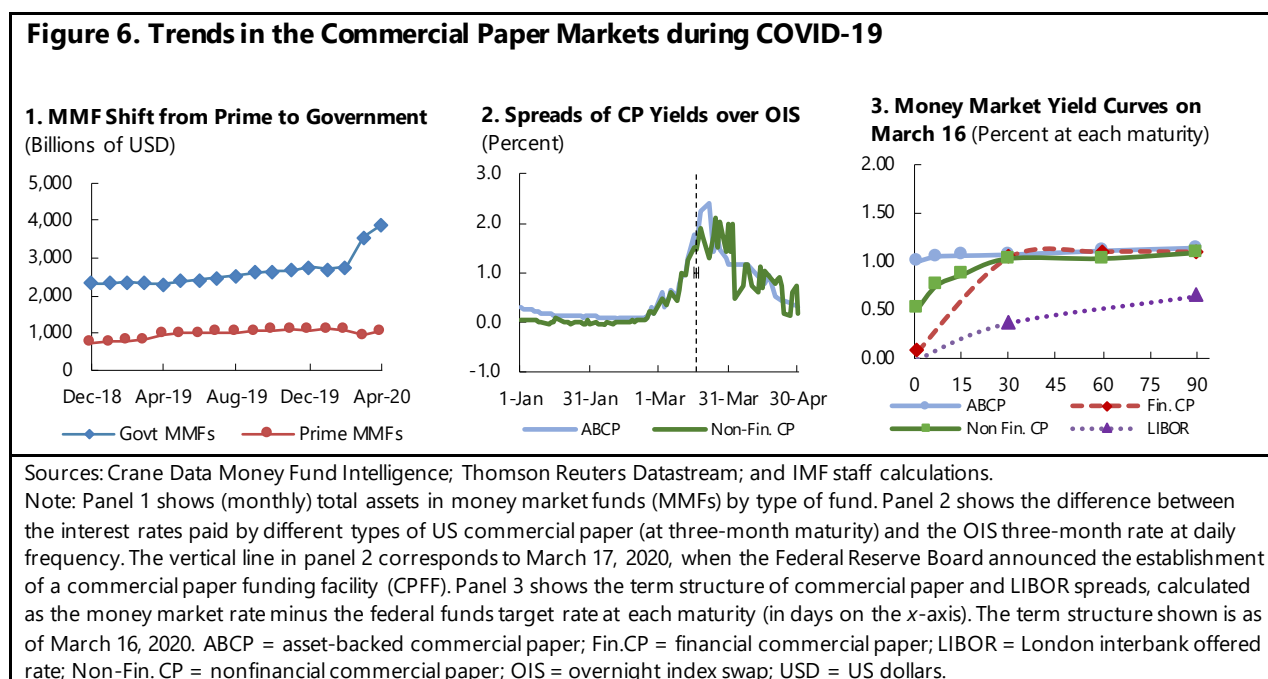
**Certain developments in the market structure since the global financial crisis may have contributed to the recent tightening in US dollar funding markets.** First, institutional investors, including insurers and pension funds, hold globally diversified portfolios and engage in swap agreements to strategically hedge foreign currency investments. In recent years, their portfolios have surged along with their hedging needs. As reported in the Bank for International Settlements semiannual Over-The-Counter Derivatives Statistics, the total notional amounts outstanding for foreign exchange contracts at the end of June 2019 were \$92 trillion, with foreign currency swaps estimated to account for about 30 percent of outstanding notional amounts.<sup>9</sup> Anecdotal evidence suggests that institutional investors may have contributed to about 65 percent of the increase in local hedging demand since the global financial crisis (Goldman Sachs 2018). Nonfinancial firms seeking to borrow opportunistically in markets where credit spreads are narrower could also prop up the demand for synthetic dollar funding in order to avoid currency mismatches (Borio and others 2016). This is particularly relevant in emerging market economies, where increasing reliance of firms and quasi-sovereigns on dollar liquidity has also been rising rapidly in the past decade.<sup>10</sup>

<sup>8</sup> Additional specifications of the model were estimated that included nonlinear terms for the VIX, as well as its interaction with variables such as the cross-currency funding ratio. These augmentations helped improve the fit of the model and lower the forecast error for a majority of currencies.

<sup>9</sup> See <https://stats.bis.org/statx/srs/table/d6?f=pdf>.

<sup>10</sup> Chui, Kuruk, and Turner (2016), for example, provide evidence that foreign currency liabilities of emerging market firms are likely not fully hedged by foreign currency revenue or foreign exchange derivatives. Bruno and Shin (2017, 2020) show evidence on emerging market

**The size of the nonfinancial commercial paper market, which has exhibited considerable stress during the current episode, has also increased almost threefold over the past decade.** With the unfolding of the COVID-19 pandemic, there has been a dramatic shift by money market investors away from prime money market funds into government money market funds (Figure 6, panel 1). Because prime money market funds are important investors in commercial paper, the outflow has contributed to a sharp increase in funding costs in commercial paper markets (Figure 6, panel 2). This has further tightened the funding available for large corporations, notably foreign firms seeking direct US dollar funding. Stress in this market has likely put additional strain on obtaining synthetic US dollar funding from foreign currency swap markets. Furthermore, tightening in the commercial paper market has also led corporate borrowers to draw down credit lines from global US banks, reducing their capacity to supply foreign currency hedging.



**The overall strain in the prime commercial paper market was accompanied by a squeeze toward shorter maturities, which would increase the rollover risk of US dollar funding for both firms and banks.** At the beginning of 2020, yield spreads of commercial paper instruments over the target federal funds rate at different maturities were in general very low and with an almost flat term structure. As of March 16, 2020, however, the three-month spreads for nonfinancial and financial commercial paper rose to more than 110 basis points (Figure 6, panel 2). Responding to the market strains, the Federal Reserve introduced a new commercial paper funding facility similar to that used during the global financial crisis. Despite the minimal initial use of the facility due to its pricing,<sup>11</sup> the intervention seems to have helped ease pressure in the market.

nonfinancial firms' tendency to engage in US dollar carry trade and how such activity combined with their building of cash balances may make them more vulnerable to a stronger US dollar.

<sup>11</sup> The initial pricing to access the facility was the three-month OIS rate plus 200 basis points, whereas the three-month financial, nonfinancial, and asset-backed commercial paper three-month rates were well below the OIS rate plus 200 basis points at the time of the policy announcement.

## IMPACT OF CENTRAL BANK SWAP LINES

---

**To alleviate the growing stress in US dollar funding markets, the Federal Reserve enhanced dollar liquidity arrangements with foreign central banks.** On March 15, 2020, the Federal Reserve announced a coordinated action with five central banks (Bank of Canada, Bank of England, Bank of Japan, European Central Bank, Swiss National Bank) to enhance the provision of liquidity by lowering the pricing on standing US dollar liquidity swap arrangements by 25 basis points.<sup>12</sup> Given the continued pressure in the markets, however, the Federal Reserve announced additional swap lines on March 19, 2020, with nine other central banks/monetary authorities (Australia, Brazil, Denmark, Korea, Mexico, New Zealand, Norway, Singapore, Sweden).

**The swap lines appear to have had a significant impact on US dollar funding conditions.** Results from a regression equation that controls for the standard drivers as well as two additional domestic variables, the banking system expected default frequency and the ratio of international reserves to GDP, show that the announcements are associated with a significant narrowing of the cross-currency basis by about 80 basis points for swap line currencies, including those with outstanding swap lines and those that gained access to the new swap lines. On the other hand, the effect on non-swap-line currencies is not statistically significant (Figure 7, panel 1).<sup>13,14</sup>

---

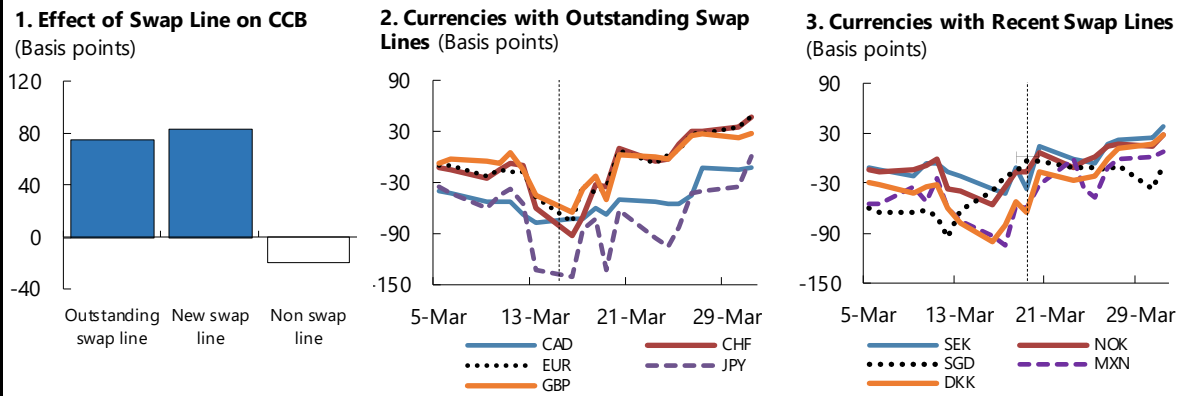
<sup>12</sup> To increase the swap lines' effectiveness, the foreign central banks with standing US dollar liquidity operations also agreed to begin offering US dollars weekly in each jurisdiction, with 84-day maturity, in addition to one-week-maturity operations already in place. The changes took effect during the week of March 16, 2020.

<sup>13</sup> These results are consistent with those obtained by Cetorelli, Goldberg, and Ravazzolo (2020), who undertook event studies on the effects of policy announcements of the Federal Reserve swap line on the cross-currency basis within a two-day window.

<sup>14</sup> It should be noted that around the time of the swap line announcements, other policy actions were taken both by the Federal Reserve and on the fiscal front, which may have helped improve investor risk sentiment and may have had an impact on US dollar funding conditions. In particular, on March 31, the Federal Reserve also announced the establishment of a temporary repurchase agreement facility for foreign central banks and other international monetary authorities (FIMA Repo Facility), which allows foreign and international monetary authority (FIMA) account holders to enter into repurchase agreements with the Federal Reserve to temporarily exchange their US Treasury securities held with the Federal Reserve for US dollars. The facility became effective April 6, 2020, but information on individual repurchases by the FIMA account holders is not publicly available for a meaningful analysis of its impact.



**Figure 7. Effect of New Swap Line Announcements**



Sources: Bloomberg Finance L.P.; and IMF staff calculations.

Note: Panel 1 shows the estimated impact of the recent swap line announcements on the three-month cross-currency basis (CCB), controlling for foreign exchange implied volatility, the bid-ask spread, the US dollar index, the Chicago Board Options Exchange Volatility Index, the expected default frequency of the home economy banking sector, the London interbank offered rate–overnight index swap (LIBOR-OIS) spread, and the international-reserves-to-GDP ratio. Coefficients are estimated using a staggered difference-in-difference model over the period February 1, 2020, to April 30, 2020. Two treatment groups are defined for the currencies with outstanding swap lines and those with new swap lines agreements. Post-period dummies are defined accordingly. The dates of the announcements are (1) March 15, when the central banks of Canada, the euro area, Japan, Switzerland, the United Kingdom, and the United States enhanced the provision of liquidity via the standing US dollar liquidity swap line arrangements and (2) March 19, when the Federal Reserve announced the establishment of new temporary US dollar swap lines with nine additional central banks. Swap line currencies correspond to the Australian dollar, Brazilian real, Canadian dollar, Danish krone, euro, British pound, Japanese yen, Mexican peso, New Zealand dollar, Norwegian krone, Singapore dollar, South Korean won, Swedish krona, and Swiss franc. Non-swap-line currencies correspond to the Chinese renminbi, Hong Kong dollar, Indian rupee, Israeli shekel, Malaysian ringgit, Philippine peso, Russian ruble, South African rand, and Thai baht. LIBOR-OIS spread series are replaced with the sample median for advanced or emerging market economies when missing. A solid bar denotes significance at 10 percent or lower. Panels 2 and 3 show the three-month CCB for selected currencies in the period around the swap line announcements. Vertical lines indicate the date of the swap line announcements. CAD = Canadian dollar; CHF = Swiss franc; DKK = Danish krone; EUR = euro; GBP = British pound; JPY = Japanese yen; MXN = Mexican peso; SEK = Swedish krona; NOK = Norwegian krone; SGD = Singapore dollar.

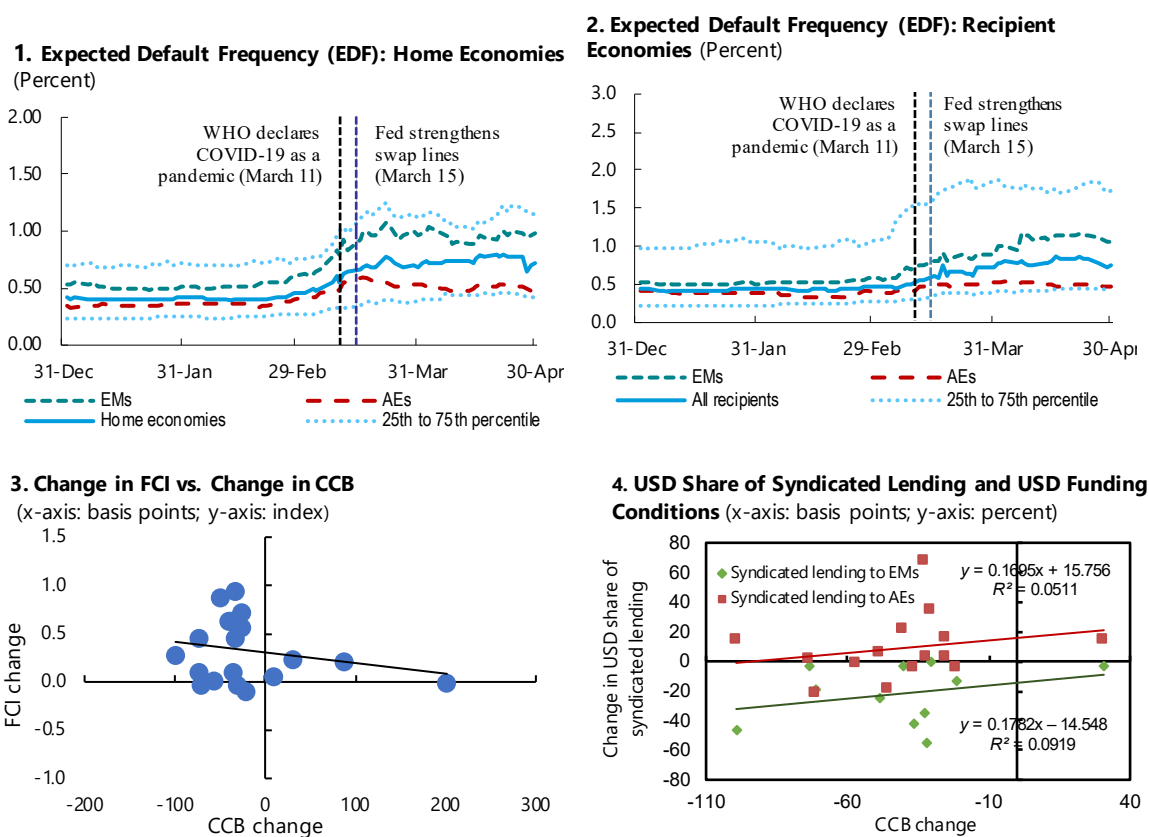
## HOME COUNTRY FINANCIAL STRESS AND SPILLOVER EFFECTS

**An increase in US dollar funding costs tends to be associated with intensifying financial stress in the home economies of global non-US banks.** The analysis in the October 2019 GFSR shows that an increase in US dollar funding costs is generally associated with intensifying financial stress in the home economies of global non-US banks, as reflected in measures of financial sector risk such as expected default frequency. The March 2020 episode follows this pattern, with the tightening of US dollar funding conditions accompanied by an increase of about 0.3 percentage point in the expected default frequency in home economy banking systems (Figure 8, panel 1). On average, the increase has been larger for emerging market economies that are home to global non-US banks than for advanced home economies (0.4 versus 0.2 percentage point, respectively).

**Expected default frequency has responded little to swap line arrangements.** Although expected default frequency in advanced home economies appears to have declined after March 15, 2020, the difference between the average pre- and post-swap-line expected default frequency is statistically insignificant, which suggests that a host of other factors affecting banking systems may be weighing in.<sup>1</sup>

<sup>1</sup> The effects of the swap line announcement are difficult to separate from those of Federal Reserve policies providing liquidity to the market around that time, but this result holds if other factors, such as the bid-ask spread, the US dollar index, and the VIX, are included in the model

**Figure 8. Financial Stress in Home and Recipient Economies**



Sources: Bloomberg Finance L.P.; Dealogic; Haver Analytics; Moody's Analytics CreditEdge; and IMF staff calculations. Note: Panel 1 shows the average expected default frequency (EDF) of banking systems for a sample of 24 home economies based on the October 2019 *Global Financial Stability Report*, Chapter 5. Panel 2 shows the average bank EDF for a total of 27 recipient economies. Panel 3 shows the relationship between the change in the domestic financial conditions index (FCI) during 2020:Q1 and the change in the cross-currency basis (CCB) calculated as the difference between the average value during the period March 11–18, 2020, and the last week in December 2019 covering all economies (both home and recipient) with available data for a total of 19 observations. The slope of the fitted line is statistically significant at the 10 percent level ( $p$ -value=0.06) in panel 3. Panel 4 shows the change in the share of US dollar lending in total syndicated lending (between end-December 2019 and end-March 2020) against the change in the average CCB during December 24–31, 2019, and March 11–19, 2020, controlling for the average US dollar lending share in 2019 for both advanced economy (AE, red dashes) and emerging market (EM, green dashes) borrowers. Each dot represents a lending country. The sample includes Australia, Canada, China, Denmark, the euro area, Hong Kong SAR, India, Japan, Korea, Malaysia, Norway, Singapore, Sweden, Switzerland, and the United Kingdom. The slope of both fitted lines is statistically significant at the 5 percent level. Fed = Federal Reserve; USD = US dollar; WHO = World Health Organization.

**Tighter US dollar funding conditions are also associated with an uptick in financial stress in recipient economies.** Banking system expected default frequency in recipient economies has increased by about 0.4 percentage point on average since the end of February (Figure 8, panel 2). As with home economy financial stress, the impact on recipient economies has been greater for emerging markets, with an average increase in expected default frequency of 0.8 percentage point. The rise in financial stress across home and recipient

to capture the possible impact of other policies on liquidity conditions and broader risk sentiment. Among others, another concurrent factor driving banks' expected default frequency is the degree of riskiness of their loan portfolios. Elevated credit risks at the outset of the crisis may also partially mute the effect of swap lines on home/recipient economy bank expected default frequency.

economies is also manifested in a tightening of domestic financial conditions, which turns out to be positively correlated with widening of the cross-currency basis (Figure 8, panel 3).

**The financial strains arising in recipient economies may be at least partly attributed to the retrenchment in cross-border lending.** Available syndicated-loan-level data suggest that the US dollar share of this lending declined in the first quarter of 2020 and that this decline was more pronounced for home economies experiencing sharper widening of the cross-currency basis. Furthermore, emerging market economy borrowers were particularly affected by this decline in lending (Figure 8, panel 4).<sup>2</sup>

## CONCLUSION

---

The COVID-19 crisis undoubtedly resulted in tighter US dollar funding conditions, on balance affecting financial systems throughout the world. The preliminary analysis presented here suggests the following:

- The sharp increase in US dollar funding costs that materialized in mid-March—as evidenced by the widening cross-currency basis for many major currencies—could be partly explained by the standard drivers of the cross-currency basis. Several factors, such as an increase in the term spread differential, the broad US dollar index, the bid-ask spread, and the LIBOR-OIS spread, have exerted upward pressure on US dollar funding costs. The sharp jump in the VIX has operated in the opposite direction, as suggested by the model presented in the October 2019 GFSR.
- Predictions based on standard cross-currency-basis models tend to underestimate the actual widening that took place. Although the prediction error is not too far out of line with what was observed during the global financial crisis, a number of factors may explain the visibly sharper widening during March: structural changes in dollar funding markets over the past 10 years and an unprecedented level of pandemic-related uncertainty, together with disruptions to the commercial paper market during the recent episode.
- Also relevant are the differences between the recent COVID-19 shock and that of the global financial crisis—in particular the implications in terms of firms' solvency rather than their liquidity—which underscores the need for better understanding of the transmission channels and associated vulnerabilities beyond the commonly recognized demand and supply drivers for synthetic US dollar funding. As more data become available, further research could revisit the drivers of the cross-currency basis in light of the recent experience.
- The Federal Reserve's swap line arrangements have helped lessen strains in US dollar funding markets, leading to a narrowing of the cross-currency basis. On average, the cross-currency basis reverted to zero in April, though for some emerging market economies, it is still wider than historical norms.
- Tighter US dollar funding conditions have coincided with some financial stress in the home economies of affected non-US global banks, as indicated by the uptick in banking sector expected default frequency during the first quarter of 2020. Of course, US dollar liquidity is only one factor weighing on these banking systems, but it could undermine their resilience if the situation worsens.
- Tight dollar liquidity conditions, moreover, have also been associated with negative spillovers to economies that borrow in US dollars—with available information suggesting that home economies affected more by the rise in dollar funding costs have tended to shift away from US dollar cross-border lending, especially to emerging market economy borrowers. Consequently, financial conditions in recipient economies have also deteriorated.

---

<sup>2</sup> Complementing syndicated loan data with fund portfolio flows data, the analysis shows that the sharp decline in bond and equity flows to emerging markets during the first quarter of 2020 is also associated with the widening of the cross-currency basis in lending economies.

## REFERENCES

- Avdjiev, S., W. Du, C. Koch, and H. S. Shin. 2019. "The Dollar, Bank Leverage and the Deviation from Covered Interest Parity." *American Economic Review: Insights*, 1 (2): 193–208.
- Baker, S. R., N. Bloom, S. J. Davis, and S. J. Terry, 2020. "COVID-Induced Economic Uncertainty," NBER Working Papers 26983, National Bureau of Economic Research, Inc.
- Baker, S.R., N. Bloom, S.J. Davis, K. Kost, M. Sammon, and T. Viratyosin. 2020. "The Unprecedented Stock Market Impact of Covid-19." NBER Working Paper 26945, National Bureau of Economic Research, Cambridge, MA.
- Bank for International Settlements (BIS). 2019. Triennial Central Bank Survey of Foreign Exchange and Over-the-Counter (OTC) Derivatives Markets in 2019. Basel. <https://www.bis.org/statistics/rpfx19.htm>.
- Borio, Claudio, Robert N. McCauley, Patrick McGuire, and Vladyslav Sushko. 2016. "Covered Interest Parity Lost: Understanding the Cross-Currency Basis." *BIS Quarterly Review* (September): 45–64.
- Bräuning, Falk, and Victoria Ivashina. 2019. "U.S. Monetary Policy and Emerging Market Credit Cycles." *Journal of Monetary Economics* 112 (June): 57–76.
- Bruno, Valentina, and Hyun Song Shin. 2017. "Global Dollar Credit and Carry Trades: A Firm-Level Analysis." *Review of Financial Studies* 30 (3): 703–49.
- Bruno, Valentina, and Hyun Song Shin. 2020. "Currency Depreciation and Emerging Market Corporate Distress." *Management Science* 66 (5): 1783–2290.
- Bush, Georgia. 2019. "Bank Foreign Currency Funding Gap and Currency Markets: The Case of Mexico Post GFC." Banco de México Working Paper, Mexico City.
- Cetorelli, Nicola, Linda S. Goldberg, and Fabiola Ravazzolo. 2020. "Have the Fed Swap Lines Reduced Dollar Funding Strains during the COVID-19 Outbreak?" Liberty Street Economics. Federal Reserve Bank of New York, May 22.
- Chui, Michael, Emese Kuruc, and Philip Turner. 2016. "A New Dimension to Currency Mismatches in the Emerging Markets Non-Financial Companies." BIS Working Papers 550, Bank for International Settlements, Basel.
- Goldman Sachs. 2018. "A New Barrier to Capital Flows: USD-Funding Premium." Asia Economic Analyst, Seoul.
- Gopinath, Gita. 2015. "The International Price System." In *Jackson Hole Symposium 27*, Federal Reserve Bank of Kansas City, 71–150.
- Gopinath, Gita, and Jeremy C. Stein. 2018. "Banking, Trade, and the Making of a Dominant Currency." NBER Working Paper 24485, National Bureau of Economic Research, Cambridge, MA.
- International Monetary Fund (IMF). 2019. "Banks' Dollar Funding: A Source of Financial Vulnerability." *Global Financial Stability Report*. Washington, DC, October.
- King, Darryl, Luis Brandao-Marques, Kelly Eckhold, Peter Lindner, and Diarmuid Murphy. 2017. "Central Bank Emergency Support to Securities Markets." IMF Working Paper 17/152, International Monetary Fund, Washington, DC.