

INTERNATIONAL MONETARY FUND

# Macro-Financial Stability in the COVID-19 Crisis: Some Reflections

Tobias Adrian, Fabio M. Natalucci, and Mahvash S. Qureshi

WP/22/251

**IMF Working Papers describe research in progress by the author(s) and are published to elicit comments and to encourage debate.**

The views expressed in IMF Working Papers are those of the author(s) and do not necessarily represent the views of the IMF, its Executive Board, or IMF management.

**2022  
DEC**



WORKING PAPER

**IMF Working Paper**

Monetary and Capital Markets Department

**Macro-Financial Stability in the COVID-19 Crisis: Some Reflections**  
**Prepared by Tobias Adrian, Fabio M. Natalucci, and Mahvash S. Qureshi\***

December 2022

**IMF Working Papers describe research in progress by the author(s) and are published to elicit comments and to encourage debate.** The views expressed in IMF Working Papers are those of the author(s) and do not necessarily represent the views of the IMF, its Executive Board, or IMF management.

**ABSTRACT:** The global financial system has shown remarkable resilience during the COVID-19 pandemic, despite a sharp decline in economic activity and the initial financial market upheaval in March 2020. This paper takes stock of the factors that contributed to this resilience, focusing on the role of monetary and financial policies. In response to the pandemic-induced crisis, major central banks acted swiftly and decisively, cutting policy rates, introducing new asset purchase programs, providing liquidity support for the banking system, and creating several emergency facilities to sustain the flow of credit to the real economy. Several emerging market central banks also deployed asset purchase programs for the first time. While the pandemic crisis has underscored the importance of policies in preventing calamitous financial outcomes, it has also brought to the fore some unintended consequences of policy actions—in particular, of providing prolonged monetary policy support and applying regulation to specific segments of the financial system rather than taking a broader approach—that could undermine financial stability in the future.

JEL Classification Numbers:	E30, E44, E52, F32, G15
Keywords:	COVID-19 pandemic crisis; monetary policy; financial stability; emerging markets
Authors' E-Mail Addresses:	<a href="mailto:TAdrian@imf.org">TAdrian@imf.org</a> , <a href="mailto:FNatalucci@imf.org">FNatalucci@imf.org</a> , and <a href="mailto:MQureshi@imf.org">MQureshi@imf.org</a>

\* We are grateful to IMF colleagues for helpful comments and suggestions and to Mustafa Yenice for excellent research assistance. The usual disclaimer applies.

WORKING PAPERS

# **Macro-Financial Stability in the COVID-19 Crisis: Some Reflections**

Prepared by Tobias Adrian, Fabio M. Natalucci, and Mahvash S. Qureshi

# Contents

<b>I. Introduction .....</b>	<b>3</b>
<b>II. On the Brink.....</b>	<b>5</b>
<b>III. Spectacular Rebound .....</b>	<b>6</b>
<b>IV. Supporting Factors.....</b>	<b>8</b>
<b>V. Unintended Consequences .....</b>	<b>9</b>
<b>VI. Sustaining Global Financial Stability: Key Lessons and Future Priorities .....</b>	<b>14</b>
<b>References.....</b>	<b>20</b>

## FIGURES

1. Asset Market Performance during the COVID-19 Pandemic .....	16
2. Portfolio Flows and Financial Conditions in Emerging Market and Developing Economies .....	16
3. Central Bank Asset Purchases during COVID-19 Pandemic.....	16
4. Central Bank Policy Interventions and Rebound in Asset Prices.....	17
5. EMDE Portfolio Flows and Sovereign Credit Spreads .....	17
6. Banking Sector Soundness in Advanced Economies and EMDEs .....	17
7. Policy Credibility and Monetary Policy Response during the COVID-19 Pandemic .....	18
8. External Buffers and Currency Depreciation in Emerging Markets during the COVID-19 Pandemic .....	18
9. Financial Vulnerabilities during the COVID-19 Pandemic.....	18
10. Inflation and Policy Rate during the COVID-19 Pandemic.....	19
11. Actual and Projected Inflation and Real GDP Growth in the U.S. and Eurozone .....	19

## I. INTRODUCTION

At the onset of the COVID-19 pandemic in March 2020, financial markets went into a tailspin. Global stock markets plunged and borrowing costs soared, as investors took fright at the growing economic damage and uncertainty about future economic outlook. However, despite the initial financial market turmoil of historic proportions, and subsequent months of major economic upheaval with thousands of businesses shuttered, millions of livelihoods lost, and the worst economic recession in nearly a century, the global financial system remained stable. What factors explain this resilience? What risks remain? And what are the key lessons learnt from this experience for maintaining financial stability in the future? In this paper, we address these questions by systematically analyzing key developments in global financial markets since the onset of the pandemic, and assessing the role of policies—in particular, of monetary and financial policies—in maintaining global financial stability.

We argue that policies introduced during the pandemic-induced economic crisis, but also the strong policy frameworks in place before the crisis hit, helped to contain the financial fallout from the pandemic. The swift and unprecedented policy support provided by major central banks in the aftermath of the pandemic, backed by fiscal support and easing of financial regulations, was instrumental in maintaining the flow of credit to the private sector and preventing the economic collapse from morphing into a financial crisis. Central banks responded quickly and decisively, delving deeper into their toolkits and deploying a variety of conventional and unconventional measures to unleash liquidity that helped restore confidence and stabilized financial markets. Their actions were reinforced by the strong monetary and financial frameworks already in place in many economies—manifested in sound domestic banking sectors, policy credibility and, for emerging markets, sizable external buffers.

However, the pandemic crisis has also brought to the fore some unintended consequences of policies that need to be addressed to strengthen future resilience. First, while accommodative monetary policies helped to ease financial conditions and stimulated output in the short term, they also encouraged excessive risk-taking and increased financial vulnerabilities—notably, nonfinancial sector leverage and stretched asset valuations—that could pose risks to macro-financial stability in the future. In this context, it is worth noting that financial vulnerabilities were already elevated in the runup to the pandemic on the back of extremely low interest rates and low market volatility resulting from loose monetary policies pursued by major central banks since the global financial crisis—and that is likely to have amplified the market turmoil observed in the early days of the pandemic. Central banks thus had to make historically large interventions to ease market stress, which, in turn, aggressively boosted risk appetite and further exacerbated these vulnerabilities over time. Loose monetary policy for an extended period of time thus poses an intertemporal trade-off, which needs to be addressed by the development and timely deployment of other tools, notably macroprudential policies, to rein in vulnerabilities and risks.

Second, combined with outsized fiscal support and supply-side shocks, the persistently accommodative monetary policy stance of major central banks since the pandemic has contributed to inflationary pressures of the kind not seen in the past several decades. This has

raised complex questions regarding the conduct of monetary policy such as on the optimal timing and pace of monetary policy normalization during economic recoveries, as well as the appropriate monetary policy frameworks for central banks at a time of decades-high inflation. While central banks may be wary of normalizing monetary policy too soon after recessions even if inflationary pressures emerge, especially if the source of such pressures is uncertain, the history of monetary policy in the 1970s and early 1980s in the United States has shown the risks of letting inflation persist and the significant economic costs involved in bringing it down. Central banks should act once inflation becomes broad-based and persistent to avoid inflationary pressures from becoming entrenched and a de-anchoring of inflation expectations. This is particularly important if uncertainty surrounds the duration of supply-side shocks driving inflation, if the economy is overheating, and if other policies (notably, fiscal) continue to be supportive. Furthermore, central banks need to adopt robust policy frameworks that take into account both downside and upside risks to inflation to preserve their credibility.

Third, the cross-border spillovers of monetary policies pursued by major central banks in the form of capital flow volatility continues to be a major challenge for emerging market and developing economies (EMDEs). Amidst easy global financial conditions prevailing before the pandemic, capital flows to EMDEs had surged, but they came to a sudden stop in March 2020 as pandemic-related frenzy took over financial markets. This led to a spike in sovereign spreads, depreciation pressures on domestic currencies, and a significant tightening in domestic financial conditions. The stress, however, was short-lived as capital flows recovered after the U.S. Federal Reserve's massive policy intervention but capital flows have been volatile since—and have reversed sharply in 2022 as advanced economies have started to normalize monetary policy. The repeated boom-bust cycles in capital flows to EMDEs underscore the importance of maintaining strong macroeconomic and financial policy frameworks in recipient economies, and of proactively managing capital flow volatility to mitigate financial stability risks.

Finally, the March 2020 market turmoil has also exposed some unintended consequences of regulatory reforms targeting a specific segment of the financial system in the form of risk migration to other less regulated segments. For example, following the global financial crisis, reforms were introduced to strengthen the regulation, supervision, and risk management practices of the banking sector. These reforms have helped to make banks more resilient globally, with higher capital and liquidity, but they have also pushed some intermediation activities, and their inherent risks, to the nonbank financial sector. The vulnerabilities associated with some of these nonbank financial institutions (NBFIs), in particular open-ended funds holding illiquid assets, amplified market stress at the onset of the pandemic leading to a liquidity crunch (“dash-for-cash”) that was alleviated only after massive interventions by central banks. The experience has reinforced the need to expand the regulatory perimeter to include these institutions to mitigate their systemic risks.

This paper makes several contributions to the literature. While a burgeoning body of literature has analyzed the near-term impact of central bank actions in response to the COVID-19 pandemic on specific aspects of financial and nonfinancial sectors, we take stock of the broader macro-financial effects of these actions, assessing both the intended and some of the key

unintended consequences that have unfolded thus far.<sup>1</sup> Such an overview is important as the economic effects of the pandemic continue to linger, shaping policy decisions around the world. The pandemic has also underscored the importance of maintaining prudent policy frameworks to cushion unexpected shocks, while highlighting fragilities in the global financial system that could potentially threaten macro-financial stability in the future. A review of these factors helps to identify some of the immediate policy priorities at the national and international levels to preserve the stability of the global monetary and financial system against future shocks in this new macro environment of decades-high inflation.

The rest of the paper is structured as follows. Section II presents a brief overview of global financial market developments at the onset of the pandemic. Section III reviews the key monetary and financial policies deployed across economies in the immediate aftermath of the pandemic, and their impact on financial markets. Section IV discusses the role played by other potential factors—such as the strength of the banking sector, policy credibility, and external buffers—in maintaining global financial stability. Section V discusses some unintended consequences of monetary and financial policies highlighted by the pandemic crisis. Section VI concludes with a discussion of some of the key policy priorities for maintaining global financial stability.

## II. ON THE BRINK

Following the COVID-19 pandemic in March 2020, global financial conditions tightened at an unprecedented speed. The prices of risk assets fell precipitously, and market volatility spiked amidst increased macroeconomic uncertainty and expectations of widespread corporate defaults. Equity markets, for example, experienced the fastest drop in history with the S&P 500 index falling 34 percent from its mid-February peak in just over a month. By comparison, decline of a similar magnitude had occurred over about eight months during the global financial crisis (Figure 1a). Similarly, funding conditions deteriorated sharply in corporate bond markets, with spreads widening on high-yield bonds and leveraged loans, as well as on investment grade bonds (Figure 1b).

Severe strains also appeared in short-term funding markets, as prime money market funds (MMFs) sought to reduce their commercial paper holdings to build liquidity buffers in order to meet investor redemptions.<sup>2</sup> U.S. Treasury security markets, normally considered as a safe haven during times of market stress, also experienced a notable deterioration in liquidity as the bid-ask spread on U.S. Treasuries widened sharply and market depth declined to levels observed during the global financial crisis (Fleming and Ruela 2020).<sup>3</sup> The broad divestment of debt securities

---

<sup>1</sup> See, for example, Altavilla et al. (2020), Barajas et al. (2020), Cavallino & De Fiore (2020), Deghi et al. (2021), Mosser (2020), Rebucci, Hartley & Jiménez (2021), Sever et al. (2020), and Valencia et al. (2021) for an analysis of the impact of monetary and financial policies on corporate funding liquidity and general financial conditions in the aftermath of the COVID-19 crisis.

<sup>2</sup> See, for example, Eren, Schrimpf & Sushko (2020a), Cipriani and La Spada (2020), Avalos and Xia (2021) for an in-depth analysis of the March 2020 stress in U.S. and European prime MMFs and its implications for financial markets.

<sup>3</sup> He, Nagel & Song (2022) argue that the observed movements in U.S. Treasury yields and spreads in March 2020 were a consequence of selling pressure originating from large holders of Treasuries interacted with intermediation frictions, including regulatory constraints such as the supplementary leverage ratio (SLR) that limit both the direct holdings of Treasuries and reverse

(continued...)

into cash (dubbed as the “dash for cash”) overwhelmed traditional intermediation channels, leading to a breakdown in dealer intermediation and severe asset price dislocations.

The dislocations in domestic U.S. dollar money markets reverberated globally as non-U.S. banks are particularly dependent on U.S. MMFs for financing of dollar assets (Eren, Schrimpf & Sushko 2020b). As prime MMFs withdrew funding of these banks in the face of large outflow pressures, conditions in offshore U.S. dollar funding markets tightened as well, adversely affecting non-U.S. banks and generating financial stress in other economies (Barajas et al. 2020).

Concurrently, oil prices collapsed in the face of weakening global demand and a lack of agreement among the oil producing countries on output cuts to stabilize oil prices, further intensifying stress in global financial markets.

Amid this turmoil, capital flows—particularly portfolio flows—generally reversed sharply from EMDEs, putting pressure on their external finances (Figure 2a). This contributed to a depreciation of domestic currencies and other asset values and led to a sharp tightening of domestic financial conditions (Figure 2b), particularly in more vulnerable EMDEs (Ahmed et al. 2020; OECD 2021; Scott and Zlate 2022).

It is worth noting that this massive disruption in global financial markets occurred against a backdrop of historically elevated levels of corporate sector leverage and stretched asset valuations across countries, which likely amplified the stress. On the back of highly accommodative monetary policies pursued by major central banks since the global financial crisis, financial conditions had remained easy through much of the last decade and nonfinancial corporate sector debt had increased steadily to about 90 percent of GDP at end-2019 (Barajas et al. 2021).<sup>4</sup> This increase was accompanied by weaker credit quality of borrowers, looser underwriting standards, and a significant expansion of risky credit market segments such as high yield bonds and leveraged loans (IMF 2020a). In equity markets, price-to-earnings ratio had increased prior to the COVID-19 crisis, and model-based evaluations pointed to overvalued equity prices in several countries, which likely contributed to the steep price declines observed in stock markets in March 2020.<sup>5</sup>

### III. SPECTACULAR REBOUND

In response to the financial market turmoil in March 2020, major central banks acted swiftly and decisively, cutting policy rates and introducing new asset purchase programs, liquidity support for the banking system, and several emergency facilities to sustain the flow of credit to the real economy. The size of these initiatives was unprecedented, and in just under three months since the beginning of the pandemic, the aggregate assets of these central banks had increased by about US\$6 trillion, more than double the increase seen during the two years following the global

---

repo positions of dealers. Schrimpf, Shin & Sushko (2020) note the role of levered investors and margin calls in amplifying the stress in U.S. Treasury market during the March 2020 turmoil.

<sup>4</sup> In addition to loose monetary policy, low interest rates in the run up to the pandemic also reflected low and declining natural rates of interest across advanced economies and some EMDEs owing to demographic change, weaker potential output growth, and higher precautionary savings in the aftermath of the global financial crisis.

<sup>5</sup> IMF (2019, 2020a) estimates a significant misalignment in both U.S equity prices and corporate credit spreads in the runup to the pandemic.



financial crisis (Figure 3a). Several emerging market central banks also deployed—for the first time—asset purchase programs to support monetary policy and market liquidity, buying a range of assets including government bonds, state-guaranteed bonds, corporate debt, and mortgage-backed securities (Figure 3b).

The barrage of monetary stimulus provided by central banks was supported by financial sector measures.<sup>6</sup> Many authorities temporarily eased some capital and liquidity requirements, imposed dividend distribution restrictions, and provided greater flexibility in the classification of exposures, including of non-performing and forbore loans, and in the regulatory treatment of accounting expected credit losses. Supervisors encouraged banks to prudently renegotiate loan terms of struggling borrowers and to use existing capital and liquidity buffers to stimulate lending.<sup>7</sup>

Following the massive and synchronized policy support, markets pared losses. Risk asset prices rebounded quickly, and benchmark interest rates decreased, leading to an overall easing of global financial conditions (Figure 4a). In the United States, for example, the turnaround in risk asset prices occurred around March 23, 2020, following the announcement by the U.S. Federal Reserve (Fed) of US\$2.3 trillion in credit facilities (Figure 4b). By mid-August, the S&P 500 index was trading at the pre-pandemic peak—the sharpest recovery on record after major stock market collapses (Figure 1a). A similar pattern was evident in most other major advanced economies and EMDEs, where equity markets recouped a large part of their initial losses, and credit markets experienced a significant tightening in spreads within months after the market turmoil. The lift to investor risk appetite facilitated corporate bond issuance and bank lending in most major economies.<sup>8</sup>

To address the acute strain in offshore U.S. dollar funding markets, the Fed augmented the provision of U.S. dollar liquidity in mid-March 2020 by enhancing existing swap lines with five central banks (Bank of Canada, Bank of England, Bank of Japan, European Central Bank, Swiss National Bank), and by establishing new temporary swap lines with nine others (Australia, Brazil, Denmark, Korea, Mexico, New Zealand, Norway, Singapore, Sweden). These swap lines had a significant impact, and their announcements were associated with a notable narrowing of

---

<sup>6</sup> The central bank and financial policy actions worked in tandem with fiscal measures that also played a key role in supporting investor sentiment. In the three months following the onset of the pandemic, governments around the world had provided large emergency lifelines to households and nonfinancial corporates amounting to nearly US\$ 11 trillion (IMF 2020b). Such measures helped to stimulate economic activity, boost confidence, and reduce unemployment (Deb et al. 2021) and strengthened the effectiveness of monetary and financial sector policies.

<sup>7</sup> Awad & others (2020), Svoronos & Vrbaski (2020), Kongsamut, Monaghan & Riedweg (2021), and Casanova, Hardy & Onen (2021) provide a detailed discussion of the banking sector measures introduced during the peak of the COVID-19 pandemic to support bank lending.

<sup>8</sup> Rebucci et al. (2021) find that asset purchase programs implemented in response to the COVID-19 pandemic crisis in both advanced and emerging market economies had a significant impact on long-term sovereign bond yields. In addition, they find that the policy actions by the U.S. Federal Reserve played a critical role in stabilizing global bond markets and addressing the global dollar shortage triggered by the COVID-19 outbreak. Similarly, focusing on emerging markets, Sever et al. (2020) find that central bank asset purchase announcements lowered long-term sovereign bond yields, while Deghi et al. (2021) document that policy interventions in G7 economies, especially those directly targeting the corporate sector, had a beneficial effect on credit supply conditions.

the cross-currency basis for swap line currencies (Barajas et al. 2020; Eren, Schrimpf & Sushko 2020).<sup>9</sup>

As global investor risk appetite improved, portfolio flows toward EMDEs resumed in the second quarter of 2020 and surged to pre-pandemic levels by end-2020 (Figure 2a). Notably, however, there was some differentiation across countries, with investment flowing into economies with relatively stronger macroeconomic fundamentals, while most countries with weak growth prospects and lower sovereign credit ratings continued to face external financing pressures (Figure 5).

#### IV. SUPPORTING FACTORS

The unprecedented and swift policy response of central banks thwarted the threat of a financial crisis, but their efforts were also supported by the strong monetary and financial frameworks in place before the pandemic. In this regard, three factors appear to have played a key role: the soundness of domestic banking sectors, policy credibility, and external buffers.

Banks entered the COVID-19 crisis with much higher capital and liquidity buffers than on the eve of the global financial crisis, owing to regulatory reforms implemented in the aftermath of the global financial crisis. For example, banks' Tier 1 capital ratio for advanced economies had almost doubled in 2019 to about 18 percent from 10 percent in 2007, while for EMDEs, it had improved from about 15 percent in 2007 to 16 percent in 2019 (Figure 6). The stronger buffers allowed banks to remain resilient through the pandemic and maintain credit provision to the real economy, thereby preventing the occurrence of a macro-financial doom loop (Abboud et al. 2021).<sup>10</sup>

Major central banks, both in advanced and emerging market economies, could act as lenders of last resort and preserve stability due to credibility earned over the years. Transparency, clear communications, and forward guidance provided direction to markets and helped restore confidence. The importance of credibility becomes apparent when looking across emerging markets, where central banks with a pre-pandemic track record of meeting their inflation targets could experiment with unconventional monetary policy tools and provide prolonged monetary policy support (Figure 7).<sup>11</sup> By contrast, economies in which central banks lacked such credibility (for example, Turkey) had to reverse course after initially easing monetary policy in order to stem capital outflows and rein in inflation expectations.<sup>12</sup>

Finally, emerging markets held sizeable external buffers in the form of foreign exchange reserves in the runup to the pandemic that were in most cases higher than their stock of reserves on the

---

<sup>9</sup> The cross-currency basis is a measure of tightness of offshore U.S. dollar funding conditions. It is defined as the difference between the direct cost of funding in U.S. dollar wholesale markets and the cost of synthetic U.S. dollar funding—that is, funding in another currency and using foreign exchange derivatives to convert to U.S. dollars. When direct U.S. dollar funding conditions tighten, demand for synthetic dollar funding increases, widening the cross-currency basis (Barajas et al. 2020).

<sup>10</sup> While banks maintained lending activity, several studies note their general reluctance to use capital and liquidity buffers to meet credit demand, highlighting the need to better understand the factors that influence banks use of buffers (BCBS 2021; Abboud et al. 2021; Abad and Pascual, 2022).

<sup>11</sup> The synchronized monetary policy easing in advanced economies also helped emerging markets to pursue accommodative monetary policies.

<sup>12</sup> In Turkey, the central bank lowered the policy rate in the first and second quarters of 2020 by a cumulative 375 basis points but raised it again by a cumulative 875 basis points by end-2020.

eve of the global financial crisis (Figure 8a). Though exchange rate flexibility helped to cushion the impact of the shock, a sufficient stock of foreign exchange reserves permitted intervention in foreign exchange markets to limit sharp currency depreciations in the face of large capital outflows and helped to dampen financial stability risks that can arise from unhedged foreign currency exposures (Figures 8b and 8c).<sup>13</sup> Taken together, these factors reinforced the impact of supportive macro-financial policies during the pandemic and helped to prevent the worst of financial outcomes across countries.

## V. UNINTENDED CONSEQUENCES

While the pandemic crisis has underscored the importance of policies in preventing calamitous financial outcomes, it has also brought to the fore some unintended consequences of policy actions—in particular of providing prolonged monetary policy support and applying regulation to specific segments of the financial system rather than taking a broader approach—that could undermine financial stability in the future.

### **Intertemporal trade-off**

Monetary easing and large-scale liquidity provision by central banks—while essential to ease financial market dysfunction—boosted investor risk appetite aggressively, resulting in asset price misalignments and increased nonfinancial sector leverage.<sup>14</sup> In the U.S., for example, the equity market rally that started immediately after the Fed’s announcement to establish corporate credit facilities on March 23, 2020, continued relentlessly until the end of 2021 with the S&P 500 index rising by over 100 percent during this period (Figure 4b). The surge in stock prices halted only after the Fed announced speeding up the tapering of its asset purchases in December 2021 and brought forward the plan to hike policy rates amid persistently high inflation. The exuberance on the part of equity investors during the pandemic has not been in line with macroeconomic fundamentals, creating a misalignment in equity prices of magnitudes comparable to the dotcom bubble in the 1990s (Figure 9a).

In corporate credit markets also, spreads remained low through most of 2020 and 2021 and bond issuance soared, contributing to a further buildup of nonfinancial corporate sector debt (Figure 9b). Vulnerabilities have also increased in the housing sector as prices have surged globally amid low mortgage rates and high demand (Figure 9c), resulting in overheated housing markets in several economies (IMF 2021b).<sup>15</sup>

---

<sup>13</sup> Looking at the flow of foreign exchange reserves in the first quarter of 2020, a similar picture is obtained as Figure 8c, with a larger decline in reserves associated with smaller currency depreciations. Further analysis also shows a higher stock of foreign exchange reserves in 2019 associated with greater foreign exchange intervention (a larger decline in reserves) during the pandemic.

<sup>14</sup> See Borio & Zhu (2012) and Adrian & Liang (2018) for possible channels through which loose monetary policy can increase financial vulnerabilities. Hanson et al. (2020) point out potential moral hazard problems associated with government support where the private sector may take increased risk, leading to an increase in vulnerabilities, believing that such support will be available in the future.

<sup>15</sup> By reducing longer-term interest rates, accommodative monetary policies have also helped to keep the cost of government borrowing low, thereby contributing to a rise in public debt (while supporting debt sustainability). In cases where a large part of the increase in public debt has been financed by the domestic financial sector, this has deepened the sovereign-financial sector nexus that could pose another financial stability risk should sovereign risk increase amid a tightening of global financial conditions (IMF 2022a).

The high level of vulnerabilities across different sectors poses a financial-stability risk, as it could potentially interact with and amplify the impact of an adverse macro-financial shock by triggering large asset price corrections and borrower defaults (Adrian et al 2019).<sup>16</sup> In fact, as mentioned earlier, the severe market turmoil observed at the beginning of the pandemic could also at least partly be attributed to the high level of financial vulnerabilities prevailing at that point—an outcome of accommodative monetary policies and easy financial conditions since the global financial crisis—that in turn required large-scale interventions by central banks to prevent a systemic financial crisis. Indeed, several studies have formally shown that a period of easy financial conditions tends to be accompanied by a buildup of financial vulnerabilities and is generally followed by output declines in the medium term (Barajas et al. 2021; Adrian et al. 2022). Monetary authorities, thus, face a fundamental trade-off between providing policy support to boost economic growth in the near-term and ensuring macro-financial resilience in the longer-term.

### **Inflation**

An unexpected outcome of the pandemic has been high and persistent inflation. At the onset of the pandemic, as economic activity declined and unemployment soared amid stringent public measures to contain the spread of the virus, inflation fell across both advanced economies and EMDEs (Figures 10a and 10b). However, on the back of greater vaccine adoption, as economies started to open up in early 2021 and economic activity gained momentum, inflationary pressures quickly built up and by the second half of the year, inflation was significantly above target for most central banks.

Several factors have been attributed to the rapid and persistent rise in inflation including the large fiscal stimulus rolled out by governments during the pandemic to cushion the impact of the shock, pent up consumer demand, tight labor markets, supply chain disruptions, easy financial conditions, and high energy prices, particularly in the aftermath of Russia's invasion of Ukraine (Amiti et al. 2022; Cavallo 2021; Celasun et al. 2022; Cochrane 2022; de Soyres, Santacreu & Young 2022). Nevertheless, it is the role of central banks and monetary policy in steering inflation that has perhaps received the most attention in policy debates.<sup>17</sup>

Confronted with rising inflation, central banks in emerging markets generally started to raise policy rates in the first half of 2021 to prevent a de-anchoring of inflationary expectations. By contrast, initially perceiving the inflationary pressures as transitory and wary of hurting the nascent economic recovery, central banks in major advanced economies pursued a dovish stance through 2021 (Figures 10c and 10d).<sup>18</sup> In the U.S., for example, inflationary pressures had emerged in early 2021, and the year-on-year inflation rate was close to 5 percent in the second quarter of 2021, but the Fed continued with its asset purchase program and maintained the near-zero policy rate, signaling no intention to tighten monetary policy through most of the year. Its

---

<sup>16</sup> High corporate sector debt poses not only a financial stability risk but could also be a drag on economic growth due to the debt overhang problem (Blickle & Santos 2020, Jorda et al 2022).

<sup>17</sup> See, for example, Bullard (2022); Bordo & Levy (2022), El-Erian (2022); Furman (2022); Summers (2022).

<sup>18</sup> See, for example, Powell (2021).

stance shifted in December 2021, as yearly inflation approached 7 percent—the highest level in the last forty years.

Other major advanced economy central banks such as Canada and the United Kingdom also did not react to rising inflationary pressures until the end of 2021, while the European Central Bank (ECB) raised its policy rate in July 2022. However, even though most central banks have shifted gears, inflationary pressures remain unabated so far and short- to medium-term inflation expectations remain well above central banks' targets (Figure 11, panels a and b). Amid tight labor markets, wage growth has also picked up to above pre-pandemic levels raising concerns of a wage-price spiral (Crump et al. 2022, Domash & Summers 2022). Central banks have thus come under increased public scrutiny for acting too late, thereby worsening the inflation-output tradeoff they face (Figure 11, panels c and d).

Looking back, it is apparent that both major central banks and professional forecasters significantly underestimated the strength of aggregate demand and its contribution to inflationary pressures, and expected supply chain and labor market disruptions caused by the pandemic to be short-lived. The past several decades of stable inflation, often below target, gave advanced-economy central banks the confidence that inflation would not become self-perpetuating, hence they were inclined to look through it. The reality however has shaken that confidence, as inflation has become broad-based and persistent, exacerbated by the shock to energy prices from Russia's invasion of Ukraine.

The low inflation rate over the past decade was also a key reason for the Fed and the ECB to revise their monetary policy frameworks during the pandemic to make up for past target misses of inflation by allowing for some overheating of the economy (Powell 2020; ECB 2021; Clarida 2022). The Fed, for example, adopted a flexible average inflation targeting strategy in August 2020 under which it aims to hit the inflation target of 2 percent on average over time to anchor long-term inflation expectations toward the target. What this implies is that following periods of inflation remaining persistently below 2 percent, the Fed will allow inflation to stay above the 2 percent target for some time.<sup>19</sup> In the accompanying forward guidance, the Fed also indicated that it would maintain the federal funds rate at near-zero levels until labor market conditions had reached levels consistent with its assessments of maximum employment and inflation had risen to 2 percent, and was on track to moderately exceed 2 percent for some time—thereby putting emphasis on both inflation and maximum employment.

In the case of the ECB, its revised monetary policy framework—adopted in July 2021—defines its inflation objective to be 2 percent over the medium term (in contrast to the “below, but close

---

<sup>19</sup> Specifically, the Fed's 2020 Statement on Longer-Run Goals and Monetary Policy Strategy notes that “In order to anchor longer-term inflation expectations at this level, the Committee seeks to achieve inflation that averages 2 percent over time, and therefore judges that, following periods when inflation has been running persistently below 2 percent, appropriate monetary policy will likely aim to achieve inflation moderately above 2 percent for some time.” The updated Fed strategy also suggests that monetary policy will react to “shortfalls” of employment from its maximum sustainable level, rather than deviations as was the case in the earlier framework, to make employment more broad-based and inclusive. With this change, the Fed will react to high unemployment but not to particularly low unemployment unless inflation is threatening the economy.

to 2 percent over the medium term,” Trichet 2003), which allows for transitory periods of inflation to be moderately above target.<sup>20</sup>

The experience of the pandemic suggests that not reacting to broad-based and persistent inflationary pressures when uncertainty around the source of the shocks is high or when the economy is overheating may entail significant risks in the form of inflation becoming entrenched (Gopinath 2022).<sup>21</sup> To tackle such a scenario, central banks may need to tighten monetary policy aggressively, which—as history has repeatedly shown—could engender another recession and impose high economic costs (Bordo & Levy, 2022), thereby outweighing the potential near-term employment and output benefits of keeping interest rates low for long.<sup>22</sup>

### Cross-border spillovers

The sudden stop and rebound in capital flows to EMDEs in the early phases of the pandemic has reminded us once again of the fickle nature of these flows. Prolonged periods of accommodative monetary policies in major advanced economies, while necessary to meet the domestic inflation and output objectives of central banks, encourage excessive capital flows, particularly of a short-term nature, to EMDEs as investors seek higher returns. In turn, these flows tend to create financial fragilities in the recipient countries through a rapid increase in nonfinancial sector leverage, currency appreciation, and an increase in asset prices.<sup>23</sup> A shift in advanced economies’ monetary policy stance, or a change in investor risk sentiment, could then turn the tide abruptly, leading to severe financial distress in recipient economies.<sup>24</sup>

The normalization of monetary policy by advanced-economy central banks amid persistent inflationary pressures has raised concerns of such a scenario panning out in vulnerable EMDEs. Since the end of 2021, when the Fed announced an acceleration in its pace of monetary policy normalization, portfolio flows have reversed sharply from EMDEs, cumulatively dwarfing the outflows observed during the peak of the global financial crisis as well as at the onset of the pandemic (Figure 2a). Correspondingly, yields on local currency bonds and sovereign bond term premiums have increased sharply, particularly for EMDEs with weaker macroeconomic

---

<sup>20</sup> The key difference between the approach of the Fed and ECB is that while the former will explicitly aim to overshoot its inflation target to make up for past shortfalls to achieve average inflation of 2 percent over time, the latter will tolerate periods of temporary overshoot from the 2 percent inflation target, but not aim for them outright (Wessel & Milstein 2022).

<sup>21</sup> Gopinath (2022) notes that the upside risks to inflation from running an overheated economy may be considerably higher than previously thought because of difficulties in accurately measuring economic slack, as well as the likelihood of shocks to cause overheating at the sectoral level because of capacity constraints which may translate into cost pressures in other connected sectors. Inflation may also rise quickly in an overheating economy as supply curves are less elastic in the short term; hence, a strong increase in aggregate demand could induce intense price pressures more easily.

<sup>22</sup> Schnabel (2022) argues that the economic cost of bringing down inflation in terms of lost employment and output (that is, the sacrifice ratio) may be higher today than in earlier years because of lower interest rate sensitivity of inflation (partly owing to a greater presence of intangible-capital intensive firms that tend to save more, as well as a structural shift toward the services sector), a flatter Philips curve (which implies that lowering persistent inflation potentially requires a deeper contraction), and the greater importance of global economic conditions for domestic inflation.

<sup>23</sup> A vast body of literature has examined the spillover effects of monetary policies in advanced economies to EMDEs, particularly in the U.S., and global financial conditions on cross-border capital flows and domestic financial conditions in emerging markets. See, for example, Ghosh et al. (2014), Bruno & Shin (2015), Rey (2015), Ghosh, Ostry & Qureshi (2017), di Giovanni et al. (2017), Avdjiev (2018), Obstfeld, Ostry & Qureshi (2019), and Bräuning & Ivashina (2020).

<sup>24</sup> For example, Ghosh, Ostry & Qureshi (2016) find that changes in global financial conditions have an important bearing on the crisis susceptibility of emerging markets after capital inflow surges. Countries that allow a buildup of macroeconomic and financial vulnerabilities during capital inflow surges, and which receive mostly debt flows, are significantly more likely to see surge episodes end in a financial crisis.

fundamentals, and domestic financial conditions have tightened considerably (IMF 2022b).<sup>25</sup> A sudden repricing of risk as advanced economies continue to normalize monetary policy could encourage further capital outflows from EMDEs and put additional strain on their economies.

The repeated boom-bust cycles in capital flows triggered by the ultra-loose monetary policies in advanced economies thus reflects another unintended consequence of such policies that undermines financial stability in EMDEs and could have important ramifications for the stability of the global monetary and financial system.<sup>26</sup>

### **Risk migration**

The pandemic crisis has tested the global regulatory framework and shown that financial reforms adopted after the global financial crisis have indeed strengthened domestic banking systems. At the same time, however, intermediation by the nonbank financial sector has increased dramatically over the past decade, as some banking activities—and their inherent risks—have migrated from banks to nonbanks, partly owing to the increased regulation of the former (IMF 2015, 2022b).

The unfolding of the financial market turmoil in March 2020 has revealed the vulnerabilities associated with these NBFIs, in particular with some types of investment funds, and the potential role that they can play in amplifying market stress and threatening financial stability.<sup>27</sup> Open-ended mutual funds, for example, experienced intense withdrawals as uncertainty increased in March 2020. To cover redemptions, these funds predominantly shed liquid assets including U.S. Treasury securities but forced asset sales amplified price pressures and contributed to liquidity falling across fixed-income markets. The decline in market liquidity, in turn, led investors to become even more sensitive to funds' portfolio performance and encouraged further withdrawals, reinforcing the vicious cycle between redemptions and asset fire sales that subsided only after central banks announced their intention of large-scale asset purchases including of corporate bonds (Falato, Goldstein & Hortaçsu 2021).

The pandemic experience highlights the urgency to address the vulnerabilities associated with NBFIs by extending the regulatory perimeter to cover such institutions, but more broadly it underscores the need for the global regulatory framework to evolve along with the structural changes occurring in financial systems to preserve macro-financial stability.<sup>28</sup>

---

<sup>25</sup> Part of the increase in yields and tightening of domestic financial conditions may reflect monetary policy normalization by EMDE central banks battling with inflationary pressures.

<sup>26</sup> Macro-financial instability in EMDEs could have significant implications for advanced economies through multiple channels including by imposing losses on their financial institutions, as well as by reducing demand for their imports (Ostry & Ghosh 2016; Ghosh, Ostry & Qureshi 2017; Obstfeld 2020; Agénor & da Silva 2022).

<sup>27</sup> Hespeler and Suntheim (2020) document that open-ended mutual funds experienced a short period of intense withdrawals during the March 2020 market stress episode. To cover redemptions, afflicted funds predominantly shed liquid assets including US Treasury securities but forced asset sales amplified price pressures and contributed to liquidity falling across fixed-income markets. This drop in market liquidity, as well as the general stress in financial markets, led to fund investors becoming even more sensitive to challenging portfolio performance and encouraged further withdrawals. The liquidity and redemption stress subsided only after central banks intervened and supported asset managers directly and indirectly.

<sup>28</sup> During the pandemic, for example, there has been a phenomenal growth in decentralized finance (or “DeFi”), which is a form of financial intermediation based on crypto assets. While such innovation potentially offers efficiency and inclusion advantages, unregulated DeFi poses market, liquidity, and cyber risks—calling for an urgent and effective regulatory approach to mitigate such risks (IMF 2022a).

## VI. SUSTAINING GLOBAL FINANCIAL STABILITY: KEY LESSONS AND FUTURE PRIORITIES

The COVID-19 pandemic has put the global economic and financial system under severe strain and continues to pose a challenge as its effects linger, most notably in the form of persistent supply chain disruptions and shifts in labor markets, creating uncertainty and complicating policy making. The Russian invasion of Ukraine and resulting disruptions in energy and commodity markets have further added to macroeconomic uncertainty and amplified the difficulties faced by policymakers. The experience thus far of navigating its many challenges offers some important insights and policy lessons to preserve macro-financial stability going forward in this new high-inflation macroeconomic environment.

In particular, the crisis has highlighted the importance of swift and adequate monetary policy support by central banks to restore confidence and stabilize markets in the face of extreme macro-financial shocks. The role of central banks as a lender of last resort has further evolved in this crisis, with major central banks providing liquidity to the non-bank private sector, and in several emerging market economies, intervening for the first time in markets to purchase assets in order to ease liquidity strains and preserve financial stability. Increased flexibility of financial sector policy measures was necessary and helped to ensure that banks continued to lend to the real economy through the crisis, preventing an adverse macro-financial feedback loop.

The effectiveness of the policy actions taken by monetary and financial authorities was supported by the strong monetary and financial frameworks in place such as sound domestic banking systems, policy credibility, and for emerging markets, adequate external buffers to cushion adverse shocks.

The pandemic crisis has, however, also reinforced some unintended consequences of prolonged monetary policy support. A loose monetary policy stance to ease financial conditions may be necessary to stimulate economic growth in the near-term but could lead to a buildup of financial vulnerabilities, threatening macro-financial stability down the road. Waiting to normalize monetary policy as broad-based and persistent inflationary pressures emerge, especially amid high uncertainty on the nature of inflation shocks and overheating economies, poses the risk of inflation becoming entrenched and inflation expectations de-anchoring, eventually requiring an aggressive policy response down the road that could be much more costly relative to tightening gradually early on.

Loose monetary policies in advanced economies may also have adverse cross-border spillover effects, leading to greater capital flow volatility in EMDEs that could potentially threaten the stability of the international monetary and financial system.

The crisis has also shown that while global regulatory reforms adopted after the global financial crisis have made banking systems generally safer, they have led to a migration of risk to other parts of the financial sector. Thus, important vulnerabilities have emerged in nonbank financial intermediation that require further regulatory reform.

Against this experience, we see four key priority areas to further strengthen resilience of the global financial system:



- *Mitigating the intertemporal policy trade-offs.* In an environment where accommodative monetary policies are needed to support economic growth, monetary and financial authorities need to proactively monitor financial vulnerabilities and risk taking, and they should develop and deploy adequate macroprudential tools that apply to both banks and nonbank financial institutions to preserve financial stability.

- *Ensuring robust monetary policy frameworks.* Central banks must be resolute in tackling inflationary pressures and preserve their hard-won credibility by maintaining price stability and ensuring that their monetary policy frameworks are robust to both downside and upside risks to inflation. While central banks in major economies had been battling deflationary pressures over the last decade or so, possible structural shifts induced by the pandemic to supply chains and labor markets, as well as other global factors such as a retreat from globalization among geopolitical tensions and energy shocks have made the recovery from the pandemic highly inflationary. As some of these factors may continue to pose inflationary headwinds in the medium term, central banks need to reflect on their monetary policy strategies to assess when to react to persistent supply-side shocks and the conditions under which it is suitable to allow economies to overheat. As history has shown, not reacting to persistent inflationary pressures amid high uncertainty around the nature of shocks may entail significant risks and a more costly inflation-output intertemporal trade off.<sup>29</sup>

- *Managing capital flow volatility.* To mitigate the spillover effects from monetary policies pursued by advanced economies, EMDEs need to manage capital flow volatility through the use of macroeconomic and prudential policies as well as foreign exchange intervention and capital controls, as appropriate (IMF 2022c). Maintaining strong macroeconomic policy frameworks and external buffers in normal times is critical to build the space to respond to adverse shocks. Furthermore, given the increasing size of cross-border capital flows, the crisis has also underscored the need for multilateral cooperation to strengthen the global financial safety net including through an expansion of bilateral swap lines and regional financing arrangements to alleviate foreign currency funding pressures in times of stress.

- *Addressing systemic risks in nonbank financial intermediation.* Given the growing importance of nonbank financial intermediation, in particular by open-ended investment funds holding illiquid assets, in core financial markets such as sovereign and corporate bonds, it is imperative that the systemic risks posed by these institutions are better understood and addressed. In the case of investment funds, for example, implementation of appropriate liquidity management tools is of utmost importance to reduce the risks inherent in their maturity and liquidity transformation (IMF 2021c, 2022b). Furthermore, the regulation and supervision of the sector need to be strengthened and made commensurate with the financial stability risks it poses.

---

<sup>29</sup> Monetary policy must also be coordinated with fiscal policy to make the inflation-output trade-off less binding. For instance, Bianchi and Melosi (2022) show that low and stable inflation requires an appropriate fiscal framework aimed at stabilizing government debt, and mutually consistent monetary and fiscal policies to avoid stagflation. Cochrane (2022) also notes the importance of coordinated fiscal and monetary policies to reduce inflation without a major recession. In the presence of significant supply-side factors driving inflation, Carstens (2022) notes the limits of demand-side policies and calls for a more balanced approach that addresses aggregate supply issues.

Figure 1. Asset Market Performance during the COVID-19 Pandemic

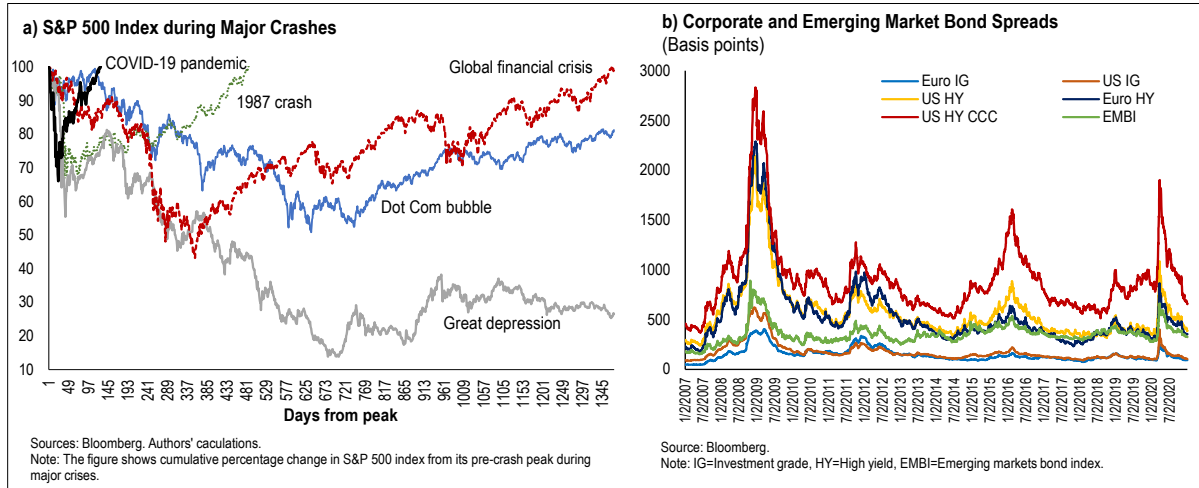


Figure 2. Portfolio Flows and Financial Conditions in Emerging Market and Developing Economies

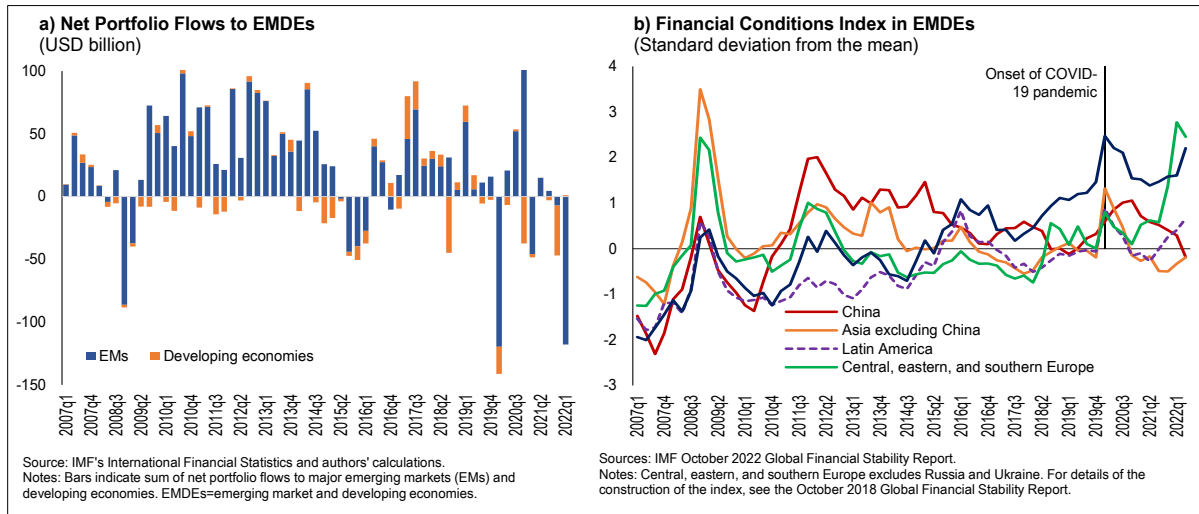


Figure 3. Central Bank Asset Purchases during COVID-19 Pandemic

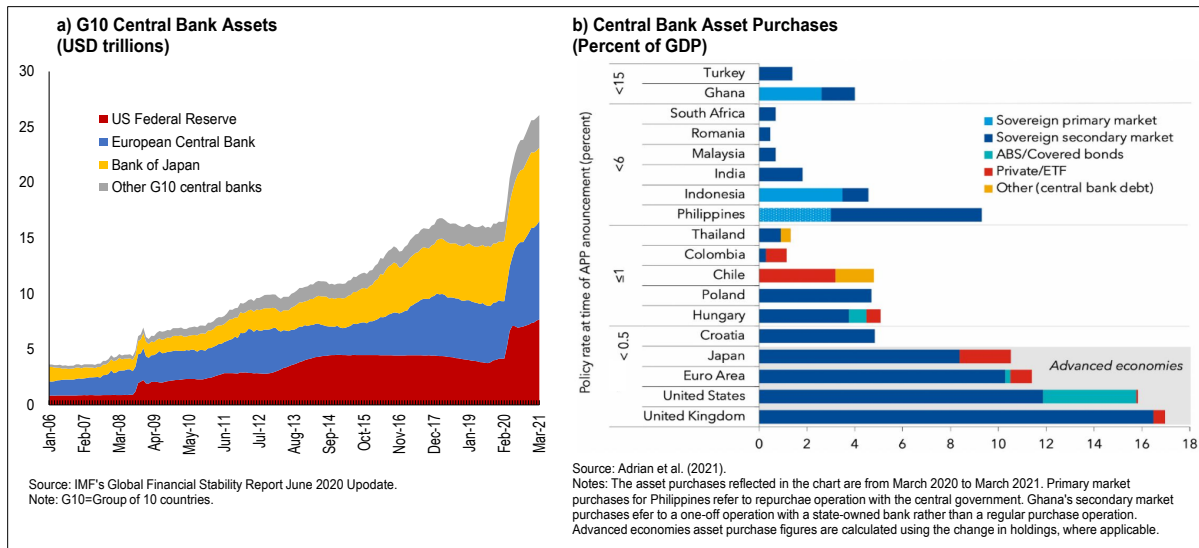


Figure 4. Central Bank Policy Interventions and Rebound in Asset Prices

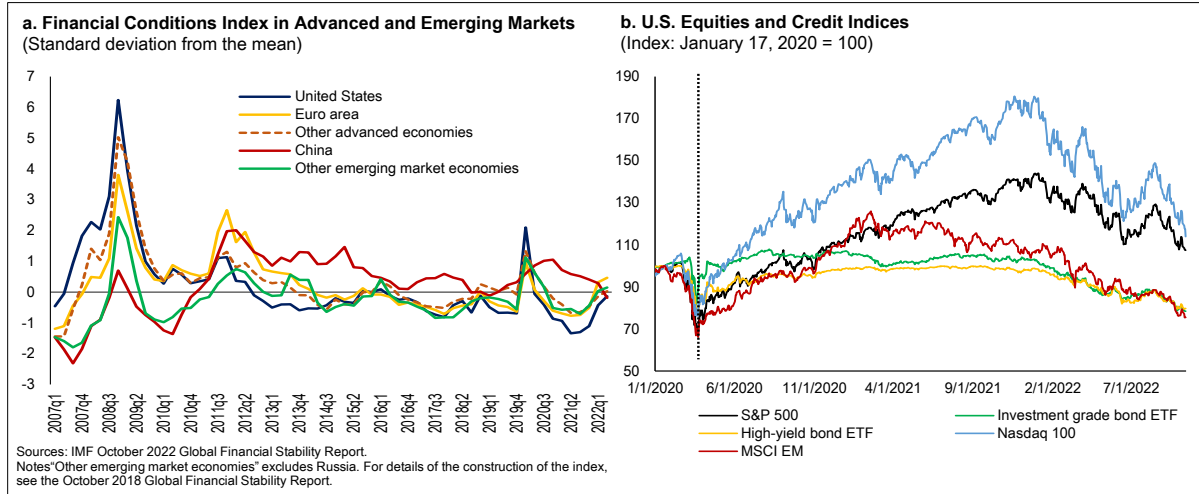


Figure 5. EMDE Portfolio Flows and Sovereign Credit Spreads

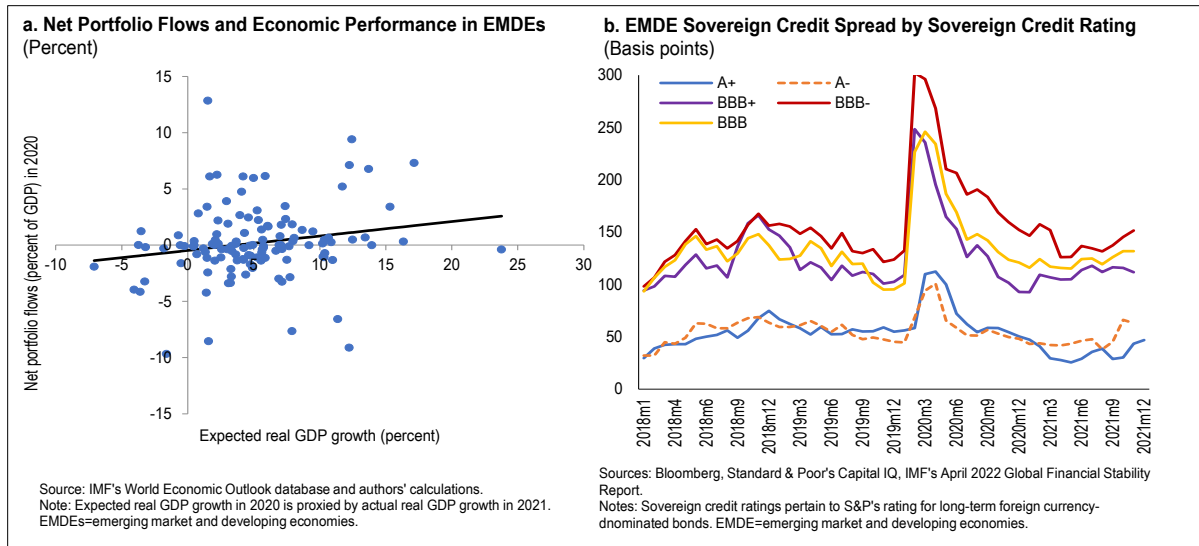
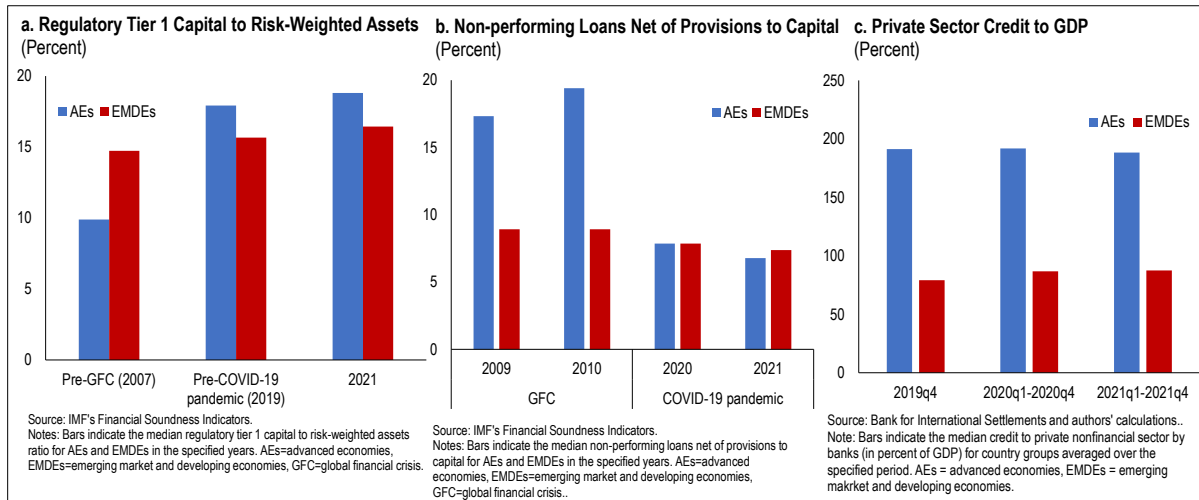
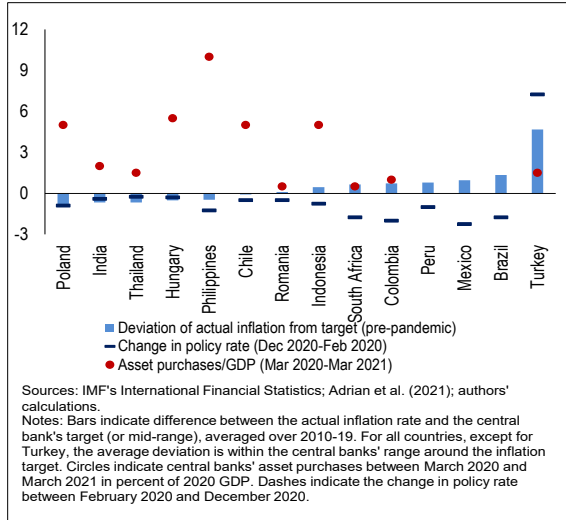


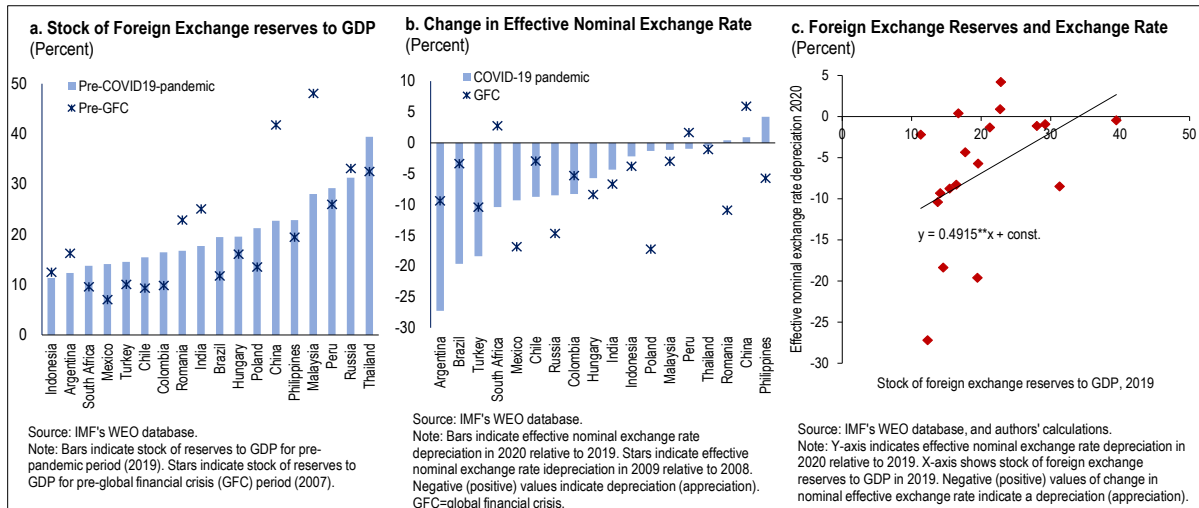
Figure 6. Banking Sector Soundness in Advanced Economies and EMDEs



**Figure 7. Policy Credibility and Monetary Policy Response during the COVID-19 Pandemic (Percent)**



**Figure 8. External Buffers and Currency Depreciation in Emerging Markets during the COVID-19 Pandemic**



**Figure 9. Financial Vulnerabilities during the COVID-19 Pandemic**

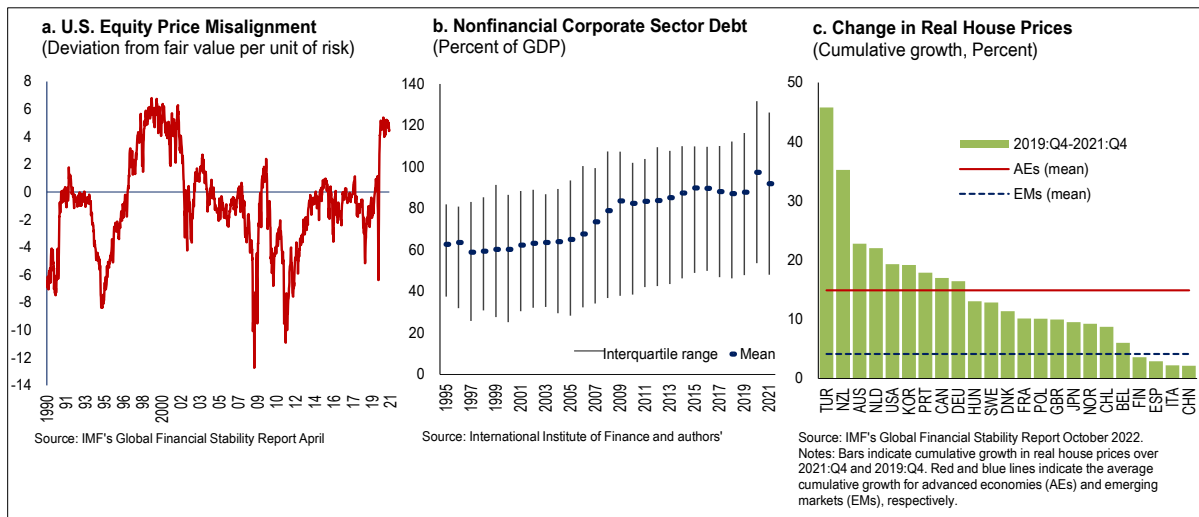


Figure 10. Inflation and Policy Rate during the COVID-19 Pandemic

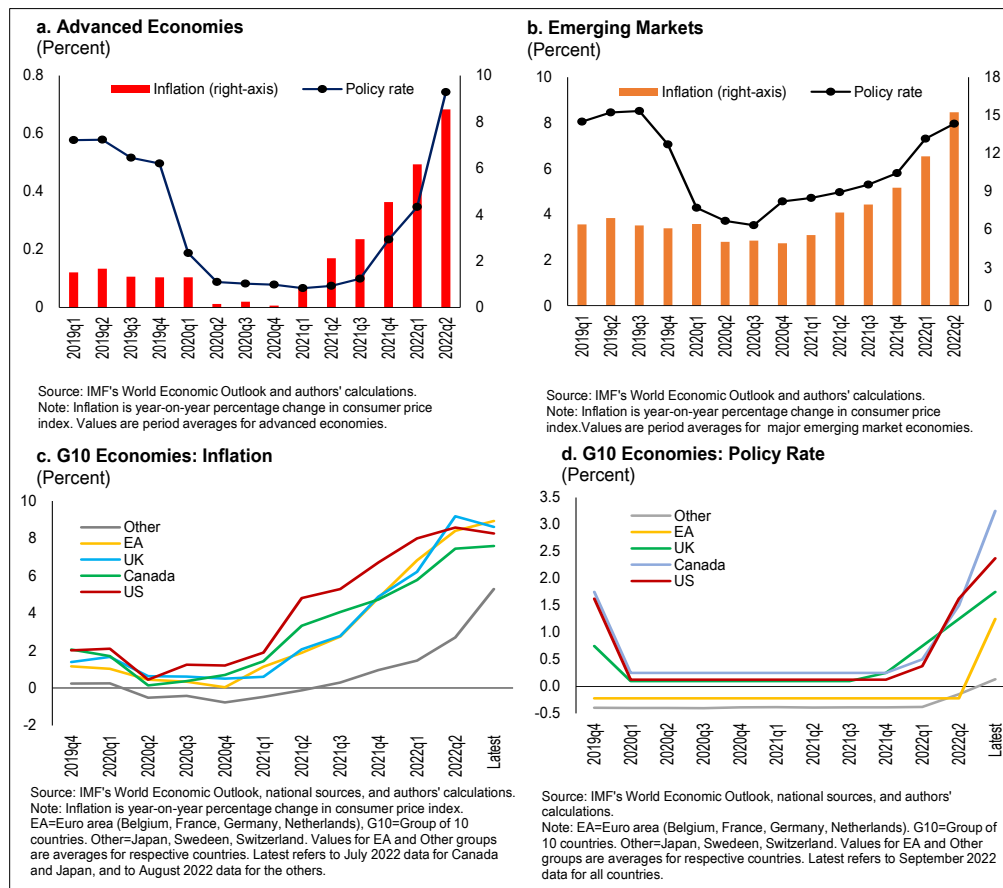
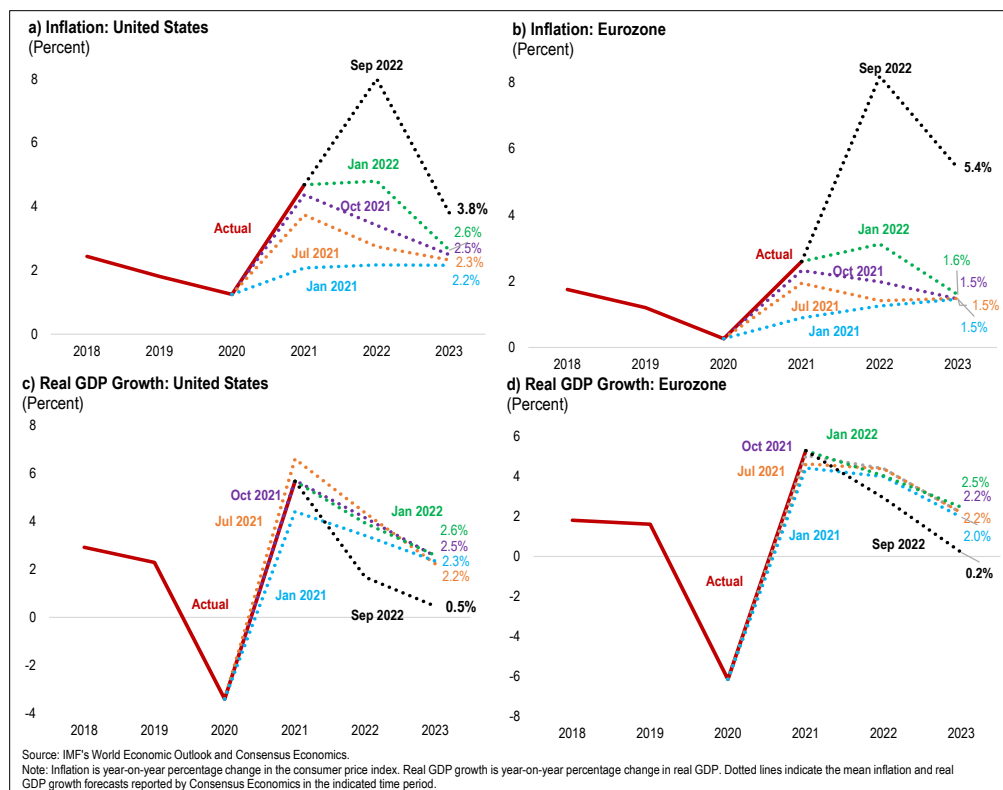


Figure 11. Actual and Projected Inflation and Real GDP Growth in the U.S. and Eurozone



## References

- Abad, José, and Antonio I. Garcia Pascual. 2022. “Usability of Bank Capital Buffers: The Role of Market Expectations.” IMF Working Paper 2022/021, International Monetary Fund, Washington, DC.
- Abboud, Alice, Elizabeth Duncan, Akos Horvath, Diana A. Iercosan, Bert Loudis, Francis Martinez, Timothy Mooney, Ben Ranish, Ke Wang, Missaka Warusawitharana, and Carlo Wix. 2021. “COVID-19 as a Stress Test: Assessing the Bank Regulatory Framework.” Finance and Economics Discussion Series 2021-024. Board of Governors of the Federal Reserve System, Washington D.C.
- Adrian, Tobias and Nellie Liang. 2018. “Monetary Policy, Financial Conditions, and Financial Stability.” *International Journal of Central Banking* 14(1): 73–131.
- Adrian, Tobias, Dong He, Nellie Liang, and Fabio Natalucci. 2019. “A Monitoring Framework for Global Financial Stability.” IMF Staff Discussion Note 2019/006, Washington DC.
- Adrian, Tobias, Chris Erceg, Simon Gray, and Ratna Sahay. 2021. “Asset Purchases and Direct Financing: Guiding Principles for Emerging Markets and Developing Economies during COVID-19 and Beyond.” Departmental Paper No 2021/023, International Monetary Fund, Washington DC.
- Adrian, Tobias, Federico Grinberg, Nellie Liang, Sheheryar Malik, and Jie Yu. 2022. “The Term Structure of Growth-at-Risk.” *American Economic Journal: Macroeconomics* 14(3): 283-323.
- Agénor, Pierre-Richard, and Luis A. Pereira da Silva. 2022. “Financial Spillovers, Spillbacks, and the Scope for International Macroprudential Policy Coordination.” *International Economics and Economic Policy* 19(1): 79-127.
- Ahmed, Shaghil, Jasper Hoek, Steve Kamin, Ben Smith, and Emre Yoldas. 2020. “The Impact of COVID-19 on Emerging Market Economies’.” Financial Conditions, FEDS Notes October 07, 2020, Board of Governors of the Federal Reserve System, Washington DC.
- Altavilla, Carlo, Francesca Barbiero, Miguel Boucinha, and Lorenzo Burlon. 2020. “The Great Lockdown: Pandemic Response Policies and Bank Lending Conditions.” Working Paper Series 2465, European Central Bank, Frankfurt.
- Amiti, Mary, Sebastian Heise, Fatih Karahan, and Aysegül Şahin. 2022. “Inflation Strikes Back: The Return of Wage to Price Pass-Through,” Paper presented at the *Advances in Monetary Economics Conference 2022*, International Monetary Fund, Washington DC.
- Avalos, Fernando, and Dora Xia. 2021. “Stress in European Money Market Funds at the Outbreak of the Pandemic.” BIS Quarterly Review September 2021, Bank for International Settlements, Basel.
- Avdjiev, Stefan, Cathérine Koch, Patrick McGuire, and Goetz Von Peter. 2018. “Transmission of Monetary Policy through Global Banks: Whose Policy Matters?” *Journal of International Money and Finance* 89: 67-82.
- Awad, Rachid, Caio Ferreira, Aldona Jociene, and Luc Riedweg. 2020. “Restriction of Banks’ Capital Distribution during the COVID-19 Pandemic (Dividends, Share Buybacks, and Bonuses).” Monetary and Capital Markets Department Special Series on COVID-19, International Monetary Fund, Washington DC.
- Barajas, Adolfo, Andrea Deghi, Samuel Fendoglu, and Yizhi Xu. 2020. “Strains in Offshore US Dollar Funding during the COVID-19 Crisis: Some Observations.” Global Financial Stability Notes 2020/01, International Monetary Fund, Washington DC.
- Barajas, Adolfo, Woon Gyu Choi, Pierre Guerin, Samuel Mann., and Yizhi Xu. 2021. “Loose Financial Conditions, Rising Leverage, and Risks to Macro-Financial Stability.” IMF Working Paper 2021/222, International Monetary Fund, Washington DC.
- BCBS. 2021. “Early Lessons from the Covid-19 Pandemic on the Basel Reforms.” Basel Committee on Banking Supervision, Bank for International Settlements, Basel.

- Bianchi, Francesco and Leonardo Melosi. 2022. “Inflation as a Fiscal Limit.” FRB of Chicago Working Paper 37, Federal Reserve Bank of Chicago, Chicago, IL.
- Blickle, Kristian, and João Santos. 2020. “The Costs of Corporate Debt Overhang Following the COVID-19 Outbreak.” Federal Reserve Bank of New York *Liberty Street Economics*, December 1. <https://libertystreeteconomics.newyorkfed.org/2020/12/the-costs-of-corporate-debt-overhang-following-the-covid-19-outbreak.html>.
- Bordo, Michael and Mickey Levy. 2022. “The Fed’s Monetary Policy Exit Once Again Behind the Curve.” Hoover Institution Economics Working Paper 22110, Hoover Institution, Washington DC.
- Borio, Claudio and Haibin Zhu. 2012. “Capital Regulation, Risk-Taking and Monetary Policy: A Missing Link in the Transmission Mechanism.” *Journal of Financial Stability* 8(4): 236–51.
- Bräuning, Falk and Victoria Ivashina. 2020. “U.S. Monetary Policy and Emerging Market Credit Cycles.” *Journal of Monetary Economics* 112: 57-76.
- Bruno, Valentina and Hyun Shin. 2015. “Capital Flows and the Risk-taking Channel of Monetary Policy.” *Journal of Monetary Economics* 71: 119 – 132.
- Bullard, James. 2022. “The U.S. Economy and Monetary Policy.” Speech at Princeton University, April 27. <https://www.stlouisfed.org/from-the-president/speeches-and-presentations/2022/is-the-fed-behind-the-curve>.
- Capelle-Blancard, Gunther and Adrien Desroziers. 2020. “The Stock Market is Not the Economy?” Insights from the COVID-19 Crisis.” *CEPR Covid Economics, Issue 28, Center for Economic Policy Research, London*.
- Carstens, Agustin. 2022. “A Story of Tailwinds and Headwinds: Aggregate Supply and Macroeconomic Stabilization.” Remarks made at the *Jackson Hole Economic Policy Symposium: Macroeconomic Policy in an Uneven Economy*. <https://www.bis.org/speeches/sp220826.htm>.
- Casanova, Catherine, Bryan Hardy, and Mert Onen. 2021. “Covid-19 Policy Measures to Support Bank Lending.” BIS Quarterly Review September 2021, Bank for International Settlements, Basel.
- Cavallino, Paolo, and Fiorella De Fiore. 2020. “Central Banks’ Response to Covid-19 in Advanced Economies.” BIS Bulletins 21, Bank for International Settlements, Basel.
- Cavallo, Alberto 20. “Inflation With Covid Consumption Baskets.” NBER working Paper 27352, National Bureau of Economic Research, Cambridge, MA.
- Celasun, Oya, Niels-Jakob Hansen, Aiko Mineshima, Mariano Spector, and Jing Zhou, 2022. “Supply Bottlenecks: Where, Why, How Much, and What Next.” IMF Working Paper 2022/31, International Monetary Fund, Washington DC.
- Cipriani, Marco and Gabriele La Spada. 2020. “Sophisticated and Unsophisticated Runs.” Federal Reserve Bank of New York Staff Reports 956, New York, New York.
- Clarida, Richard. 2022. “The Federal Reserve’s New Framework: Context and Consequences,” Finance and Economics Discussion Series 2022-001, Board of Governors of the Federal Reserve System, Washington, DC.
- Cochrane, John. 2022. “Inflation Past, Present and Future: Fiscal Shocks, Fed Response, and Fiscal Limits.” NBER Working Paper 30096, National Bureau of Economic Research, Cambridge, MA.
- Crump, Richard, Stefano Eusepi, Marc Giannoni, and Ayşegül Şahin. 2022. “The Unemployment-Inflation Trade-off Revisited: The Phillips Curve in COVID Times.” NBER Working Paper 29785, National Bureau of Economic Research, Cambridge, MA.

- de Soyres, Francois, Ana Maria Santacreu, and Henry Young. 2022. “Fiscal Policy and Excess Inflation during Covid-19: A Cross-Country View.” FEDS Notes, July 15, 2022, Board of Governors of the Federal Reserve System, Washington DC.
- Deb, Praygyan, Davide Furceri, Jonathan Ostry, Nour Tawk, and Naihan Yang. 2021. “The Effects of Fiscal Measures during COVID-19.” CEPR Discussion Paper 16726, Center for Economic Policy Research, London.
- Deghi, Andrea, Dulani Seneviratne, Tomohiro Tsuruga and Jerome Vandenbussche. 2021. “Corporate Funding and the COVID-19 Crisis.” IMF Working Paper 2021/086, International Monetary Fund, Washington DC.
- Di Giovanni, Julian, Sebnem Kalemli-Ozcan, Mehmet Fatih Ulu, and Yusuf Baskaya. 2017. “International Spillovers and Local Credit Cycles.” NBER Working Papers 23149, National Bureau of Economic Research, Cambridge, MA.
- Domash, Alex and Lawrence Summers. 2022. “How Tight are U.S. Labor Markets?” NBER Working Paper 29739, National Bureau of Economic Research, Cambridge, MA.
- ECB. 2021. “An Overview of The ECB’s Monetary Policy Strategy.” European Central Bank, Frankfurt. [https://www.ecb.europa.eu/home/search/review/html/ecb.strategyreview\\_monpol\\_strategy\\_overview.en.html](https://www.ecb.europa.eu/home/search/review/html/ecb.strategyreview_monpol_strategy_overview.en.html).
- El-Erian, Mohamed. 2022. “The Risk of a Flip-Flopping Fed.” Financial Times Opinion Markets Insight, June 29. Available at: <https://www.ft.com/content/23c3a3a7-b2da-412c-8050-bdad986fde21>.
- Eren, Egemen, Andreas Schrimpf, and Vladyslav Sushko. 2020a. “US Dollar Funding Markets during the Covid-19 Crisis—The Money Market Fund Turmoil.” BIS Bulletin 14, Bank for International Settlements, Basel.
- Eren, Egemen, Andreas Schrimpf, and Vladyslav Sushko. 2020b. “US Dollar Funding Markets during the Covid-19 Crisis—The International Dimension.” BIS Bulletin 15, Bank for International Settlements, Basel.
- Falato, Antonio, Itay Goldstein, and Ali Hortaçsu. 2021. “Financial Fragility in the COVID-19 Crisis: The Case of Investment Funds in Corporate Bond Markets.” *Journal of Monetary Economics* 123: 35–52.
- Fleming, Michael and Francisco Ruela. 2020. “Treasury Market Liquidity during the COVID-19 Crisis.” Federal Reserve Bank of New York *Liberty Street Economics*, April 17, 2020. <https://libertystreeteconomics.newyorkfed.org/2020/04/treasury-market-liquidity-during-the-covid-19-crisis.html>.
- Furman, Jason. 2022. “America’s Wage-Price Persistence Must Be Stopped, Big Picture Project Syndicate.” August 2. <https://www.project-syndicate.org/onpoint/curbing-the-inflation-virus>.
- Ghosh, Atish, Mahvash Qureshi, J. Kim, and J. Zalduendo. 2014. “Surges.” *Journal of International Economics* 92(2): 266-285.
- Ghosh, Atish, Jonathan Ostry, and Mahvash Qureshi. 2016. When Do Capital Inflow Surges End in Tears? *American Economic Review* 106(5): 581-585.
- Ghosh, Atish, Jonathan Ostry, and Mahvash Qureshi. 2017. “Taming the Tide of Capital Flows: A Policy Guide,” MIT Press, Cambridge, MA.
- Gopinath, Gita 2022. “How Will the Pandemic and War Shape Future Monetary Policy?” Remarks made at the *Jackson Hole Economic Policy Symposium: Macroeconomic Policy in an Uneven Economy*. [https://www.kansascityfed.org/Jackson%20Hole/documents/9090/Remarks\\_by\\_Gopinath.pdf](https://www.kansascityfed.org/Jackson%20Hole/documents/9090/Remarks_by_Gopinath.pdf).
- Hanson, Samuel, Jeremy Stein, Adi Sunderman, and Eric Zwick. 2020. “Business Credit Programs in the Pandemic Era. Brookings Papers on Economic Activity, 3: 3-60.



- He, Zhiguo, Stefan Nagel, and Zhaogang Song. 2022. “Treasury Inconvenience Yields during the COVID-19 Crisis.” *Journal of Financial Economics* 143 (1): 57-79.
- Hespeler, Frank and Felix Suntheim. 2020. “The Behavior of Fixed-income Funds during COVID-19 Market Turmoil.” Global Financial Stability Notes 2020/02, International Monetary Fund, Washington DC.
- International Monetary Fund. 2015. “Global Financial Stability Report April 2015: Navigating Monetary Policy Challenges and Managing Risks.” Washington DC.
- International Monetary Fund. 2019. “Global Financial Stability Report October 2019: Lower for Longer.” Washington DC.
- International Monetary Fund. 2020a. “Global Financial Stability Report April 2020: Markets in the Time of COVID-19.” Washington DC.
- International Monetary Fund. 2020b. “Global Financial Stability Update June 2020: Financial Conditions Have Eased, but Insolvencies Loom Large.” Washington DC.
- International Monetary Fund. 2021a. “Global Financial Stability Report April 2021: Preempting a Legacy of Vulnerabilities.” Washington DC
- International Monetary Fund. 2021b. “Global Financial Stability Report October 2021: COVID-19, Crypto and Climate: Navigating Challenging Transitions.” Washington DC.
- International Monetary Fund. 2021c. “Investment Funds and Financial Stability: Policy Considerations.” Monetary and Capital Markets Departmental Paper 2021/018.” Washington DC
- International Monetary Fund. 2022a. “Global Financial Stability Report April 2022: Shockwaves from the War in Ukraine Test the Financial System's Resilience.” Washington DC
- International Monetary Fund. 2022b. “Global Financial Stability Report October 2022: Navigating the High-Inflation Environment.” Washington DC.
- International Monetary Fund. 2022c. “Review of the Institutional View on the Liberalization and Management of Capital Flows.” IMF Policy Paper No. 2022/008, Washington DC.
- Jordà, Òscar, Martin Kornejew, Moritz Schularick, and Alan Taylor. 2022. “Zombies at Large? Corporate Debt Overhang and the Macroeconomy.” *The Review of Financial Studies*, 10: 4561-4586. <https://doi.org/10.1093/rfs/hhac018>.
- Kongsamut, Piyabha, Dermot Monaghan, and Luc Riedweg, 2021. “Unwinding COVID-19 Policy Interventions for Banking Systems.” Monetary and Capital Markets Department Special Series on COVID-19.” International Monetary Fund, Washington DC.
- Mosser, Patricia C. 2020. “Central Bank Responses to COVID-19.” *Business Economics* 55 (4): 191–201.
- Obstfeld, Maurice. 2020. “Global Dimensions of U.S. Monetary Policy.” *International Journal of Central Banking* 16(1): 73-132.
- Obstfeld, Maurice, Jonathan Ostry, and Mahvash Qureshi. 2019. “A Tie That Binds: Revisiting the Trilemma in Emerging Market Economies.” *The Review of Economics and Statistics* 101(2): 279-293.
- OECD. 2021. “Sovereign Borrowing Outlook 2021.” Organisation for Economic Cooperation and Development, Paris.
- Ostry, Jonathan, and Atish Ghosh. 2016. “On the Obstacles to International Policy Coordination.” *Journal of International Money and Finance* 67: 25-40.
- Powell, Jerome. 2020. “New Economic Challenges and the Fed’s Monetary Policy Review.” *Jackson Hole Economic Policy Symposium: Navigating the Decade Ahead: Implications for Monetary Policy*. <https://www.federalreserve.gov/newsevents/speech/powell20200827a.htm>.

- Powell, Jerome. 2021. “Opening Remarks: Monetary Policy in the Time of COVID.” *Jackson Hole Economic Policy Symposium: Macroeconomic Policy in an Uneven Economy*, August 27. [https://www.kansascityfed.org/Jackson%20Hole/documents/8752/Powell\\_JH21.pdf](https://www.kansascityfed.org/Jackson%20Hole/documents/8752/Powell_JH21.pdf)
- Rebucci, Alessandro, Jonathan Hartley, and Daniel Jiménez. 2020. “An Event Study of COVID-19 Central Bank Quantitative Easing in Advanced and Emerging Economies.” NBER Working Paper 27339. National Bureau of Economic Research, Cambridge, MA.
- Rey, H el ene. 2015. “Dilemma not Trilemma: The Global Financial Cycle and Monetary Policy Independence.” NBER Working Papers 21162, National Bureau of Economic Research, Cambridge, MA.
- Schnabel, Isabel. 2022. “Monetary Policy and the Great Volatility.” Remarks made at the *Jackson Hole Economic Policy Symposium: Macroeconomic Policy in an Uneven Economy*. <https://www.ecb.europa.eu/press/key/date/2022/html/ecb.sp220827~93f7d07535.en.html>
- Schrimpf, Andreas, Hyun Shin, and Vladyslav Sushko. 2020. “Leverage and Margin Spirals in Fixed Income Markets during the Covid 19 Crisis.” BIS Bulletin 2, Bank for International Settlements, Basel.
- Scott, Davis and Andrei Zlate. 2022. “The Global Financial Cycle and Capital Flows during the COVID-19 Pandemic.” Globalization Institute Working Paper 416, Federal Reserve Bank of Dallas, Dallas TX.
- Sever, Can, Rohit Goel, Dimitrios Drakopoulos, and Evan Papageorgiou. 2020. “Effects of Emerging Market Asset Purchase Program Announcements on Financial Markets During the COVID-19 Pandemic.” IMF Working Paper 2020/292, International Monetary Fund, Washington DC.
- Summers, Larry. 2022. “Inflation and the Fed’s Attempts to Cool the Economy.” *Kellogg Insight*, May 3. Available at <https://insight.kellogg.northwestern.edu/article/larry-summers-inflation-economic-policy>
- Svoronos, Jean-Philippe and Rastko Vrbaski, 2020. “Banks’ Dividends in Covid-19 Times.” FSI Briefs 6, Financial Stability Institute, Bank for International Settlements, Basel.
- Trichet, Jean-Claude. 2003. “The ECB’s Monetary Policy Strategy after the Evaluation and Clarification of May 2003.” Speech delivered at the Center for Financial Studies’ key event, Frankfurt am Main, 20 November. <https://www.ecb.europa.eu/press/key/date/2003/html/sp031120.en.html>.
- Valencia, Fabi an, Richard Varghese, Weijia Yao, and Juan Y epez. 2021. “Handle with Care: Regulatory Easing in Times of COVID-19.” *CEPR COVID Economics*, Issue 76, Center for Economic Policy Research, London.
- Wessel, David, and Eric. Milstein. 2022. “Taking Stock of the New Fed and ECB Monetary Policy Frameworks.” Hutchins Center on Fiscal & Monetary Policy at Brookings, The Brookings Institution, Washington DC. <https://www.brookings.edu/research/taking-stock-of-the-new-fed-and-ecb-monetary-policy-frameworks/>.



# PUBLICATIONS

**Macro-Financial Stability in the COVID-19 Crisis: Some Reflections**  
Working Paper No. WP/2022/251