

CHAPTER 4

ASSET PURCHASES IN EMERGING MARKETS

Unconventional Policies,
Unconventional Times

Central banks in some emerging market and developing economies (EMDEs) have employed asset purchase programs, in many cases for the first time, in response to pandemic-induced financial market pressures. These programs, along with spillovers from accommodative monetary policies in advanced economies, appear to have helped stabilize EMDE financial markets. However, the governing framework, scale, and duration of these programs have been less transparent than in advanced economies, and the effects on inflation and output in EMDEs remain uncertain. In EMDEs where asset purchases continue to expand and are perceived to finance unsustainable fiscal deficits, these programs risk eroding hard-won central bank operational independence and de-anchoring inflation expectations. Ensuring that asset purchase programs are conducted with credible commitments to central bank mandates and with transparency regarding their objectives and scale can support their effectiveness.

Introduction

The COVID-19 pandemic has tipped the global economy into its deepest recession since the Second World War. To stabilize financial markets and support activity, many central banks have employed asset purchase programs—often for the first time in the case of emerging market and developing economies (EMDEs). These have involved outright central bank purchases of longer-term financial assets, usually government bonds, and corresponding injections of reserve money into the banking system. This chapter explores how EMDE asset purchase programs have evolved, and assesses their potential benefits and costs.

The purchase of longer-term assets by central banks has both complemented and substituted for other monetary policy tools. This instrument has primarily been used in advanced economy “quantitative easing” programs with the aims of stimulating demand, boosting output, and raising inflation toward targets. Purchases of longer-term assets have usually been employed when the limits of conventional monetary policy tools have been reached—in particular, when short-term monetary policy rates have fallen near their effective lower bound. Asset purchases can directly influence specific financial market segments and asset maturities, and longer-term asset purchases can serve to lower long-term interest rates, which would be only indirectly impacted by conventional monetary policy tools (Haldane et al 2016). These programs can also be used to help

stabilize financial markets and improve market functioning during periods of high volatility and low market liquidity, an objective that did not motivate the early advanced economy asset purchase programs (Christensen and Gillan 2019).

Central banks across advanced economies and EMDEs have responded to the economic and financial market shocks induced by the COVID-19 pandemic with broad-based cuts in short-term policy rates, which in many economies are now at, or close to, their effective lower bounds. One-third of advanced economy central banks have reduced their short-term policy rates to 0 percent or lower, while around 90 percent have lowered them below 1 percent (figure 4.1). Some EMDE central banks (Chile, Costa Rica, Hungary, Paraguay, Peru, Poland, Thailand) have also cut policy rates to less than 1 percent. For additional policy easing and to contain a sharp rise in government bond yields in March 2020, many of these central banks introduced asset purchase programs (Chile, Costa Rica, Hungary, Poland, Thailand). Policy rates remain above 1 percent in 80 percent of EMDEs, but central banks in at least 13 of these EMDEs have also implemented asset purchase programs (figure 4.1).

This chapter addresses the following questions:

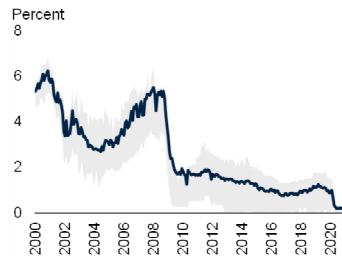
- How have asset purchase programs been designed in EMDEs?
- Have EMDEs benefited from these programs?
- What are the risks associated with these programs?
- What are the main policy lessons for EMDEs?

Note: This chapter was produced by Jongrim Ha and Gene Kindberg-Hanlon. Research assistance was provided by Kaltrina Temaj and Jingran Wang.

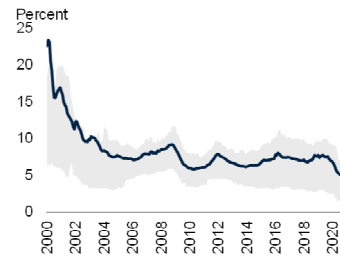
FIGURE 4.1 Policy interest rates and bond yields

In 2020, central banks in advanced economies cut policy rates close to the effective zero lower bound. Toward the end of the year, around 90 percent of advanced economy policy interest rates were below 1 percent, and one-third were at or below zero. In contrast, just 20 percent of EMDE central banks have cut policy rates below 1 percent. In addition to policy rate cuts, many advanced economies and EMDEs initiated asset purchase programs after government bond yields, including those usually considered “safe-haven” assets, spiked in March 2020.

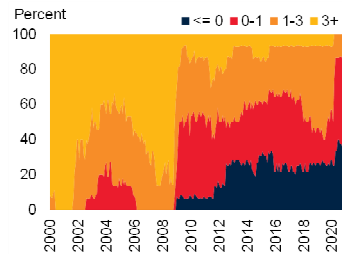
A. Advanced economy policy rates



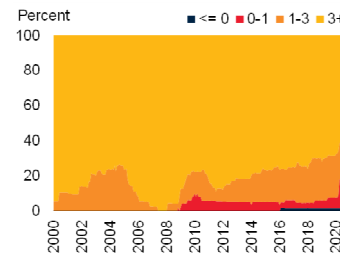
B. EMDE policy rates



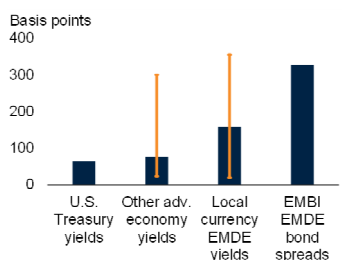
C. Distribution of policy rates: Advanced economies



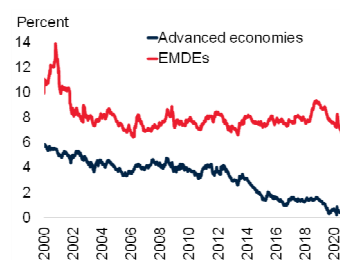
D. Distribution of policy rates: EMDEs



E. Peak increase in bond yields and spreads in March



F. Advanced economy and EMDE 10-year government bond yields



Sources: Haver Analytics; National sources; World Bank.

Note: EMDE = emerging market and developing economies; EMBI = JPMorgan Emerging Market Bond Index.

A.-D. Data for up to 16 advanced economy and 67 emerging and developing economy central banks during 2000-2020.

A.B. Solid line reflects a simple average of policy rates. Shaded region shows the inter-quartile range. E. Maximum increase in local currency government bond yields and the JPMorgan EMBI index of EMDE foreign-currency bond spreads during March 2020 using daily data. Orange whiskers indicate the maximum and minimum increase in 10-year government bonds in 30 advanced economies and 21 EMDEs. Bars indicate the average increase.

F. Average of 10-year government bond yields for up to 30 advanced economies and 22 EMDEs.

[Click here to download data and charts.](#)

Contributions. This chapter contributes to the literature in three ways.

First, it takes stock of the EMDE asset purchase programs that have been announced or implemented since early 2020. It discusses how the programs in EMDEs compare to those in advanced economies in their design, scale, and objectives. To shed light on the topic, the chapter also presents a review of the literature on the macroeconomic and financial effects of programs in advanced economies, including their spillovers to EMDEs.

Second, the chapter is one of the first studies to provide detailed evidence on the effects of asset purchase announcements in EMDEs on financial markets. A few earlier studies have estimated the impact of asset purchase program announcements in EMDEs on bond markets and exchange rates (Arslan, Drehmann, and Hofmann 2020; Hartley and Rebucci 2020; IMF 2020b). This chapter expands on these studies by including the effects on equity markets and by comparing the effectiveness of EMDE asset purchases to that of conventional monetary policy actions, and that of asset purchase programs in advanced economies.

Third, the chapter reviews historical experiences of central bank financing of government deficits in EMDEs. In particular, it reviews the circumstances of economies that experienced episodes of debt monetization and high inflation in the 1980s and early 1990s and draws out parallels and differences with the central bank policies and country circumstances of those EMDEs undertaking asset purchases in 2020. It assesses the circumstances—in particular elevated levels of debt, large fiscal deficits, and weak growth prospects—which may increase the risk that some EMDEs begin to resemble these historic episodes.

Findings. Several findings emerge from this chapter.

- *Diverse design of asset purchase programs in EMDEs.* As of mid-December 2020, 18 EMDEs had announced or implemented asset purchase programs. Asset purchases have

been mainly focused on local currency-denominated government bonds. The size of asset purchases has varied from less than 1 to 6 percent of GDP. Many EMDE central banks have not announced the scale or duration of purchases, and while most have been purchasing only in secondary markets, some have purchased bonds directly from governments.

- *Decline in government bond yields.* Announcements of asset purchase programs appear to have helped stabilize bond markets and boost equity prices without putting pressure on exchange rates. The effects on long-term bond yields and equity prices have been on average greater than the effects of the announcements of monetary policy rate cuts in response to COVID-19. In addition, the announcement effect of EMDE asset purchases on government bond yields (but not equity prices) seems to have been larger than the announcement effects of advanced economy asset purchases. The broader macroeconomic consequences, however, remain to be seen.
- *Risks to central bank credibility and perceptions of debt-monetization.* Recent asset purchase programs in some EMDEs were initiated to support financial stability and orderly market functioning following the spike in bond yields in March 2020. In contrast, during historical episodes of EMDE debt monetization, central banks bought government bonds to finance government deficits by issuing reserve money. Previous episodes of debt monetization differed from the recent experience in being preceded by long periods of high inflation, less credible fiscal and monetary policy frameworks, external debt defaults, and stubbornly high fiscal deficits. For now, macroeconomic conditions in EMDEs are more benign than in these historical episodes. However, the earlier episodes provide a reminder of the risks to central bank credibility if asset purchase programs are used for prolonged monetary financing of fiscal deficits.
- *Effectiveness.* Based on the experience during the pandemic and, in advanced economies,

before it, asset purchase programs have helped reduce bond yields and boosted equity prices during periods of market illiquidity in EMDEs. The recent experience of asset purchase programs, however, may overstate its future effectiveness for three reasons. First, it was set against the backdrop of uniquely accommodative macro-economic policies in advanced economies. Second, it was an unanticipated departure from earlier policy guidance of EMDE central banks that had focused on buttressing their independence. Third, fragile liquidity conditions in EMDE financial markets are conducive to volatile movements in asset prices, possibly leading to unintended consequences of future asset purchases.

- *Policy implications and design of asset purchase programs.* Embedding asset purchase programs in a transparent monetary policy framework that is consistent with inflation and financial stability objectives will reduce the risk that asset purchases are perceived as monetary financing that might de-anchor inflation expectations. Current projections of large fiscal deficits and elevated public debt levels amplify the need for medium-term strategies that avoid this risk and ensure that the benefits of EMDE asset purchase programs outweigh their costs. The need for enhanced frameworks and medium-term fiscal strategies may increase in the absence of the uniquely accommodative global monetary conditions established in response to COVID-19.

The remainder of this chapter is organized into five sections. First, a brief history of asset purchase programs in advanced economies is provided, and their estimated effects on asset prices and macro-economic outcomes are discussed. In the second section, details of the asset purchase programs in EMDEs are presented and compared to those in advanced economies. The third presents evidence on the effects of EMDE asset purchases on financial markets. The fourth section discusses potential risks of EMDE asset purchase programs. The final section concludes with policy implications. A box examines historical episodes of

deficit monetization in EMDEs and considers similarities and differences with EMDEs implementing asset purchases in response to the COVID-19 pandemic.

Background: Asset purchase programs in advanced economies

Quantitative easing has increasingly become part of the monetary policy tool kit of central banks in advanced economies in recent years, when short-term policy interest rates have approached their effective lower bounds at around zero. The use of asset purchase programs by advanced economies appears to have also helped stabilize financial markets in EMDEs during the early stages of the COVID-19 pandemic.

History of asset purchase programs. In 2001, the first major asset purchase program was initiated by the Bank of Japan as short-term interest rates reached zero, consumer price inflation remained weak, and GDP growth was persistently anemic. During the 2007-09 global financial crisis, the U.S. Federal Reserve and the Bank of England cut short-term interest rates close to zero and engaged in large scale QE programs, purchasing domestic sovereign bonds and government-backed mortgage securities. They were joined by the European Central Bank (ECB) in 2015, although the ECB had earlier introduced the Securities Markets Program to ensure liquidity in government bond markets. Ahead of the COVID-19 pandemic, both the ECB and the Bank of Japan were engaged in the continued purchase of sovereign bonds and some private-sector securities.

Monetary policy response to COVID-19. In March 2020, global financial market volatility rose dramatically. Government bond yields, which had fallen in February due to expectations of a sharp decline in economic activity, began to rise in advanced economies as investors sought to increase cash holdings and market intermediaries struggled to absorb large sales volumes (figure 4.1; FSB 2020). Advanced economy asset purchases were initiated or expanded both to improve the functioning of government bond markets and to

stimulate output and inflation by lowering long-term interest rates (figure 4.2).¹ In some cases, asset purchases have since been extended to a broader set of assets—including riskier private sector assets—than in previous programs (Federal Reserve, Bank of England, and ECB).² Asset purchase programs in 2020 were also accompanied by substantial liquidity provision through other mechanisms, such as new credit facilities for commercial banks or lending via repurchase agreements. In many cases, these facilities enabled central banks to finance the purchase of government debt, leading to increases in their indirect exposure to the government (Feyen and Huertas 2019). As a result of these measures, the expansion of central bank balance sheets in 2020 exceeded the initial expansion during the global financial crisis.

The effects of asset purchases in advanced economies. A large literature has found that advanced economy asset purchase programs appear to have helped lift output and inflation, lower bond yields, and support asset prices (annex 4.1). Asset purchase programs that have aimed to improve market functioning, such as the ECB's Securities Market Programme, have been found to reduce risk and liquidity premia and improve market conditions (BIS 2019). Over 80 percent of studies assessing the impact of QE in advanced economies have found statistically significant positive impacts on output and inflation (Fabo et al. 2020; annex table A4.1.2).

Spillovers from advanced economy asset purchases to EMDEs. U.S. monetary policy easing has generally in the past been transmitted to EMDEs through domestic currency appreciation, lower bond yields, higher equity prices, and increased capital inflows.³ Since March 2020,

¹The New York Federal Reserve statement stated that purchases would be implemented to ensure “Smooth function of the market for Treasury securities.” https://www.newyorkfed.org/markets/opolicy/operating_policy_200323.

²In some cases, private sector assets, such as covered bonds (ECB), and corporate bonds, equity ETFs, and real estate investment trusts (Bank of Japan) have been purchased in earlier episodes of QE.

³See, for instance, Bhattacharai, Chatterjee, and Park (2018), Feyen et al. (2015), Rogers, Scotti, and Wright (2018), and Tillman (2016). Using novel empirical strategies, these studies provide evidence on the significant transmission of U.S. monetary policy shocks into financial markets in other open economies.

benign global financial conditions, partly driven by the launch of major asset purchase programs in advanced economies, are likely to have reduced the extent of capital outflows from EMDEs and depreciations of their currencies. More generally, advanced economy financial conditions, which have been affected by their domestic asset purchase programs, have been shown to have substantial spillovers to EMDE financial conditions during the COVID-19 pandemic (Ahmed et al. 2020).

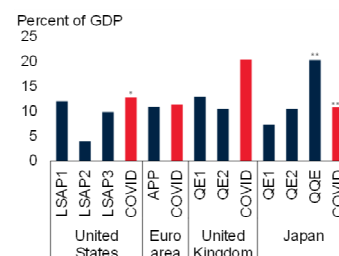
Risks associated with asset purchase programs. By lowering longer-term interest rates, asset purchases can both reduce returns to lenders and increase those to borrowers. By raising the prices not only of bonds but also of risky assets such as equities and housing, asset purchases can increase the wealth of those who hold such assets (Colciago, Samarina, and de Haan 2019). Some studies—of the euro area, Japan, the United Kingdom, and the United States—have found that asset purchase programs have increased wealth or income inequality.⁴

However, other studies have found that the benefits to employment and incomes for lower-income workers have outweighed such regressive redistribution effects so that, overall, asset purchase programs have either had insignificant overall distributional effects or have lowered wealth or income inequality (Inui, Sudo, and Yamada 2017; Lenza and Slacalek 2018). In addition to distributional effects, low interest rates driven by asset purchase programs or other accommodative policies could lead to misallocation of capital and market concentration, and reduce technological dynamism, thus lowering productivity growth (Gopinath et al. 2017; Liu, Mian, and Sufi 2019). Finally, the portfolio channel of asset purchase programs may incentivize excessive risk-taking and lead to financial instability (Adrian and Liang 2016).

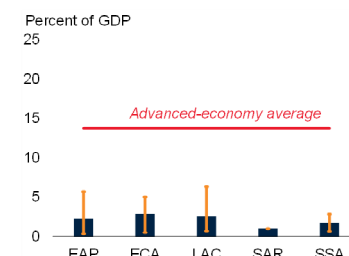
FIGURE 4.2 Scale of unconventional monetary policies

Announced and implemented asset purchases by EMDE central banks have been smaller than those in advanced economies. In both advanced economies and EMDEs, asset purchases have frequently been accompanied by increased lending to banks, such that the overall increase in central banks' balance sheet has been larger than asset purchases. In advanced economies, the response to COVID-19 has exceeded the initial response to the global financial crisis in terms of the total expansion of central bank assets.

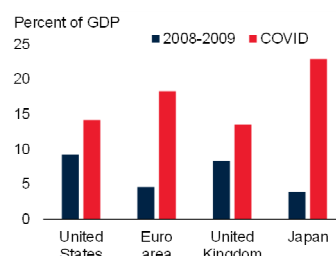
A. Advanced economy asset purchases



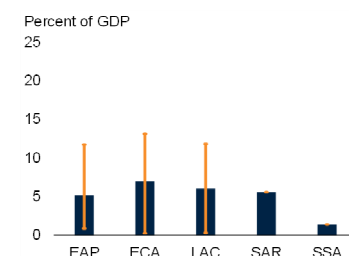
B. EMDE announced or completed purchases



C. Advanced economy central bank balance sheet expansions



D. EMDE central bank balance sheet expansion since January 2020



Sources: Haver Analytics; National sources; World Bank.

Note: EMDE = emerging market and developing economies; EAP = East Asia and Pacific, ECA = Europe and Central Asia, LAC = Latin America and the Caribbean, SAR = South Asia, SSA = Sub-Saharan Africa. All asset purchase and balance sheet figures are estimates based on published data.

A. Announced purchases of sovereign and private sector bonds in percent of nominal GDP. In the U.S., the large-scale asset purchase (LSAP) programs began in 2008 (LSAP1), 2010 (LSAP2), and 2012 (LSAP3). The European Central Bank's 2015 Asset Purchase Program (APP) is given as the original announced program size. U.K. programs include QE1, launched in 2009, QE2, launched in 2010 and expanded in 2011, and the COVID program launched in March 2020. The Bank of Japan's first QE program during 2001-06 is given as "QE1," while the second QE program launched in 2010 is given as QE2. The "Quantitative and Qualitative" program launched in 2013 is given as QQE.

* The "COVID" package launched in March 2020 is not specified in scale, so purchases are only shown from the start of the program to November 2020.

** QQE program reflects initially announced purchases in March 2013. Subsequent expansions of the program increased liquidity by 72 percent of GDP between March 2013 and January 2020.

*** Bank of Japan COVID support package is not limited. Purchases to November are provided.

B. Announced or completed purchases (where no announcement exists) relative to 2019 nominal GDP as of November 2020. Bar shows average in each region. Orange whiskers show regional range. Red line shows average of advanced economy programs launched in 2020.

C. Increase in central bank balance sheets during August 2008-December 2009 and from January to November 2020.

D. Change in central bank balance sheets in percent of nominal GDP since January 2020 in those economies undertaking asset purchases. Monthly data to October 2020. Bar shows average in each region. Orange whiskers show regional range.

[Click here to download charts and data.](#)

⁴ See Bunn, Pugh, and Yeates (2018); Juan-Francisco, Gomez-Fernandez, and Ochando (2018); Mumtaz and Theophilopoulos (2017); and Taghizadeh-Hesary, Yoshino, and Shimizu (2020).

Asset purchase programs in EMDEs

In 2020, 18 EMDEs announced or implemented asset purchase programs. These tended to be smaller than programs in advanced economies. In many cases, EMDE programs have been less transparent than those in advanced economies in their objectives, duration, and scale.

EMDEs using asset purchase programs. Faced with rising government financing costs, deteriorating financing conditions, and large capital outflows in March 2020, several EMDE central banks joined central banks in advanced economies in launching asset purchase programs (World Bank 2020). Most of these EMDEs purchased government or private bonds for the purpose of meeting macroeconomic or financial stability objectives for the first time.⁵ As of mid-December 2020, the EMDE central banks that had announced or implemented asset purchase programs were Bolivia, Chile, Colombia, Costa Rica, Croatia, Ghana, Guatemala, Hungary, India, Indonesia, Malaysia, Philippines, Poland, Romania, Rwanda, South Africa, Thailand, and Turkey.⁶ Other large EMDEs have taken legal steps to initiate purchase programs, such as lifting constitutional bans on outright monetary financing. For example, the central bank of Brazil has been granted emergency powers to purchase government bonds.

Features of asset purchase programs in EMDEs. The asset purchase programs announced by EMDE central banks vary widely in the intended scale of purchases, asset types, and duration. The full details of many programs, however, have not been specified (table 4.1).

- *Scale of purchases.* The size of announced or completed purchases has remained modest so

far, ranging from 1 to 6 percent of annual GDP (figure 4.2). However, purchases may continue to be expanded in many of these economies.

- *Types of assets.* EMDE asset purchases have largely focused on local currency-denominated government debt. Several programs also have involved the purchase of bank bonds or mortgage bonds. Only a few EMDE central banks have announced the maturities of the bonds they have planned to purchase.
- *The duration of purchase programs.* The duration of asset purchase programs has generally been unspecified in EMDEs. Some central banks appear to have conducted one-off purchases at various times between March and May. Purchases have continued in many economies that have not announced details of the final program size or duration, even as government bond yields fell below their pre-COVID levels in April (figure 4.3).
- *Primary and secondary market purchases.* Most EMDE central banks have purchased, or plan to purchase, government and private bonds exclusively in secondary markets, although some have also purchased government debt directly from the government. In some cases, these latter purchases have been specifically acknowledged as being for the purpose of financing the 2020 fiscal deficit.

Comparison with asset purchase programs in advanced economies. Unlike many advanced economy central banks' recent and past asset purchase programs, many central banks in EMDEs have not announced the parameters of their asset purchase programs, including the size and duration of planned purchases.⁷ They have also focused on purchasing government debt and bank bonds, whereas asset purchase programs in advanced economies have broadened their asset purchases to include riskier non-bank private sector assets.

⁵ Pre-2020 examples of asset purchases by EMDE central banks to meet macroeconomic or financial stability objectives are rare. One exception is the case of Hungary: in December 2017, its central bank (MNB) announced the introduction of a mortgage bond purchase program to support the mortgage bond market.

⁶ Programs based on long-term repurchase agreements such as in Mexico or Serbia are not included here, although these in practice may be similar in their effects to asset purchase programs. See, for details, Bank of Spain 2020; BIS 2020; Hartley and Rebucci 2020; IMF 2020a; and Yale 2020.

⁷ Among advanced economy programs in response to COVID-19, key exceptions are the open-ended QE announcement by the Federal Reserve (March 23, 2020) and by the Bank of Japan (April 27, 2020).

EMDE central banks' asset purchases (or planned purchases) have been smaller than those in advanced economies, with most EMDE programs equivalent to less than 2 percent of annual GDP. Advanced economy asset purchase announcements or completed purchases in response to COVID-19 have averaged 14 percent of GDP. In some EMDEs, central bank balance sheets have expanded by more than asset purchases on account of increased liquidity provision to banks. At the same time, domestic banks have in turn increased their holdings of government debt in some economies (Hungary, Indonesia, Poland, Romania, South Africa; IMF 2020b).⁸ In other cases, balance sheets have expanded by less than bond purchases as central banks have sought to sterilize the effect of purchases on bank reserves, for example by selling foreign-currency assets.

Finally, unlike most advanced economy central banks, most EMDE central banks launched their asset purchase programs before their policy interest rates had reached their effective lower bound, in order to reduce risk and term premia in longer-term interest rates. Policy rates averaged 3.6 percent as of end-November 2020 in EMDEs that had announced asset purchase programs, and 70 percent of these economies had monetary policy rates above 1 percent.

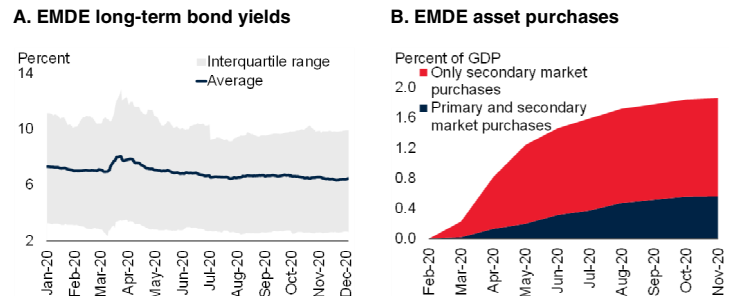
Benefits of EMDE asset purchase programs

Announcements of asset purchase programs by EMDE central banks in 2020 were predominantly aimed at helping to stabilize domestic financial markets. They appear to have reduced bond yields by more than announcements of policy rate cuts or advanced economy asset purchase announcements. They also appear to have boosted equity markets more than announcements of policy rate cuts, but to a lesser extent than asset purchase program announcements in advanced economies.

⁸In 15 EMDEs that implemented asset purchase programs, central banks' balance sheets expanded in 2020 by around 6 percentage points of GDP on average, which is around three times average annual balance sheet expansion over 2010-19.

FIGURE 4.3 EMDE asset purchases and bond yields

Following an increase in March 2020, EMDE government bond yields fell below their levels at the start of the year. EMDE asset purchase programs have generally continued to expand even as yields have fallen, although the pace of asset purchases has slowed since May.



Sources: Haver Analytics; National sources; World Bank.

Note: EMDE = emerging market and developing economies.

A. Ten-year bond yields in 21 EMDEs. Shaded region shows the inter-quartile range of bond yields.
B. Cumulative asset purchases of 14 EMDEs where monthly purchase data are available, in percent of total GDP. EMDEs purchasing in both primary and secondary markets include Indonesia and the Philippines. EMDEs purchasing only in secondary markets include Bolivia, Chile, Colombia, Croatia, Hungary, Indonesia, Malaysia, Poland, Romania, South Africa, Thailand, and Turkey. In economies where November data are unavailable, purchases to October or September are used. All asset purchase figures are estimates based on published data.

[Click here to download data and charts.](#)

Channels for the transmission of announcements of asset purchases to financial markets and the economy

Objectives of asset purchases in EMDEs: stabilizing financial markets. EMDE asset purchase programs have generally been used to provide liquidity and reduce volatility in domestic financial markets, particularly the markets for government bonds. For instance, central banks in Poland and South Africa have explicitly cited “providing liquidity” as one of the objectives of their programs.⁹

Analytical considerations: Effects on financial markets. Asset purchase programs would be expected to lower long-term interest rates through several channels, including by reducing liquidity and term premia, and by signaling that an accommodative stance of monetary policy may

⁹During the 2007-09 global financial crisis, different types of policies, such as in reduction in reserve requirements, were used by EMDEs to ease liquidity conditions, and they were partially effective (Ishi, Stone, and Yehoue 2009; Yehoue 2009). Similarly, to reduce market volatility during the 2013 “taper tantrum” episode, EMDEs deployed a range of policy tools, which included capital flow management measures and foreign exchange interventions (Sahay et al. 2014). Local currency-denominated bond purchases, however, were generally not used on these occasions.

persist for longer than might have been expected on the basis of policy history.¹⁰ Empirical evidence, mainly from advanced economies, suggests that the effects of conventional monetary policy tend to be weaker during economic downturns or crises than during expansions or normal periods (Angrist, Jordà, and Kuersteiner 2018; Barnicon and Matthews 2015; Kurov 2012).¹¹ Asset purchases may help overcome this by lowering the longer end of the yield curve. To the extent that an announcement of asset purchases lowers returns on government bonds and improves perceptions of the economic outlook, the prices of riskier assets such as equities are also likely to benefit. Finally, by lowering longer-term interest rates, asset purchase programs may be expected to lead to depreciation of the domestic currency.

Empirical literature: Effects on financial markets.

Recent studies of the impact of asset purchase announcements on EMDE financial markets conclude that they have generally helped stabilize rising long-term bond yields (Arslan, Drehmann, and Hofmann 2020; Hartley and Rebucci 2020; IMF 2020b; World Bank 2020). At least one study concluded that the impact of asset purchase programs on EMDE financial markets may even have been greater than in advanced economies, possibly because these programs generally came as a surprise and because EMDE bond markets tend to be less deep than those in advanced economies, and hence affected more by large transactions (Hartley and Rebucci 2020).

Estimating the short-term effects of asset purchases in EMDEs

Methodology. The reactions of daily financial asset prices—long-term (10-year) government

bond yields, exchange rates vis-a-vis the U.S. dollar, and equity price indices—around the announcements of EMDE asset purchase programs were examined using a panel regression framework. The regression controls for time fixed effects—hence removing common global shocks—and cross-section fixed effects—hence removing country-specific factors—as well as policy rate changes and lags of the dependent variables (annex 4.2). The sample includes 26 EMDEs, 14 of which announced at least once the launch or expansion of asset purchase programs. This provides 25 announcement events since March 2020 (table 4.1).¹² The reactions of asset prices following EMDE asset purchase announcements are compared to their reactions in response to advanced economy asset purchase announcements, and to announcements of conventional policy rate cuts.¹³ The response of asset prices is assessed in the narrow window of five to seven days around the announcement to ensure that the results are not contaminated by other news. In addition, an event study framework provides a robustness check for the regression analysis, as well as a more detailed analysis of country-specific results (annex 4.3).

Estimated effects of EMDE asset purchases

- *Bond markets.* The estimated initial reaction of local currency-denominated long-term bond yields suggests that the announcements of asset purchase programs in EMDEs in 2020 helped lower yields that had been rising amid heightened risk and liquidity strains. The asset purchase announcements were associated, on average, with a peak 34 basis point decline in long-term bond yields within two days (figure 4.4).¹⁴ These effects are larger than might have been expected from the experience with pre-pandemic advanced economy programs. For example, the Bank of England and Federal Reserve's first major programs are estimated to

¹⁰ On the theoretical transmission channels of asset purchase programs, and monetary policies more generally, into bond markets, see Eggertsson and Woodford (2003), Gertler and Karadi (2015), Joyce et al. (2012), and Krishnamurthy and Vissing-Jørgensen (2011).

¹¹ This may reflect an asymmetric response of term premia to the state of the economy, such that borrowing costs for households or firms rise, even though policy rates go down (Hanson and Stein 2015), or weaker bank credit mechanisms during crises. Alternatively, it may be that perceptions about the future path of policy rates reflect uncertainty about future policy stances and the economic outlook (Tilman 2020; Van Nieuwerburgh and Veldkamp 2006).

¹² Among the EMDEs that announced asset purchase programs, four (Bolivia, Costa Rica, Guatemala, and Rwanda) were not included in the study because the announcement date is not clear or daily financial data are not available.

¹³ All comparisons are relative to responses in EMDEs without asset purchase program announcements.

¹⁴ These are based on the estimation of the baseline model. The effects based on the alternative model were similar.

have reduced domestic long-term bond yields by 15-25 basis points for programs roughly equivalent to 4 percent of GDP, twice the scale of the average asset purchase program implemented in EMDEs so far (figure 4.2; table A4.1.1; Christensen and Rudebusche 2012; Joyce et al. 2011; Williams 2014).¹⁵

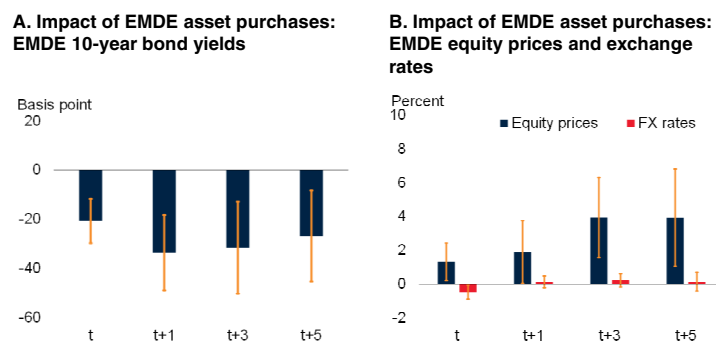
- *Equity markets.* The asset purchase announcements in EMDEs were associated with a 1.9 percent increase in benchmark equity indices within two days of the announcements. Within five working days, equity prices increased by 3.9 percent.
- *Currency markets.* EMDE asset purchase announcements were not followed by statistically significant EMDE exchange rate movements in either direction. That said, in view of the broad-based downward pressures on EMDE currencies in March-April 2020, the multiple asset purchase announcements in advanced economies as well as EMDEs over this period may have helped stabilize currency markets and dampen further capital outflows and currency depreciations among EMDEs.¹⁶

Comparison with announcements of policy rate cuts

Effects of monetary policy rate cuts in EMDEs. Along with the implementation of asset purchase programs, EMDEs have responded to the COVID-19-induced recession with monetary policy rate cuts. The 14 EMDE central banks considered here implemented 34 policy rate cuts between March and July 2020, with rates lowered by 50 basis points on average. Announcements of such policy rate cuts appear to have had modest effects on long-term EMDE bond yields. Following the announcements of the policy rate

FIGURE 4.4 Effects of EMDE asset purchase announcements

The announcement of asset purchase programs in EMDEs helped stabilize domestic financial markets. Following the asset purchase announcements in EMDEs, local bond yields declined by up to 34 basis points and equity prices increased by 4 percent. The impacts on exchange rates were not statistically significant.



Sources: Haver Analytics; National sources; World Bank.

Note: EMDE = emerging market and developing economies. Panel regression results based on daily financial asset prices in 26 EMDEs. Twenty-five asset purchase announcements in 14 EMDEs are studied (annex 4.2). Horizontal axes indicate days after the announcements of asset purchase (t = 0). Standard errors are clustered by countries. Blue and red bars indicate point estimates and orange whiskers indicate 90 percent confidence intervals.

B. FX rates indicate foreign exchange rates of EMDE currencies vis-à-vis the U.S. dollar. An increase in the exchange rate denotes a depreciation of EMDE currencies.

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cuts, long-term bond yields declined by 13 basis points, within two business days, and the impacts quickly dissipated (figure 4.5).¹⁷ The results suggest that policy rate cuts were largely perceived to be temporary or anticipated. Other factors limiting the effect on bond yields may have included an offsetting increase in uncertainty about the path of future policy rates following the cut. From April 2020 onwards, when financial conditions had eased, the pass-through strengthened; long-term bond yields declined by up to 40 basis points per 1 percentage point policy rate cut.

Comparison with announcements of advanced economy asset purchase programs

Announcement effects in advanced economies. Announcements of asset purchase programs by the Federal Reserve and the ECB were followed by

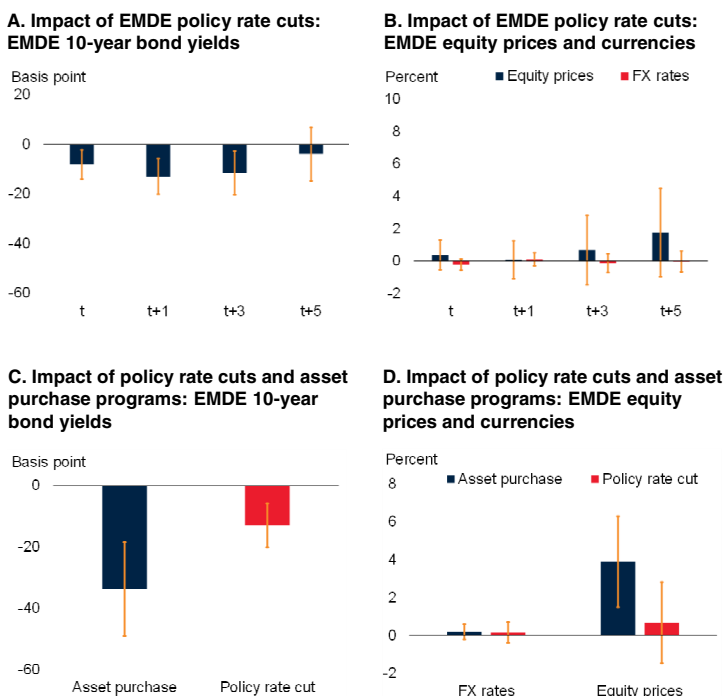
¹⁵The effects summarize the various estimates in the literature and are scaled to be comparable (Williams 2014).

¹⁶For instance, when sovereign credit default swap (CDS) spreads were instead employed as the dependent variable in the regression, it was estimated that announcements of EMDE asset purchases were followed by a narrowing of the spread by around 10 basis points within two business days, although the impacts were found to quickly dissipate. These results were robust to models that controlled for various types of global factors, including US asset prices and the CBOE volatility index. This validates the baseline model with time and cross-section fixed effects.

¹⁷The estimated impacts of domestic policy rate cuts on long term yields are similar to estimates of 10-30 basis points per 1 percentage point policy rate cut by IMF (2020b).

FIGURE 4.5 Effects of policy rate cuts and asset purchase announcements in EMDEs

Announcements of central bank interest rate cuts in EMDEs were followed by declines in bond yields that were smaller than those after asset purchase announcements. Equity prices and exchange rates did not respond significantly to policy rate cuts in EMDEs.



Sources: Haver Analytics; National sources; World Bank.

Note: EMDE = emerging market and developing economies. Panel regressions results based on daily financial asset prices in 26 EMDEs. 34 policy rate cuts and 25 asset purchase announcements in 14 EMDEs between March and July 2020 are studied (annex 4.2). FX rates indicate foreign exchange rates of EMDE currencies vis-à-vis the U.S. dollar. An increase in the exchange rate denotes a depreciation of EMDE currencies. Blue and red bars indicate point estimates and orange whiskers indicate 90 percent confidence intervals.

A.B. Horizontal axes indicate days after the announcements of policy rate cuts (t = 0).

C.D. Maximum cumulative impact of EMDE asset purchase programs and EMDE policy rate cuts.

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declines in bond yields that were generally smaller than both the declines in bond yields in EMDEs after announcements of domestic EMDE asset purchases and the declines in bond yields in advanced economies after previous advanced economy programs.¹⁸ U.S. bond yields fell by 16-21 basis points within a day of each of the Federal Reserve's announcements on March 15 and 23 and April 9, 2020.¹⁹ In response to the

announcement of asset purchases by the ECB on March 19, French and German long-term bond yields fell by 26 and 12 basis points, respectively, over the following three days, although there was wide heterogeneity across other euro-area economies.

Spillover effects on EMDEs of advanced economy asset purchase programs. Although the response of asset prices in advanced economies in 2020 was more muted than following their previous asset purchase programs, there were sizable spillovers to EMDE asset prices from the announcements by the Federal Reserve and the ECB.²⁰ Within a week of the asset purchase announcements by the Federal Reserve and the ECB, EMDE bond yields declined by up to 22 basis points, and equity prices rose by up to 5.7 percent. EMDE currencies appreciated against the U.S. dollar by around 1 percent a few business days after the announcements (figure 4.6).²¹

Risks associated with asset purchase programs in EMDEs

The experience of recent EMDE asset purchase programs during COVID-induced market volatility may overstate their future effectiveness if their use is prolonged or expanded. First, these programs were a surprise departure from the previous policy direction of EMDE central banks that had focused on reinforcing their credibility and independence. Concerns about central bank independence may grow if there is a large, persistent deterioration in fiscal positions in EMDEs, leading to rising inflation expectations and bond yields. Second, fragile liquidity in EMDE financial markets can lead to

yields declined persistently, partly reflecting the signaling effects of the second announcement of open-ended asset purchases.

²⁰ These results are consistent with the literature on evidence of significant international spillovers of advanced economy QE to EMDE financial markets (Bhattarai, Chatterjee, and Park 2018; Chen et al. 2016; Rogers, Scotti, and Wright 2018).

²¹ The effects of domestic policy rate cuts and spillovers from advanced economy asset purchase program announcements were estimated based on data for the 14 EMDEs that have announced asset purchase programs. A larger group of 26 EMDEs, including 12 EMDEs that have announced no asset purchase programs, was also examined. The results were similar.

¹⁸ This result is consistent with Hartley and Rebucci (2020) and may partly reflect less deep EMDE financial markets than in advanced economies.

¹⁹ Yields fluctuated from the second trading days after the announcements, reflecting the rising volatility in global financial markets in mid-March 2020. That said, from March 26, U.S. bond

unpredictable changes in asset prices. Third, recent asset purchase programs in EMDEs were set against the backdrop of uniquely accommodative and synchronized macroeconomic policies in advanced economies.

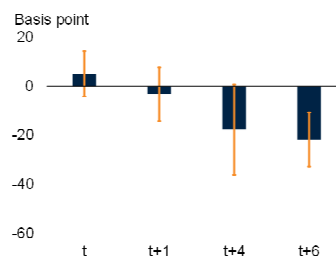
Fragile institutional frameworks. The asset purchase program announcements in EMDEs took financial markets by surprise, after decades of central bank policy focused on establishing independence from fiscal and political institutions and building credibility. Unless asset purchase programs are viewed as consistent with central bank mandates centered on price stability, they may imperil the operational independence, transparency, and credibility of central banks that have struggled in the past to distance themselves from political pressures (Ha, Kose, and Ohnsorge 2019). Inflation remains higher in EMDEs than in advanced economies, and inflation expectations continue to be less well anchored (Ha, Stocker, and Yilmazkuday 2020; Kose et al. 2019). If asset purchases are perceived to be a signal of lasting and unsustainable debt monetization, inflation expectations may jump in EMDEs, particularly in those where they are poorly anchored (Blanchard and Pisani-Ferry 2020; Woodford 2004).

Rapidly deteriorating fiscal positions. Asset purchase programs may amplify capital flight and currency depreciations that are triggered by government solvency concerns (annex 4.4; Hofmann, Shim, and Shin 2020). Governments have appropriately responded to the disruptions caused by the COVID-19 pandemic with unprecedented fiscal stimulus. Current projections are for fiscal deficits in those EMDEs engaged in asset purchases to rise to nearly 10 percent of GDP, on average, in 2020, and to average close to 5 percent of GDP over the following five years (box 4.1). This is close to the average deficit in the cases of the 1980s and 1990s when EMDE governments turned to monetization (annex 4.4). Today's prospective fiscal deficits over the medium term amplify the risk that confidence in monetary and fiscal policies might at some point decline. EMDEs with greater foreign participation in financial markets, particularly where liabilities to foreign investors are denominated in foreign currency, may be at a higher risk of disruptions

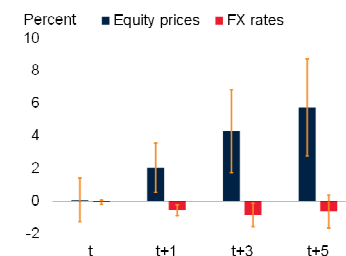
FIGURE 4.6 Spillovers from advanced economy asset purchases to EMDEs

Asset purchase programs launched in 2020 by the U.S. Federal Reserve and the European Central Bank had substantial spillovers to EMDE financial markets. Following advanced economy asset purchase announcements, EMDE bond yields declined by over 20 basis points; equity prices rose by up to 5.7 percent; and EMDE currencies appreciated against the U.S. dollar by around 1 percent.

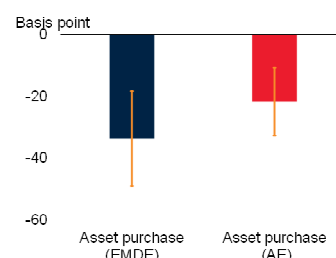
A. Impact of advanced economy asset purchases: EMDE 10-year bond yields



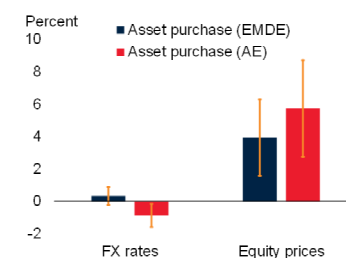
B. Impact of advanced economy asset purchases: EMDE equity prices and currencies



C. Impact of advanced economy and EMDE asset purchases: EMDE 10-year bond yields



D. Impact of advanced economy and EMDE asset purchases: EMDE equity prices and currencies



Sources: Haver Analytics; National sources; World Bank.

Note: AE = advanced economies; EMDE = emerging market and developing economy.

Panel regressions results based on daily financial asset prices in 26 EMDEs around asset purchase announcement by the U.S. Federal Reserve, the European Central Bank, and 14 EMDEs (annex 4.2). FX rates indicate exchange rates of EMDE currencies against the U.S. dollar. An increase in the exchange rate denotes a depreciation of EMDE currencies. Blue and red bars indicate point estimates and orange whiskers indicate 90 percent confidence intervals.

A.B. Horizontal axes indicate days after the announcements of asset purchase (t = 0).

C.D. Maximum cumulative impact of advanced economy and EMDE asset purchase announcements.

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from changes in global sentiment centered on solvency concerns, which can trigger fire sales of bonds that put pressure on EMDE bond yields and exchange rates (Carstens and Shin 2019).

Less developed capital markets. The issuance of local currency-denominated government debt in EMDEs has doubled since 2011. Nevertheless, EMDE government bond markets are less deep than those of advanced economies. Bid-ask spreads are often substantially wider in EMDEs than in advanced economies, and have less

BOX 4.1 Remembering history: Monetary financing of fiscal deficits in EMDEs

In the past, monetary financing of fiscal deficits has been associated with severe macroeconomic instability, particularly during the 1980s and 1990s. While current EMDE policies and institutional characteristics differ materially from these earlier episodes, adverse consequences may emerge unless their lessons are heeded.

Introduction

Recent asset purchase programs in EMDEs have been largely designed to support market liquidity and improve financial conditions. In some cases, however, purchases have been used explicitly to finance fiscal deficits. These purchases may raise concerns that, over time, asset purchase programs will transition into a prolonged period of monetary financing of fiscal deficits—a practice associated with severe macroeconomic instability in the 1980s and 1990s. Historically, EMDEs where central banks have undertaken policies with some similarities to asset purchase programs, such as large-scale liquidity injections and money creation to finance government deficits, have in some cases experienced persistently high inflation and weak economic growth (Jacome et al. 2011, 2018). In this box, the characteristics of five such episodes in the 1980s and 1990s are explored: they occurred in Argentina, Brazil, Bolivia, Peru, and Turkey (annex 4.4). This box examines two questions regarding these historic episodes:

- What were the drivers and costs of monetary financing of fiscal deficits?
- How do EMDEs implementing asset purchase programs today differ from these case studies?

Drivers and consequences of monetary deficit financing

Debt monetization episodes in EMDEs. In the 1980s, several EMDEs maintained persistently large fiscal deficits that were financed to a large degree through central bank currency issuance and accompanied by exceptionally high inflation (IMF 2001). Debt monetization tended to increase in these episodes after external defaults shut down access to foreign currency borrowing (Argentina, Brazil, Bolivia, and Peru) or foreign capital inflows reversed as external imbalances grew (Turkey). Beginning in the 1980s, these episodes, especially in Latin America, resulted in prolonged output contractions or stagnation, and macroeconomic instability.

Mounting vulnerabilities. In these episodes, debt monetization was accompanied by large and sustained fiscal deficits, banking sector losses, high external debt, persistent current account deficits, and capital outflows (Kaminsky and Reinhart 1999; Reinhart and Savastano 2003). Monetization of government deficits was accompanied by prolonged periods of high inflation (in excess of 80 percent per year, on average, in the decade ahead of crises) and a de-anchoring of inflation expectations, paving the way for further instability.

Self-reinforcing spiral of deficit monetization, inflation, and deficits. External defaults in the early 1980s (Latin American economies) or rising external borrowing risk premia in the early 1990s (Turkey) required fiscal deficits to be funded by domestic sources. Many governments turned increasingly to monetization following failed attempts at fiscal consolidation (Dornbusch and de Pablo 1990; FDIC 1997; Sachs and Morales 1988). Monetary accommodation of large fiscal deficits, and the associated inflation, led to a self-reinforcing spiral of rising inflation, which eroded the real tax base and raised borrowing costs further, and was in turn met with further expansion of central bank reserve money to meet rising government financing needs.^a

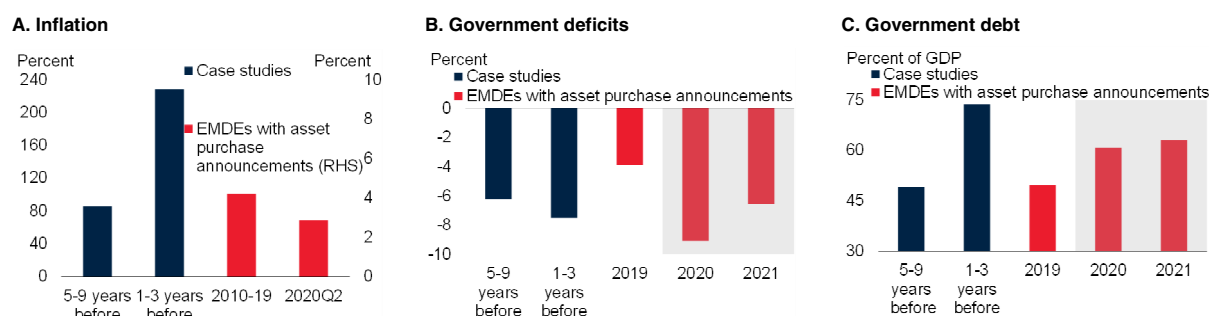
Lost decade. The financing of fiscal deficits through monetization contributed to a prolonged period of macroeconomic instability in many EMDEs and may have delayed efforts to restructure debt and reduce fiscal deficits. There were a series of external defaults and restructurings over 12-17 years in the Latin American episodes.^b In the 1980s, output growth was on average 3-6 percentage points a year lower than in the 1970s in the affected Latin American economies (annex 4.4).

^a There is debate over whether some hyperinflations, such as those in Brazil and Argentina in the late 1980s, were preceded by a monetization of debt, or whether rapid expansion of reserve money was an overly accommodative response to devaluations and rapidly rising country risk premia which in turn led to rapid increases in money demand (Kiguel and Liviatan 1995).

^b In Turkey, capital inflows were largely private and there was no sovereign default, but foreign currency capital flight from the banking sector required intervention from the central bank that resulted in the loss of half of its foreign currency reserves (Celasun 1998).

BOX 4.1 Remembering history: Monetary financing of fiscal deficits in EMDEs (continued)**FIGURE B4.1.1 Macroeconomic developments prior to debt monetization episodes**

Five EMDE case studies of episodes in the 1980s and 1990s illustrate the severe macroeconomic instability that can follow sustained and large-scale debt monetization. A decade of large fiscal deficits financed by central banks led to rising inflation, large currency devaluation, and lost output growth. The economic and financial positions of EMDEs that announced asset purchase programs in 2020 differ materially from these cases. However, their fiscal deficits are estimated to have increased to nearly 10 percent of GDP on average in 2020 and they are projected to average 5 percent over the subsequent 5 years.



Sources: Haver Analytics; IMF; National Sources; World Bank.

Note: EMDE = emerging market and developing economies. Country case studies include Argentina (1989), Bolivia (1985), Brazil (1990), Peru (1990), and Turkey (1994). Years listed are the year in which inflation and debt-monetization rates were at their peak (annex 4.4). Historical episodes are reported in the blue bars as the average of the five episodes in the 5-9 years ahead and 1-3 years ahead of the peak rate of inflation or debt monetization in the case study economies. Inflation takes the median of these episodes in order to reduce the influence of outliers. Red bars indicate the average of those EMDEs undertaking asset purchase programs since the emergence of the COVID-19 pandemic in the years indicated (see table 4.1 for economies included).

B.C. The shaded region indicates the average of the fiscal deficit projected in the IMF's October 2020 *World Economic Outlook* for those EMDEs undertaking asset purchase programs.

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Differences with modern asset purchase programs

In many important respects, today's EMDEs are in considerably stronger economic and financial positions than those in the cases described above, so that they can be expected to be more resilient to adverse shocks.

More resilient monetary policy frameworks. In contrast to the EMDEs in the earlier episodes, annual inflation in the EMDEs that implemented asset purchase programs in 2020 was just 2.9 percent in 2020Q2 (figure B4.1.1). Current expectations are that inflation will remain below target in both 2020 and 2021 in these EMDEs, suggesting that in those economies where policy rates are close to the zero lower bound, asset purchases may be an appropriate response for inflation as well as financial stability mandates (chapter 1). Almost all EMDEs with recent asset purchase program announcements have adopted inflation targeting regimes and abandoned exchange rate pegs (Ha, Kose, and Ohnsorge 2019). Indices of central bank transparency and independence have improved over the past two decades in all the EMDEs implementing asset purchases, although they remain below levels in major advanced economies.

Stronger fiscal frameworks. In contrast to the earlier episodes, in which fiscal policy was strongly procyclical,

today's EMDEs have introduced stronger fiscal frameworks (Abiad et al. 2012; Frankel, Vegh, and Vuletin 2013). Of the EMDEs that recently announced asset purchases, half have fiscal rules in place that help ensure debt sustainability. Prior to 2020, on average, their government debt-to-GDP ratio was similar to, but their fiscal deficits were 3 percentage points of GDP smaller than at the start of the historical episodes (figure B4.1.1).

Lower external debt. In the historical cases, external debt expanded rapidly before these countries were largely cut off from international markets (Kose et al. 2020). In EMDEs that recently announced asset purchase programs, external debt was about 10 percentage points of GDP lower than average external debt levels at the start of the decade preceding the crisis in the case studies. In addition, for most EMDEs with recent asset purchase programs, external debt is largely denominated in local currency, whereas much of the external borrowing in the earlier cases was denominated in U.S. dollars (BIS 2020; FDIC 1997).^c

^c Some EMDEs that are conducting asset purchase programs, such as Indonesia and Turkey, have foreign currency-denominated government liabilities amounting to over one-quarter of debt stocks (BIS 2020).

BOX 4.1 Remembering history: Monetary financing of fiscal deficits in EMDEs (*continued*)

Similarities with recent EMDE asset purchase programs

Substantial rise in fiscal deficits. The COVID-19 global recession has required an unprecedented fiscal response. Current projections are for fiscal deficits in the EMDEs engaged in asset purchases to rise to nearly 10 percent of GDP, on average, in 2020, and to average close to 5 percent of GDP over the following 5 years. This is close to the average deficit in the historical case studies where EMDE governments turned to monetization in the 1980s and 1990s.

Initially benign external conditions. Central banks and governments around the world implemented unprecedented stimulus in 2020. This synchronicity of monetary and fiscal support measures across countries may have increased investor risk appetite, contributing to benign financing conditions which may subsequently reverse. Previous reversals of global financial conditions alongside elevated debt and fiscal deficits have led to rising risk premia and a pivot to monetary financing of deficits and financial market volatility. Low real interest rates in advanced economies in the 1970s enabled an accumulation of financial vulnerabilities and easy monetary policy in many EMDEs. As global interest rates rose steeply in 1979-80 in response to inflationary

pressure, it became clear that debt in some Latin American countries was not sustainable, triggering a series of external defaults (FDIC 1997). In Turkey, capital inflows largely dried up in the runup to the 1994 crisis, when concerns rose over rising fiscal and current account deficits.

Conclusion

The historical case studies show how deficit monetization were generally driven by the need to finance large fiscal deficits following a deterioration in market financing conditions. In many cases, rapidly rising government financing costs followed a build-up of external and government debt in a poor macroeconomic environment, including persistently high inflation. External factors also contributed, including the rapid rise in global real interest rates in the late 1970s. Periods of deficit monetization were associated with significant macroeconomic instability and weak or negative rates of GDP growth.

Today, EMDEs undertaking asset purchase programs have significantly better-anchored inflation expectations and smaller external debt. However, if large financing needs persist, they could become increasingly costly once global financial conditions tighten. The lack of access to cheap finance was one of the reasons governments resorted to monetary financing in these past episodes.

predictable effects on yields (IMF and World Bank 2020a). Where secondary bond markets remain shallow and purchases continue to grow, central banks may be subject to political pressure to purchase primary issuance bonds, deepening perceptions of monetary financing of fiscal deficits and further skewing secondary markets.

International synchronization and external conditions. Recent asset purchase announcements in EMDEs took place against the backdrop of a severe global recession. Central banks and governments around the world have implemented unprecedented stimulus in response to the collapse in activity. This synchronization of monetary and fiscal support measures across countries may have increased the effectiveness of these policies.

In the past, reversals of relatively easy global financial conditions when government debt and

fiscal deficits have been elevated have often led to rising risk premia and a pivot to monetary financing of deficits (box 4.1). A similar reversal of investor sentiment in the future, potentially driven by a decline in the volume of advanced economy asset purchases or a broader tightening of global monetary conditions, could once again encourage the use of asset purchases and similar tools to finance fiscal deficits (chapter 1).

Conclusions and policy implications

Since the onset of the COVID-19-induced global recession, some EMDE central banks have announced or implemented asset purchase programs. These appear to have helped stabilize domestic bond and equity markets during a period of heightened financial market volatility and

elevated economic uncertainty. In EMDEs, the announcement of asset purchases appears to have been more effective than announcements of monetary policy rate cuts. The contributions of these policies in reducing bond yields and containing market volatility, however, may prove short-lived and the medium- to long-term effects on output and inflation are uncertain.²² The outlook for continued use of asset purchase programs in EMDEs is also uncertain. If EMDE central banks make asset purchases part of their standard monetary policy toolkit, transparency and program design in line with their mandates of fostering macroeconomic and financial stability can mitigate the risks posed by these programs.

The future of asset purchase programs in EMDEs. Asset purchases have continued to expand in some EMDEs, even as long-term yields have declined and policy rates have remained above the effective lower-bound. Amid the need for greater coordination of fiscal and monetary policies during the COVID-19 pandemic, in an environment of limited conventional policy space and the potential for further market volatility, asset purchase programs may continue to be employed in EMDEs. The experience of advanced economies also raises the possibility that asset purchases will likely continue. Only the Federal Reserve subsequently lowered its stock of asset purchases after the global financial crisis but this policy change lasted less than two years and was eventually reversed. Lessons from the episodes of debt monetization in the 1980s and 1990s also indicate that the asset purchase programs in EMDEs need to be carefully designed to increase their benefits and mitigate the risks.

Key requirements for asset purchase programs to be successful include the following:

Tailored to country-specific contexts and needs. Regarding the choice of assets, sovereign bond purchases in secondary markets are generally preferable; however, such purchases may not be

feasible if these markets lack depth. Standard, marketable debt instruments are preferable to bespoke instruments designed solely for monetary financing of fiscal deficits. Especially in economies with less developed capital markets and lower levels of outstanding local currency debt, the scale of asset purchase programs should be calibrated to reduce the risk of causing market distortion. Extending purchases to lower-quality private sector assets should preferably be avoided because they could increase credit risk for the central bank.

Economies with high participation of foreign investors in government debt markets and less flexible exchange rates may be at greater risk of sharp rises in risk premia if confidence in the prudence of asset purchase programs deteriorate. Where asset purchases constitute a significant share of central bank assets, clearly defined exit strategies that are communicated transparently can ensure that the stance of monetary policy can be adjusted as required and that central bank solvency is not eroded in the event that interest rates rise (IMF 2013; Taylor 2009).

Transparent objectives and operational details. In view of the depth of the current crisis, the perceived benefits of EMDE asset purchase programs, combined with the positive spillovers from simultaneous programs in advanced economies, may, for now, have alleviated some of the concerns about their scope. In many cases, however, asset purchase programs in EMDEs have been less transparent than programs in advanced economies in their objectives, duration, and scale. Addressing these shortcomings would reinforce the counter-inflationary credibility that EMDE central banks have achieved in recent decades, and this may be particularly important if asset purchases are expanded.

Based on credible monetary and fiscal frameworks. Asset purchases have strengthened the fiscal-monetary policy nexus in EMDEs (Carstens 2020). The recent severe deterioration of fiscal positions calls for a policy framework that offers a medium-term plan aimed at the reduction of deficits and stabilization of debt ratios (box 1.1 and chapter 3). Monetary and fiscal policy frameworks that safeguard a degree of separation

²² The empirical results on the effectiveness of asset purchase program announcements are based on regressions and event studies that focus on a narrow time window of 5–7 business days. The results do not provide evidence of longer-lived effects of the announcements.

between fiscal and monetary authorities may alleviate concerns over the monetization of debt and support continued market access for government financing requirements during the recovery. A full and transparent accounting of total public sector debt can increase confidence in debt sustainability (IMF and World Bank 2020b). Better anchored inflation expectations and more flexible exchange rate regimes may reduce the potential costs of asset purchases (Benigno et al. 2020).

Policy coordination. Where there is room for conventional monetary policy actions, their coordination with unconventional monetary policies is needed. While asset purchase programs

appear to have helped restore orderly market functioning following the instability that arose in the context of the initial outbreak of COVID-19, their medium- and long-term effects in EMDEs, and how they compare with those of conventional monetary policies, have yet to be assessed carefully. In the medium term, they may not be successful in either substituting for, or complementing, conventional monetary policy. Monetary policy alone cannot prevent rising concerns over solvency associated with elevated government borrowing yields. Structural, financial, and fiscal reforms are needed to reduce the risk of debt distress in response to the COVID-19 pandemic over the longer-term (chapters 1 and 3).

TABLE 4.1 Main asset purchase announcements in EMDEs in 2020

Country	Month/Day	Primary or secondary market	Bond type	Main announcements
Chile	3/16, 4/1, 4/8	Secondary	Bank	Established a bank bond purchase program for an amount equivalent of up to US\$4 billion. Subsequently extended the program and eliminated the maturity constraints on the eligible instruments.
	6/17			Implemented a special asset purchase program in the amount of US\$16 billion over 6 months.
Colombia	3/23	Secondary	Government, Bank	Authorized the central bank to purchase government bonds (COP 2 trillion) and private instruments (COP 10 trillion) issued by credit institutions with remaining maturities of less than or equal to three years.
Croatia	3/13	Secondary	Government	Started to purchase government bonds with the aim of maintaining stability in the bond market.
Hungary	3/24, 4/7	Secondary	Government, Mortgage	Launched a government securities purchase program on the secondary market, and resumed the mortgage bond purchase program to improve the banking system's access to long-term funds.
	4/28			Announced plans to perform a technical review when stock increases reach HUF 1,000 billion in government securities and HUF 300 billion in mortgage bonds while continuously monitoring asset purchases.
Ghana	5/15	Primary, Secondary	Government	Announced the purchase of government bonds amounting to GHS 5.5 billion, while standing ready to increase its purchases to GHS 10.0 billion.
India	3/20 ^a	Secondary	Government	Announced the purchase of government bonds up to five years in maturity (100 billion INR), and the expansion of maturity of bond purchases up to 9 years (300 billion INR).
	4/23 ^a		Government	Announced plans to conduct bond purchases and sales (100 billion INR) to support market liquidity.
Indonesia	3/2, 4/1, 7/7 ^b	Primary, Secondary (Bank Indonesia 2020c)	Government	Allowed the central bank to purchase government bonds in the primary market and announced the "optimization" of intervention in the secondary market for government bonds. In July, it was announced that the central bank would purchase IDR 397 trillion of primary issuance for public goods funding under the national economic recovery program.
Malaysia	3/25	Secondary	Government	Announced plans to supply liquidity to banks via various tools including the outright purchase of government securities.
Philippines	3/24	Primary, Secondary	Government	Authorized the central bank to purchase securities from the Bureau of Treasury under a repurchase agreement in the amount of PHP 300 billion with a maximum repayment period of 6 months. This was later replaced with a PHP 540 billion repurchase agreement in October. Further purchases of bonds were authorized in the secondary market.

TABLE 4.1 Main asset purchase announcements in EMDEs in 2020 (continued)

Country	Month/Day	Primary or secondary market	Bond type	Main announcements
Poland	3/17	Secondary	Government	Approved the central bank to buy an unspecified amount of government bonds on the secondary market.
	4/8		Government	Broadened the scope of purchases by announcing the central bank would not only buy government bonds but also other bonds with state guarantees (including those issued by the Polish Development Fund and Bank Gospodarstwa Krajowego).
Romania	3/20	Secondary	Government	Announced plans to provide liquidity to banks via repo transactions and purchase local leu-denominated debt on the secondary market to promote market liquidity.
South Africa	3/25	Secondary	Government	Started an unspecified amount of government bond asset purchases.
Thailand	3/20	Secondary	Government	Bought 45 billion baht of bonds and stand ready to continue to buy them to ensure sufficient liquidity.
	4/7		Corporate	Approved a law to allow the BOT to set up a 400-billion baht fund to buy good-quality corporate bonds.
Turkey	3/31, 4/17	Secondary	Government	Commenced the purchase of several billion TRY of Turkish government bonds. Limits of outright purchases were revised to boost liquidity in the government bond market.
Programs excluded from panel and event studies:				
Bolivia	N/A	Secondary	Government	Initially purchased government bonds from pension funds to boost banking system liquidity.
Costa Rica	4/15	Secondary	Government	Authorized the central bank to purchase government bonds on the secondary market up to CRC 250,000 million.
Guatemala	N/A	Primary, Secondary	Government	Congress authorized the central bank to purchase up to 11,000 million GTQ to support fiscal financing requirements in response to COVID-19.
Rwanda	3/18	Primary, Secondary	Government	Offered a 6-month window to purchase government bonds at “prevailing market rate” and reduced the waiting period for the central bank to purchase bonds in the primary market following failed auctions from 15 to 30 days.

Sources: Central bank websites; Arslan, Drehmann, and Hofmann (2020); Hartley and Rebucci (2020); IMF (2020b).

Note: Those economies listed as purchasing in the “secondary” market are not undertaking any primary purchases. In those economies where purchases are to be conducted in the primary and secondary market, all have indicated that one of the purposes of their asset purchase program is to fund fiscal deficits.

a. See Reserve Bank of India (2020a, 2020b) for details of the announcements.

b. See Bank Indonesia (2020a, 2020b) and MoFRol (2020) for details of the announcements.

ANNEX 4.1 Literature on the effects of advanced economy QE programs

TABLE A4.1.1 Literature on the effects of QE programs on bond yields

Literature	Country and program	Findings	Yield impact over 1-7 days (fall)
McLaren, Banerjee, and Latto (2014)	U.K. QE1 and QE2	Gilt yields declined by around 93 basis points with local supply effects (quantity of available bonds) accounting for around half of the fall.	93bps
Gagnon et al. (2011)	U.S. LSAP1	The overall size of the reduction in the ten-year term premium in the range of 30 to 100 basis points, with most estimates in the lower and middle thirds of this range.	30-100bps
Krishnamurthy and Vissing-Jorgensen (2011)	U.S. LSAP 1	QE1 appears to have generated a large impact of QE1 on the yields on these bonds, with effects as high as 160 bps for 10-year agency and Treasury bonds.	160bps
Williams (2014):	Literature review of U.S. and U.K. programs	The central tendency of the estimates indicates that \$600 billion of Federal Reserve's asset purchases lowers the yield on ten-year Treasury notes by around 15 to 25 basis points.	15-25bps for \$600bn of QE, equivalent to LSAP 2 in the United States
Joyce et al. (2011)	U.K. QE1	QE1 in the U.K. may have depressed medium- to long-term government bond yields by about 100 basis points, with the largest part of the impact coming through a portfolio balance effect.	100bps
Christensen and Rudebusche (2012)	U.K. QE1 and U.S. LSAP1	Find that declines in U.S. Treasury yields mainly reflected lower policy expectations, while declines in U.K. yields appeared to reflect reduced term premiums. The existing literature on the response of fixed-income markets to the Federal Reserve's first LSAP program and the Bank of England's QE program suggests a negative effect of between 50 and 100 basis points on 10-year yields	50-100bps

TABLE A4.1.2 Literature on the effects of QE programs on output and inflation

Literature	Country, program and methodology	Inflation impact	Output and employment impact
Weale and Wieladek (2016)	U.S. and U.K. 2008-2014 Structural VAR model	Asset purchases worth 1 percent of nominal GDP, leads to a rise in inflation of 0.58 percent in the United States and 0.32 percent in the U.K.	Asset purchases worth 1 percent of nominal GDP lead to a rise of output of about 0.62 percent in the U.S. and 0.25 percent in the U.K.
Gambacorta, Hofmann, and Peersman (2014)	Panel analysis of Canada, the euro area, Japan, Norway, Sweden, Switzerland, the United Kingdom, and the United States. 2008-2011	Six months after a 3 percent increase in the central banks' assets, the effect on consumer price inflation reach peak effects of 0.01-0.04 percent.	Six months after a 3 percent increase in the central banks' assets, output effects reach a peak of around 0.04-0.10 percent.
Wu and Xia (2016)	U.S. 2009-13	-	Unemployment rate was one percentage point lower than a counterfactual without LSAP1 and LSAP2.
Baumeister, C. and L. Benati (2013)	Effect of QE through term premia compressions in the U.K. and U.S. Estimated using a structural VAR.	Model simulations suggest that in the absence of policy interventions, the U.S. economy would have been in deflation until 2009:Q3 with annualized inflation rates as low as -1 percent. In the United Kingdom, without quantitative easing, annualized inflation would have fallen to -4 percent	U.S. real GDP would have been 0.9 percent lower in the absence of QE, and unemployment would have been 0.75 percentage points higher, reaching a level of about 10.6 percent in 2009:Q4. In the U.K., output growth would have reached a trough of -12 percent at an annual rate in the first quarter of 2009 based on the median of our counterfactual estimates
Kapetanios et al. (2012)	U.K. QE1. Time-varying parameter structural VAR.	QE1 in the U.K. had a peak effect on annual CPI inflation of about 1.25 percentage points.	QE1 in the U.K. had a peak effect on output of about 1.5 percent.
Balatti et al. (2017)	U.S. 1982-2014 and U.K. 1971-2015 VAR model	Insignificant impact on output and inflation.	

ANNEX 4.2 Methodology: Estimation of the impact of asset purchases

This annex describes the panel regression model that is employed to assess the reaction of asset prices following asset purchase announcements in EMDEs.

Model specification. Panel regressions are estimated based on local projections in Jordà (2005).

$$\Delta X_{i,t+h} = \Psi_h(L)Y_{i,t-1} + \beta_h APP_{i,t} + Z_{i,t} + \varepsilon_{i,t+h}, \\ h = 0, 1, 2, \dots \text{ (Baseline model)}$$

where X_t is a dependent variable and Y_t is a vector of explanatory variables that include lags of the dependent variables and policy interest rates at time t . $Z_{i,t}$ represents other control variables including country and time fixed effects. $\Psi_h(L)$ is a polynomial in the lag operator, and APP_t is the dummy variable for the announcement of asset purchase in country i at time t . The coefficient β_h gives the response of X at time $t+h$ to the shock

(announcement) at time t . Thus, the impulse response functions are constructed as a sequence of the β_h s estimated in a series of single regressions for each horizon.

Along with the baseline model, an alternative model is considered where, instead of time fixed effects, dummy variables for conventional monetary policy announcements in EMDEs and for asset purchase announcements in advanced economies are explicitly included. Thus, in this model, the estimated asset purchase announcement effects are estimated controlling for such effects.

$$\Delta X_{i,t+h} = \Psi_h(L)Y_{i,t-1} + \beta_h^{APP} APP_{i,t} + \beta_h^{APPadv} APPadv_t \\ + \beta_h^{IR} IR_{i,t}, h = 0, 1, 2, \dots \text{ (Alternative model)}$$

where IR_t is a dummy for announcements on policy rate cuts in EMDEs and $APPadv_t$ is a dummy for asset purchase announcements in advanced economies. Other notation remains unchanged. Standard errors are clustered by country. The point estimates of coefficients along with their 90 percent confidence intervals are reported.

Data. The sample includes 26 EMDEs, 14 of which have announced the launch or expansion of asset purchase programs on 25 occasions in total between March and July 2020.²³ For dependent variables of the panel regressions, three types of asset prices are considered—local currency long-term (10-year) bond yields, equity price indices and FX rates of local currencies vis-à-vis the U.S. dollar, all at daily frequency. Three models are estimated separately for each financial asset. In addition, the announcements of 34 policy rate cuts in 14 EMDEs between March and July 2020, and the asset purchase announcements by the Federal Reserve, which were occurred on March 23 and April 9, and by the ECB on March 19, were explored as well.

Robustness checks. Time fixed effects or a dummy variable for advanced economy asset purchase announcements is included in the models to control for the impacts of global financial market developments on EMDE asset prices. Several global variables are additionally tested in both types of model to control for external influences. The variables include the Chicago Board Options Exchange Volatility Index (VIX), the EMBIG spread, US 10-year bond yields, US stock price index, US dollar index, and the principal components of 10-year bond yields or equity prices among 30 advanced economies.²⁴ The impact of asset purchase announcements in EMDEs was not materially affected; the differences in the reactions of EMDE long-term bond yields were at most 5 basis points across models, and do not alter any of the findings in the main text.²⁵

²³ Among the 18 EMDEs that announced asset purchase programs, four EMDEs (Bolivia, Costa Rica, Guatemala, and Rwanda) were not included in the study because the announcement date is not clear or daily financial data are not available. The other economies that have not announced asset purchase programs include some large EMDEs, such as Brazil, Mexico, and Russian Federation.

²⁴ See, for example, Ahmed et al. (2020) for the impact of global financial market developments on financial conditions in EMDEs during the COVID-19 global recession.

²⁵ Finally, there were some cases when the announcement dates of asset purchase in EMDEs coincided with those of domestic policy rate cuts or asset purchases in advanced economies. Dropping these cases from the sample resulted in little change to the announcement effects of EMDE asset purchases.

ANNEX 4.3 Event study of asset purchase announcements

As a robustness check of the panel regressions, event studies were performed. These complement the regression analysis by analyzing country-specific announcement effects of asset purchase programs.²⁶ The sample includes 25 asset purchase announcements in 14 EMDEs between March and July 2020. The response of asset prices is assessed in the narrow window of five days around the announcement to ensure that the results are not contaminated by other news.

EMDE asset purchase announcement effects on financial markets. Event study results are consistent with the regression results (figure A4.3.1). Following the asset purchase program announcements, participating EMDEs experienced on average:

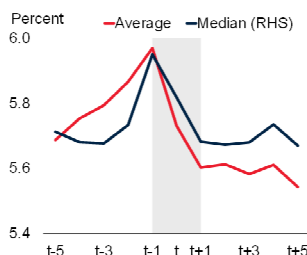
- declines in domestic 10-year bond yields of around 37 basis points within two days and 42 basis points within five days—compared to a negligible decline in the EMDE group that had not implemented asset purchase programs;
- a 2.4 (3.8) percent increase in benchmark equity indices within two (five) days of the announcements, compared to less than 1 percent in the EMDE group that had not implemented asset purchase programs;
- a 0.3 percent currency depreciation against the U.S. dollar within two days but with large variations across countries, and with no significant difference from the depreciations of currencies in EMDEs that had not implemented asset purchase programs;
- a decline in sovereign CDS spreads (5-year) of around 11 (5) basis points within two (five) days, but with large variations across

²⁶ While the panel regressions control for potential confounding factors based on given assumptions, the event studies simply observe the asset price movements around the asset purchase announcements.

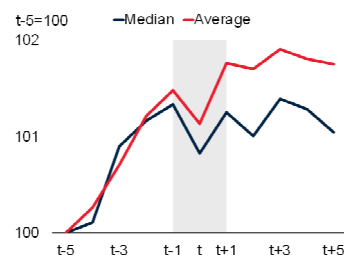
FIGURE A4.3.1 Event study: Asset purchase announcements in EMDEs

The announcements at the launch of asset purchase programs in EMDEs were associated with declines in long-term bond yields and a boost to equity prices. These effects were consistent across most EMDEs although they varied in magnitude. On average, exchange rates did not react to asset purchase announcements.

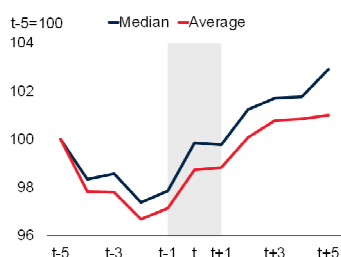
A. Evolution of 10-year bond yields around asset purchase announcements



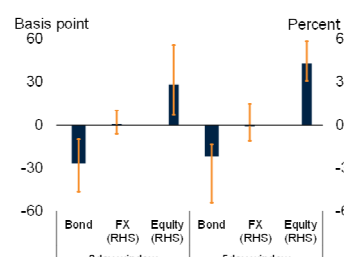
B. Evolution of exchange rates around asset purchase announcements



C. Evolution of equity prices around asset purchase announcements



D. Impact of asset purchases on asset prices



Sources: Haver; National sources; World Bank.

Note: Event studies are based on 25 asset purchase announcements in 14 EMDEs since March 2020.

A.-C. Horizontal axes indicate business days before and after the announcements of asset purchase (shaded area, $t = 0$).

D. Median and interquartile range of changes in bond yields or rate of returns in FX rates per U.S. dollar and sovereign equity index within 2- or 5-day window after the announcements. An increase in the exchange rate denotes an appreciation of the U.S. dollar.

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countries—compared to a negligible decline in the EMDE group that had not implemented asset purchase programs;

- more effective stabilization of domestic financial markets, relative to EMDEs not announcing asset purchase programs.

Cross-country heterogeneity and differences. The effects on long-term bond yields were more pronounced in some EMDEs (Colombia, Ghana, South Africa, Turkey) than in others (India, Indonesia, Malaysia; figure A4.3.2). The effects were more sizeable on equity prices in Colombia, the Philippines, Romania, and Thailand than in other EMDEs. The asset purchase announcements

were followed by currency depreciations in Poland, Romania, and Turkey, whereas currencies appreciated in Hungary, Malaysia, and South Africa.

Heterogeneity may indicate an important role for the scale and scope of asset purchase programs as well as initial conditions. In countries that announced above-average purchase ceilings, the effects on bond yields were 30 basis points larger on average. In Colombia, Hungary, and Thailand—where asset purchase programs targeted bank and non-financial corporate bonds, as well as government bonds—the announcement effects on equity prices were more pronounced. With respect to country-specific features, some EMDEs with higher rates of inflation or larger sovereign credit spreads (Ghana, South Africa, Turkey) had larger announcement effects on bond yields, possibly reflecting the greater rise in the yields before the launch of asset purchase programs. A larger share of foreign ownership in local debt or in stock markets (Hungary, Poland, Romania, South Africa, Thailand) was associated with greater sensitivity of asset prices to asset purchase announcements.²⁷

Comparison with the effects of policy rate cuts and advanced economy asset purchase programs

The reaction of asset prices following EMDE asset purchase announcements are compared with the responses to advanced economy asset purchase announcements, and to conventional monetary policy.

Effects of monetary policy rate cuts in EMDEs. Announcements of policy rate cuts had modest effects on long-term bond yields: following the announcement of policy rate cuts, long-term bond yields declined by 9 basis points, on average, within two business days (14 basis points within a week) (figure A4.3.3).

Effects of asset purchase programs in advanced economies. Announcements of asset purchase

²⁷ For instance, Arslan et al. (2020) argue that larger foreign investor participation in the local currency bond market can increase the effect of the confidence-restoring signaling effect of the asset purchase announcements.

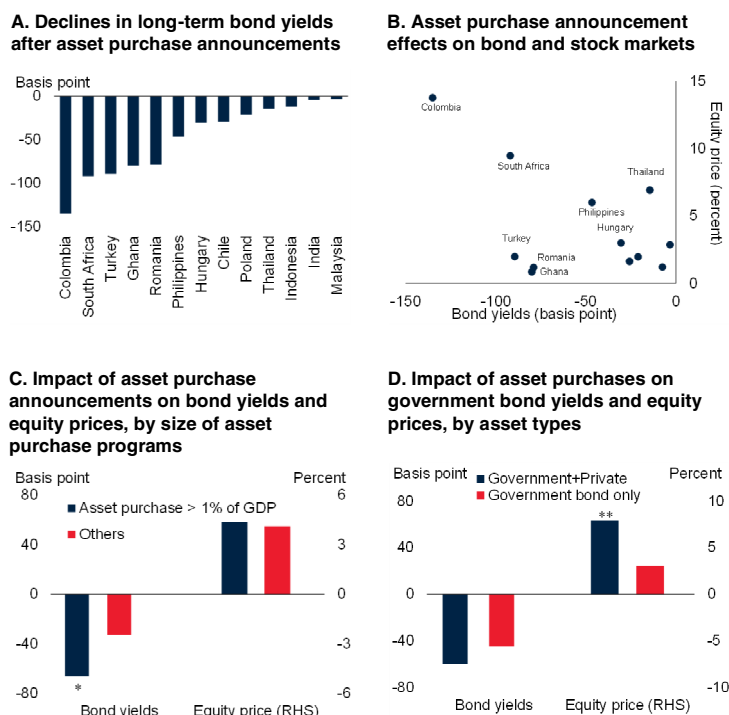
programs by the Federal Reserve and the ECB in 2020 were followed by declines in bond yields that were generally smaller than the domestic responses to EMDE asset purchase programs and previous advanced economy programs. U.S. 10-year bond yields fell by 21 and basis points, respectively, within a day after the Federal Reserve's announcements on March 15 and 23. Following the third announcement, on April 9, US bond yields declined by a further 16 basis points within five days. In response to the announcement of asset purchases by the ECB on March 19, German bond yields fell by 12 basis points over three days while bond yields in France declined by 11 basis points within a day and 26 basis points within three days.

Spillover effects of advanced economy asset purchases to EMDEs. Although the response of asset prices in advanced economies to asset purchases in 2020 was muted relative to responses to earlier programs, there were sizable and relatively persistent spillovers to EMDE asset prices from the announcements by the Federal Reserve and the ECB. The spillovers to EMDE equity prices and exchange rates were actually larger than the impacts of EMDEs' own asset purchase programs on these variables. U.S. announcements had stronger spillover effects on non-EU EMDEs than ECB announcements.

- **U.S. Federal Reserve announcements.** The announcement by the Federal Reserve on March 23 was followed by declines in EMDE bond yields of 44 basis points on average, i.e., virtually the same as for announcements by the countries' own central banks. Within a week of the announcement, EMDE equity prices had risen by 6 percent, and EMDE currencies had appreciated vis-à-vis the US dollar by 1.4 percent. Following the announcement on April 9, EMDE bond yields declined by 27 basis points, equity prices rose by 1.8 percent, and currencies appreciated by 0.5 percent on average.
- **ECB announcements.** In the week following the announcement by the ECB on March 19, government bond yields in EMDEs declined by 7 basis points while equity prices rose by 3.9 percent. In the three EMDEs in the

FIGURE A4.3.2 Event study: Cross-country heterogeneity

The effects of asset purchase announcements were quantitatively different across EMDEs. The heterogeneity may indicate an important role for initial conditions as well as for how the measures were designed. The estimated announcement effects on bond and stock markets were more pronounced in EMDEs with greater program size and where both government and private bonds than others.



Sources: Haver; National sources; World Bank.

Note: Country- or group-specific announcement effects of asset purchase programs in EMDEs on 10-year bond yields (A.-D.) and equity prices (B.-D.). Announcement effects are measured by 2-day cumulative changes in bond yields or equity prices. In EMDEs with multiple asset purchase announcements, asset price changes are averaged across announcements.

C.D. ** and * indicate that the mean of asset purchase programs' impact is different across country groups at the significance level of 5 percent and 10 percent, respectively.

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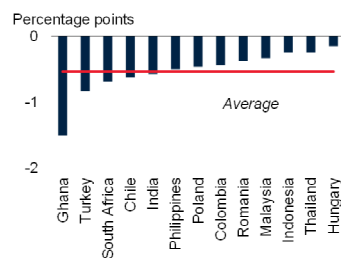
European Union (Hungary, Poland, and Romania), however, the effects of the ECB announcement were more pronounced, reflecting the large cross-border financial linkages. Sovereign bond yields in the three EU EMDEs declined on average by 50 basis points and equity prices increased by 5.6 percent within the week.

Comparison with regression results. The results based on the event studies confirm that the financial market effects of EMDE asset purchase announcements were sizeable. That said, the observed asset price movements were overall larger than the estimates based on the regressions

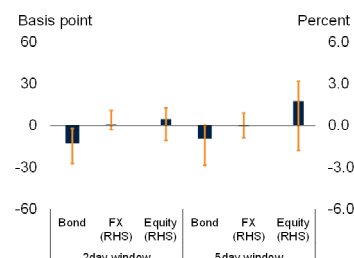
FIGURE A4.3.3 Event study: Policy rate cuts and individual asset purchase effects

Following announcements of policy rate cuts, long-term bond yields in EMDEs declined by around 10 basis points on average, which were smaller than the effects of asset purchase announcements. The effects on equity prices and FX rates were not statistically significant. Asset purchase programs launched by the US Federal Reserve and the European Central Bank were associated with declines in long-term bond yields, boosts to equity prices, and appreciations of currencies in EMDEs. The strength of the effects was comparable to those of domestic asset purchase announcements in EMDEs.

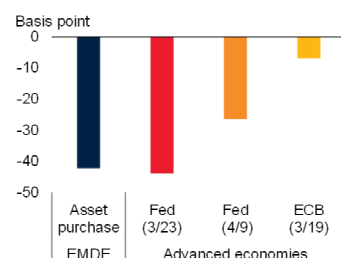
A. Average Policy rate cuts in EMDEs



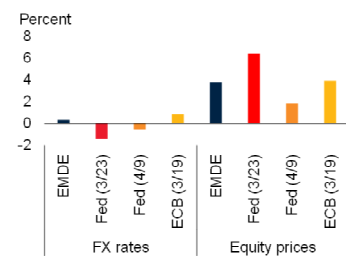
B. Impact of monetary policy rate cuts on asset prices in EMDEs



C. Impact of asset purchases on government bond yields



D. Impact of asset purchases on equity prices and FX rates



Sources: Haver; National sources; World Bank.

Note: EMDE = emerging market and developing economies. Event studies are based on asset price movements in 14 EMDEs, following 34 policy rate cuts EMDEs between March and July 2020 (A.B.), and asset purchase announcements by the U.S. Federal Reserve and the European Central Bank (C.D.). See annex 4.3 for more details.

A. Average policy rate cuts during the sample period.

B. Median and interquartile range of changes in bond yields or rate of returns in FX.

B.D. FX or FX rates indicate foreign exchange rates of EMDE currencies vis-à-vis U.S. dollar. An increase in the exchange rate denotes a depreciation of EMDE currencies.

C.D. Average announcement effects of asset purchases in EMDEs and in advanced economies on 10-year bond yields (C) and equity prices and FX rates (D) in EMDEs. Announcement effects are measured by 5-day cumulative changes in asset prices. FX rates indicate foreign exchange rates of EMDE currencies vis-à-vis U.S. dollar (or euro in the case of event studies on asset purchase announcements by the ECB).

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ANNEX 4.4 Historical case studies of EMDE debt monetization

This annex presents examples of debt monetization episodes in EMDEs in the 1980s and 1990s that were associated with extreme macroeconomic instability, such as high inflation, debt distress, and currency crises. In many of these cases, debt monetization increased following external default or the withdrawal of foreign financing and was accompanied by persistent and large fiscal deficits and high inflation for many years. Five case studies in the 1980s and 1990s are considered (figure A4.4.1). In the Latin American experiences, output losses were substantial. In Turkey, where debt monetization occurred over a shorter horizon and to a lesser degree, output losses were smaller and shorter-lived.

Argentina (1989)

The roots of the Argentinian crisis of 1989 were in the Latin American debt crisis of 1982, when Argentina and several other economies defaulted on foreign loan payments. After the country became locked out of international financial markets, expansion of the monetary base and financial repression were needed to finance large fiscal deficits (Buera and Nicolini 2019). Argentina had already experienced persistently high inflation in the 1970s and early 1980s, accompanied by rapid monetary expansion, leading to weakly anchored inflation expectations. Efforts to tighten monetary policy to control inflation involved higher interest rates, which increased debt-service costs, which were met, in turn, with monetary financing from the central bank. Persistently high inflation, interest rates, and failed fiscal consolidations led output to stagnate during 1980-88. Lost confidence in the ability of the government and central bank to meet debt-service requirements generated sharp capital outflows in 1987-88. Progressively higher interest rate risk premia drove government deficits higher, and continued monetary financing of deficits led to rapidly rising inflation beginning in 1988, accelerating further in 1989, when inflation reached over 3000 percent and output contracted by 7 percent (Beckerman 1992).

presented in the main text. The larger effects revealed by the event studies reflect the fact that other events were also affecting EMDE asset prices that were not controlled for in the event study, but which were controlled for in the regressions. For example, asset purchase announcements by advanced economies seem to have played a critical role. Despite the large scale of policy rate cuts in EMDEs, their impact was weaker than that of their asset purchase announcements.

Bolivia (1985)

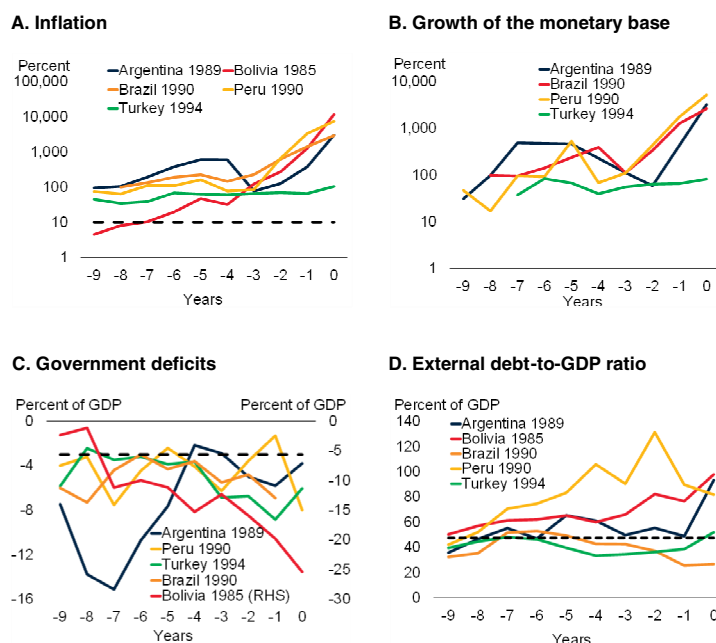
Bolivia received large inflows of foreign credit in the late 1970s. As global interest rates rose and capital flows subsided, a forced devaluation in 1979 exacerbated the external debt burden. In contrast to other Latin American economies facing external financing difficulties, Bolivia continued to meet debt service requirements on much, but not all, of its external debt. Stabilization efforts designed to reign in the public deficit through spending cuts or tax increases failed for political reasons throughout the early 1980s (Sachs 1987). Almost all of the large remaining financing needs of the government were met through additional money creation by the central bank (Kehoe, Machicado, and Peres-Cajias 2019). Tax revenues collapsed alongside rising inflation, falling from 9 percent of GNP in the early 1980s to 1 percent in 1985 (Sachs 1987). Revenues were further hurt by a continuous contraction in output during 1980–85, averaging 1.8 percent a year. Annual inflation exceeded 1000 percent in 1984 and reached nearly 12,000 percent in 1985.

Brazil (1990)

Like Bolivia and Argentina, Brazil was largely cut off from external financing sources after the Mexican default of 1982, following the rise in global interest rates driven by the “Volcker disinflation” that began in 1979. High interest rates initially pushed the public sector deficit to between 6 and 8 percent of GDP during 1980–82 before a stabilization plan reduced it to 3 percent of GDP in 1983. However, the deficit remained high at 4 percent of GDP on average from 1984–8 (Pereira and Nakano 1991). Inflation routinely exceeded 100 percent annually in the early 1980s, and various attempts to control inflation using price controls and by increasing interest rates failed (“the Cruzado Plan,” “Bresser Plan,” and “Summer” plans). Many of these plans attempted to reduce the persistent fiscal deficit but it remained large (Ayres et al. 2018). Increasing risk premia led to rising interest rates which the central bank indirectly financed the government deficit to a large degree through repurchase agreements of government debt. As the monetary base expanded, inflation expectations became further de-anchored and inflation rose to 1,400 percent in 1989,

FIGURE A4.4.1 Characteristics of debt-monetization episodes in EMDEs

In the EMDEs considered in the case studies, inflation and debt monetization peaked after a prolonged period of accelerating inflation and large fiscal deficits, even after repeated consolidation attempts. In many of these cases (as well as in other EMDEs at the time), external debt burdens were high notwithstanding repeated defaults—sudden stops in foreign lending due to defaults or a reversal of capital inflows increased incentives to finance fiscal deficits through central bank money creation.



Sources: Haver; IMF Historical Debt Statistics; Kigal and Liviatan (1995); Pereira and Nakano (1991); Rodriguez (1991); World Bank (World Development Indicators).

Note: Period “0” refers to the year in which the country experienced peak inflation and monetary base expansion, provided in the legend of each chart. Dotted black line reflects average for EMDEs not included in the case studies during 1979–1994 and which did not experience hyperinflation or external default. Comparison economies are not available for monetary base due to data limitations.

A. Argentina uses GDP deflator due to data constraints.

B. Percent growth in base, or “high powered” money issued by the central bank. Data unavailable for Bolivia over the required timeframe. Data interpolated through years in which there was a currency redenomination in Argentina.

C. Fiscal deficit uses IMF Historical Debt Database, supplemented by data from Kigal and Liviatan (1995), Pereira and Nakano (1991), and Rodriguez (1991).

D. External debt, percent of nominal gross national income.

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increasing further to 2,700 percent in 1990. The poor macroeconomic environment led output to stagnate for three years during 1988–90.

Peru (1990)

In the mid-1980s, Peru embarked on a new set of policies designed to boost economic growth following many years of slow expansion and high inflation. As in Argentina and Brazil, Peru had defaulted or fallen into arrears with foreign creditors in the early 1980s, requiring increasing

domestic financing to fund growing government deficits throughout the decade. Inflation was high but controlled, even as deficit financing was increasingly sourced through monetary expansion, through a system of price controls and subsidized government production (Pastor and Wise 1992). However, eventually, fiscal expansion and currency devaluations led to rising price pressures. The link between inflation and the budget deficit reinforced the economy's fiscal weakness, necessitating further debt monetization during the late 1980s; tax revenues fell from 13 percent of GDP in 1985 to just 4 percent in 1989 due to lags in tax collection during periods of rapidly rising inflation and a low degree of tax revenue indexation (Dornbusch, Sturzenegger, and Wolf 1990). Inflation reached over 7,000 percent in 1990, after growing deficits required increasing rates of debt monetization, and output contracted by an average of 9 percent each year during 1988-90 (Martinelli and Vega 2018).

Turkey (1994)

A successful period of export growth and capital account liberalization was halted by a period of strong currency appreciation and rapidly rising labor costs after 1988 (Celasun 1998). Public sector borrowing requirements increased rapidly in this period, peaking in 1993. Initially, financing requirements were partly covered through capital inflows, with the central bank limited to financing 15 percent of the government deficit. However, to stem rising interest costs, the government turned increasingly to monetary financing in 1993, when legal limits were raised. Auctions of domestic debt instruments were canceled to reduce interest rates and replaced with credit from central bank facilities (Ozatay 2000). Inflation reached over 100 percent in 1994 alongside a large currency devaluation, which also coincided with a significant output contraction caused by the crisis. The degree and duration of debt monetization was smaller in the 1994 crisis in Turkey than in the Latin American experiences, and the government was able to continue to service its debts. Although the impact on output was less severe, output contracted by 5 percent in 1994, after an average growth rate of 5 percent in the preceding decade.

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